



# **Environmental Impact Statement (EIS)**

**PROPOSED WIRE GALVANIZING PLANT,  
STEEL MELTING AND HOT ROLLING PLANT,  
PICKLING REVERING GAILVANIZING AND  
COLOUR COATING PLANT IN KAMPALA  
INDUSTRIAL AND BUSINESS PARK,  
NAMANVE**

**DECEMBER 2008**

**CONSULTANCY TEAM**

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## **ACKNOWLEDGMENTS**

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## **LIST OF ACRONYMS**

|      |                                           |
|------|-------------------------------------------|
| ANL  | Acceptable Noise Limits                   |
| CNP  | Construction Noise Permit                 |
| DWD  | Directorate of Water Development          |
| EIA  | Environmental Impact Assessment           |
| EICU | Enviro and Industrial Consult (U) Ltd.    |
| EHS  | Environment, Health and Safety            |
| EMP  | Environmental Management Plan             |
| EIS  | Environmental Impact Statement            |
| ETP  | Effluent Treatment Plant                  |
| NEMA | National Environment Management Authority |
| NEA  | National Environment Act                  |
| OSH  | Occupational Safety and Health            |
| PPE  | Personal Protective Equipment             |
| UIA  | Uganda Investment Authority               |

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## EXECUTIVE SUMMARY

### Project Background

Roofings Limited was established in Uganda in 1994 and has strived to produce the best quality products through meeting the ISO 9001:2000 quality requirements. The company has embarked on constant upgrading to higher technological levels, research and development and expansion of product lines to become one of the largest in the region. The company currently operates from its factory on 38 acres of land at Lubowa on Entebbe road of which 30 000 square metres is covered with factory and warehouses. By 2008, the company has invested over USD 55 million to produce a wide range of products (300 000 tons per annum of steel). It currently employs about 850 people in different departments of the company.

Roofings Limited has been allocated 30 acres of land at Kampala Industrial and Business Park, Namanve at Kkolo-Buwanyi village in Nantabulirwa parish, Goma sub-county of Mukono District where it intends to establish a new division for manufacturing more products. The proposed project will be implemented in three phases:

- Phase One – Wire Galvanising Complex
- Phase Two – Hot Rolling Mill Complex
- Phase Three – Cold Rolling Mill Complex

The site is located in an area that was originally gazetted as a forest reserve and by then it was dominated *Eucalyptus* tree species. The forest no longer exists. Local communities from village are temporarily using part of the site to grow perennial food crops. The local communities are aware that the site will be developed soon, explaining why short term crops are being grown.

### Issues raised by stakeholders about proposed project

- There are graves (6) within the site. Apart from that there are no known archaeological, cultural or historical sites in the project site that will be potentially threatened by the proposed development;
- Some members of the community expressed worry over their protected spring located within the land allocated to Roofings Limited that has been polluted since clearing of the site and levelling of the site began;
- There are no land wrangles between the developer and the stake holders;
- Although they acknowledged that security of the area will improve, there was worry on to whether their right of movement at any given time will not be infringed upon;
- There was fear of noise pollution and water pollution from chemicals emitted by the factory;
- Majority of the residents anticipate employment opportunities during construction and when the factory is operational;
- The community was happy and appreciated the fact that they were being consulted as residents near the industrial site;
- This is a development in the area and its welcome and;
- Community was worried that their children may disappear during construction of the roofing materials industry.

The residents agreed that the development can be implemented and their issues of concern addressed. The main issue of concern is to ensure that their spring is protected or an alternative spring set up so as to ensure they get clean and affordable water. UIA, in collaboration with Roofings Ltd, will relocate the graves and the water source.

### **Socio-economic Impacts**

The factory is within the Industrial Area that is currently not inhabited but there are a few homesteads at the periphery of the proposed site. This means that there will be interaction with people in the project area. The major socio-economic impact is creation of employment as the work place will employ both skilled and unskilled personnel to run the work place. Employment will be during the different phases of implementing the project (mainly construction and operation). Taxes will also be paid to both central and local governments and this will boost the economy of the project area.

### **Positive Social Impacts**

The main positive impacts of the project on social lives of local residents will be possibility of employment and development in the area through multiplier effects of the project. The general social positive impacts of the project shall include:

- Project construction would have beneficial impacts on business and industrial growth in the project area as a whole;
- Construction wages would have a beneficial economic impact in the area;
- While growth can be facilitated by other factors such as market demand, political support and social support, the infrastructure to support economic activity must be in place for planned growth to be realized. Therefore, the construction of Roofings Ltd will contribute to secondary, or indirect, impacts on growth in the project area;
- Appreciation of land values and quicker development in general; and
- Employment during construction;

### **Negative Social Impacts**

There are only a small number of existing homes where proximity effects (such as, noise, air, visual, and traffic) would occur adjacent to the factory during construction and operation. Visual impacts vary depending on the location of homes.

The community access to firewood would have some impacts on distances being increased as the factory would be enclosed. This would have a minimal effect on community character and cohesion. It would not separate residents from public services.

During the construction phase, residents may be disrupted and inconvenienced by dust, noise, heavy equipment traffic on existing roads, changes in the level of service, and safety hazards. Occasionally, there is vibration damage to near-by structures.

The existence of graves and water sources within the project site will require relocation. Roofings is working closely with UIA to effect the relocation without much disruption to social lives of the affected.

On the social economic assessment of the proposed Roofing Uganda Ltd to develop the factory will have more positive impacts than negative impacts of which they can be mitigated.

### Production Impacts

The production process will result in impacts such as clearing of vegetation, increased run-off and soil erosion, noise, accidents and occupational risks, pollution of environmental media (air, water and land) by wastes generated by the production and general changes in topography.

### Mitigation Measures

Adequate mitigation measures for the identified impacts have been suggested in this EIS and Roofings Ltd is committed to implementing the mitigation measures suggested. The benefits of the project will be maximised to ensure that the project area in particular and the country in general develop.

### Environmental Management Plan

The Environmental Management Plan (EMP) describes the range of environmental issues associated with the proposed factory and outlines corresponding management strategies that will be employed to mitigate potential adverse environmental effects. The Environmental Management Plan (EMP) will be implemented during all the phases of project (construction, operation and closure) and the main components of the EMP include:

| Environmental issue                  | Mitigation measures                                                                                                                                                                                                                                | Responsible Party                                                              | Impacted area               | Monitoring Indicators                                                                                                                |
|--------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| Local waterways                      | - Contour storm water drainage<br>- Prevent soil erosion into drainage channels                                                                                                                                                                    | Roofings Ltd<br>DEO (Mukono District)                                          | Drainage channels           | Water quality                                                                                                                        |
| Fuel, grease and oil spillages       | Construction of bunds around equipment<br>Waste oil collected in dedicated drums for proper disposal                                                                                                                                               | Roofings Ltd                                                                   | Water courses               | - Leakages<br>- Oil films on water surfaces                                                                                          |
| Environment, Health and Safety (EHS) | - Implement sound technologies<br>- Provision of personal protective equipment (PPE)<br>- Development of EHS policy<br>- Safety precautions and warnings on equipment in workshops and factory<br>- Training and sensitising workers on EHS issues | - Developer<br>- Workers<br>- DEO<br>- Dept. of Occupational Safety and Health | Workers<br>Company property | - Number of accidents and injuries amongst workers<br>- Levels of absenteeism among workers<br>- Financial loss when accidents occur |

|                                       |                                                                                                                                                                                                                                                             |                                      |                                               |                                                                                                                            |
|---------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|
| Noise                                 | - Restrict noisy activities to day time<br>- Provide PPE against noise<br>- Use modern technology with noise control measures                                                                                                                               | Roofings Ltd                         | Workers<br>Other Residents in Industrial Area | -Complaints from residents and workers<br>- Noise level measurements                                                       |
| Sustainable implementation of project | - Work closely with stakeholders                                                                                                                                                                                                                            | - Local residents<br>- Roofings Ltd  | All stakeholders                              | - Success of project                                                                                                       |
| Management of wastes                  | - In-house controls to reduce wastes<br>- Use of wet cleaning methods in dusty areas and provision of PPE where appropriate<br>- Construction of bunds and containments to control spills into water bodies<br>-Minimise generation of construction wastes. | Roofings Ltd                         | Project area<br>Workers                       | - Water quality in drainage channels<br>- Air quality<br>- Aesthetics of the area                                          |
| Socio-economic programs               | - Monitor progress of community benefits<br>- Sensitisation of communities in project area<br>- Give priority to local residents for some employment opportunities.<br>- Relocate graves and water sources that are currently within the project site       | Residents<br>Roofings Ltd<br><br>UIA | Immediate localities                          | - Records of monitoring programme<br>- Number of local residents employed<br><br>- New location of graves and water points |

### Environmental Monitoring Plan

Environmental monitoring will be part of the overall environmental management plan. The results of the monitoring can form part of the annual audit. The following monitoring indicators shall be used by the developer and/or relevant authorities to evaluate the environmental performance of the factory operations:

- Water pollution, for example, through waste discharges or oil pollution;
- Levels of noise during peak hours of operation
- Training programmes including awareness and capacity building
- PPE provided to the workers
- Periodic (bi-annual) medical assessment of factory staff for occupational exposure

### Conclusion

The developer plans to establish the factory with the main objective of increasing capacity of the current plant at Lubowa and introducing new technology that is not currently available in manufacture of steel products in Uganda.. However, before the development can be carried out, it has to fulfil all the necessary requirement of the laws and regulations of Uganda. The developer has a good plan of implementing the project and it intends to incorporate a number of environmental measures during implementation of the project. NEMA and other relevant authorities need to ensure that the planned activities are executed according to the laws and regulations of the land and the recommendations in this brief implemented.

# 1 INTRODUCTION

## 1.1 Project Background

Roofings Limited was established in Uganda in 1994 and has strived to produce the best quality products through meeting the ISO 9001:2000 quality requirements. The company has embarked on constant upgrading to higher technological levels, research and development and expansion of product lines to become one of the largest in the region. The company currently operates from its factory on 38 acres of land at Lubowa on Entebbe road of which 30 000 square metres is covered with factory and warehouses. By 2008, the company has invested over USD 55 million to produce a wide range of products (300 000 tons per annum of steel) as indicated in Plate 1.1. It currently employs about 850 people in different departments of the company.



**Plate 1.1: Products from Roofings Ltd at Lubowa factory**

Roofings Limited has been allocated 30 acres of land at Kampala Industrial and Business Park, Namanve where it intends to establish a new division for manufacturing more products. The proposed project will be implemented in three phases (details in section 4.0):

- Phase One – Wire Galvanising Complex
- Phase Two – Hot Rolling Mill Complex
- Phase Three – Cold Rolling Mill Complex

## **1.2 Terms of Reference**

The issues covered in this EIS were identified during the environmental scoping exercise and they were used in preparing Terms of Reference for carrying out the EIA that were submitted to NEMA on 17 November 2008 and approved on 9 December 2008 (Annex 1).

## **1.3 The Assessment Process**

During the environmental impact assessment, constant reference was made to the National Environment Act, the Water Act, the EIA Regulations (1998), Effluent Discharge Regulations (1999), Noise Control Regulations (2003) and the Land Act Cap. 227. The environmental scoping exercise was conducted to identify key issues of environmental concern from which Terms of Reference were prepared and submitted to NEMA for approval.

Following a scoping exercise, a detailed assessment to ascertain the extent of the identified environmental problems with a view to enhancing the positive aspects while finding ways to address and mitigate the adverse impacts was carried out. In this regard, the EIA process was conducted to examine, analyse and assess the proposed development with a view to ensuring that it will be environmentally sound and sustainable.

The EIA team used various methods to identify key significant environmental issues and assess the potential impacts of the proposed project on the environment. These included discussions with management of Roofings Ltd., NEMA, Uganda Investment Authority and local residents; preliminary baseline studies, physical inspection of the factory at Lubowa and project site and area, study team observations and public consultations.

### **1.3.1 Discussions with Management**

Initial meetings were carried out with management of Roofings Ltd to discuss the scope of the EIA, the objectives of the study and any issues that were to be addressed during the assessment process. The EIA team also conducted a site visit during the environmental scoping exercise and pertinent issues were discussed with project management at project site.

### **1.3.2 Physical inspection of the site**

During the assessment process, the proposed project site and its surroundings were inspected. A guided tour was conducted during which the EIA study team carried out an environmental scoping exercise around the project site. Screening criteria used favoured the project site that is the subject of EIA study in this EIS.

### **1.3.3 Review of Literature and Records**

The study team reviewed available literature and records about the project in order to obtain any information applicable to the EIA process. This information also assisted identifying stakeholders to be consulted.

As part of the framework for the assessment, the EIA team reviewed applicable Ugandan environmental, planning, industrial, labour, and health and safety legislation and guidelines. The review of Ugandan legislation revealed that the applicable legislation to the proposed project mainly focuses on issues of:

- Environmental impact assessment
- Solid waste handling
- Wastewater disposal and standards for discharge
- Occupational Health and Safety
- Public health.

### 1.3.4 Consultations with Stakeholders

A number of public consultations were initiated by the EIA team to ensure that the concerns of stakeholders and interested parties are taken into consideration. During these meetings, the different stakeholders expressed their opinions and recommendations on how the project could be successfully managed with minimum impacts to the environment and the residents in the project area and those neighbouring the project site. Meetings and consultations were held with residents and local leaders in the project area. The various offices and individuals consulted during the study are listed in Annex 2.

### 1.3.5 Baseline Studies

Studies were carried out to obtain data on biophysical indicators and socio-economic conditions of the project area. The detailed results of the baseline studies are presented in Section 3.0 of this EIS.

Some key issues of relevance to this assessment include the following:

- The true and total costs of environmental pollution are to be borne by the polluter (*The National Environment Act*, Section 3. (2) (k)).
- Everyone has the duty to maintain the environment, and to inform NEMA of activities that may affect the environment significantly (*The National Environment Act*, Section 4. (2)).
- Waste should be sorted according to hazardous and nonhazardous in accordance with methods set out by NEMA (*The National Environment (Waste Management) Regulations*, 1999, Regulation 4. (4)).
- It is the responsibility of an employer to take, as far as reasonably practicable, all measures for the protection of his or her workers and the general public from dangerous aspects of the employer's undertaking at his or her own cost (*Occupational Safety and Health Act*, 2006, Section 13 (1))

## 1.4 EIA Team

The EIA study team included the following certified and registered Environmental Practitioners:

| Name                   | Position on Team                          |
|------------------------|-------------------------------------------|
| Dr. Patrick Mwesigye   | Team Leader                               |
| Dr. Charles Koojo      | Environmental Planner/Socio-economist     |
| Mr. Edgar Mugisha      | Waste Management Specialist               |
| Dr. Frank Kansiime     | Ecologist                                 |
| Dr. Deogratius Sekimpi | Occupational Health and Safety Specialist |

## **2 POLICY AND LEGAL FRAME WORK**

There are a number of legislations that deal with environmental management in Uganda both in general and specific terms, the most important of which is the Constitution of the Republic of Uganda (1995). The specific legislations that deal with environmental assessments are the National Environmental Act, Cap 153 and its subsidiary, the Environmental Impact Assessment Regulations (1998). In this section, the various laws and regulations that are designed to assist in management of environment in Uganda are briefly described.

### **2.1 The Uganda Constitution 1995**

In the Uganda Constitution of 1995, Article 39 and 41 provide that everyone has a duty to maintain a sound environment. Chapter Three, section 245 stipulates that parliament shall by law provide measures intended to protect and preserve the environment from abuse, pollution and degradation.

### **2.2 National Environment Act, Cap. 153.**

Following the enactment of the National Environment Act (NEA) Cap. 153, the National Environment Management Authority (NEMA) was created and charged with the responsibility to oversee, coordinate and supervise environmental management in Uganda.

The National Environment Act stipulates that an environmental impact assessment be undertaken by the developer where the lead agency, in consultation with NEMA, is of the view that the project:

- may have an impact on the environment,
- is likely to have a significant impact on the environment; or
- will have a significant impact on the environment".

According to Third schedule of the National Environment Act Cap. 153, any development that involves processing and manufacturing is subjected to an EIA which may be in the form of a project brief and if found necessary a detailed EIA. This EIS has been prepared in accordance with the EIA Guidelines (1997) and the EIA Regulations (1998) for Uganda as provided by NEMA. Under sub-regulation (1) of regulation 37 of the EIA Regulations (1998), fees are payable for approval of environmental impact statements and the amounts are prescribed in Schedule Three of the regulations (Annex 3).

Part V (I) of the same Act further provides for environmental standards. They include standards for air quality, water quality, discharge of effluent into water, control of noise and soil quality. The relevant regulations that have been developed under Section 108 of the NEA include the Environmental Impact Regulations (1998); National Environment (Waste Management) Regulations (1999) and Control of Noise Pollution Regulations (2003).

The National Environment (Waste Management) Regulations (1999) also directly mentions the application of cleaner production as a means to minimise production of wastes. Regulation 5 (1) states that: A person who owns or controls a facility or premises, which generate waste, shall minimise the waste generated by adopting the following cleaner production methods:

- (a) Improvement of production processes through:
  - (i) Conserving raw materials and energy;
  - (ii) Eliminating the use of toxic raw materials;
  - (iii) Reducing toxic emissions and wastes
- (b) Monitoring the product cycle from beginning to end by –
  - i. Identifying and eliminating potential negative impacts of the product;
  - ii. Enabling the recovery and reuse of the product where possible;
  - iii. Reclamation and recycling;
- c) Incorporating environmental concerns in the design and disposal of a product.

The Executive Director of NEMA may, from time to time, give directions in writing to any person or class of persons, requiring applying specifically stated methods of cleaner production to achieve the goals of cleaner production stated in the directive. The proposed project is a good candidate for implementation of cleaner production.

### **2.3 The Water Act Cap. 152**

The Act provides for the management of water in Uganda and is under the mandate of the Ministry of Water and Environment. Section 31, subsection (1) of the Water Act deals with prohibition of pollution to water and stipulates that a person commits an offence who, unless authorised under this Act, causes or allows:

- Waste to come into contact with any water;
- Waste to be discharged directly or indirectly into water;
- Water to be polluted

According to Regulation 4 (1) of the Water (Waste Discharge) Regulations (1998): No person shall discharge effluent or waste on land or into aquatic environment contrary to the standards established under section 27 of the National Environment Act, that is, The National Environment (Standards for Discharge of Effluent into Water or on Land) Regulations (1999); unless he or she has a permit in the format specified in the format specified in the First Schedule issued by Directorate of Water Development (DWD).

### **2.4 Occupation Safety and Health Act, 2006**

The Occupational Safety and Health Act (OSHA) replaces the Factories Act (1964). It departs from the original listing of ‘don’ts’ and now has a new scientific approach in which the technical measures required in the protection of workers are spelled out to be put in place. In so doing it is preventive in approach.

The Act provides for the prevention and protection of persons at all workplaces from injuries, diseases, death and damage to property. The OSH Act covers not just the ‘factory’ but also any workplace where persons are employed and its provisions extend not just to employees but to the self employed and any other persons that may be legitimately present in the workplace who may be exposed to injury or disease.

Employers must provide for the protection of workers from adverse weather, provision of a clean and healthy work environment, sanitary conveniences, washing facilities, First Aid and facilities for meals. The Act provides for safe access to the workplaces and safe work practices.

Section 54 of the OSHA states: Every employer shall provide and maintain adequate facilities for taking meals, due regard being made to the number of workers who remain on the premises during meal times. The facilities for meals shall be situated away from habitual work positions and shall include tables and chairs or benches with back rests.

Section 55 of the OSHA stipulates that there shall be provided so as to be readily accessible a first aid box or cupboard of the prescribed standard, and where more than one hundred and fifty persons are employed, an additional box or cupboard for every additional one hundred and fifty persons.

For purposes of this section, the number of persons employed in the work place shall be taken to be the largest number of persons employed therein at any one time, and any fraction of one hundred and fifty shall be reckoned as one hundred and fifty. Where the persons employed are employed in shifts, the calculation of the number employed shall be according to the largest number at work at any one time.

Section 96 of the OSH Act states: For hazardous chemicals, chemical safety data sheets containing detailed essential information, regarding the identity, supplier and classification of the chemical, and the hazards, safety precautions and emergency procedures required for chemicals shall be provided to an employee, by a manufacturer or importer of the chemical.

Section 91 of the OSHA states that: Where any process carried out at a work place is likely to cause bodily injury which cannot be prevented by other means, every worker involved in that process, who is liable to bodily injury, shall be provided with suitable and appropriate personal protective equipment and clothing to protect him or her from risks or injury. The employer shall supply and maintain personal protective equipment free of charge to the employees and provide instructions for their use.

Section 92 of the OSH Act states that:

- In the case of any of the processes specified in the Schedule 8, suitable goggles or effective screens shall be provided to protect the eyes of the persons employed in the process.
- In any work place where electric arc welding is carried on in a manner as to involve risk of persons employed (other than persons employed in the welding process), being exposed to the electric arc flash, effective provision shall be made, be screening or otherwise, to prevent such exposure.

## **2.5 Public Health Act, Cap. 281**

Section 7 of the Act provides local authorities (in this case, Mukono District) with administrative powers to take all lawful, necessary and reasonable practicable measures for

preventing the occurrence of, or for dealing with any outbreak or prevalence of, any infectious communicable or preventable disease to safeguard and promote the public health and to exercise the powers and perform the duties in respect of public health conferred or imposed by this act or any other law.

Section 103 of the Public Health Act, Cap. 281 imposes a duty on the local authority to take measures to prevent any pollution dangerous to the health of any water supply that the public has a right to use for drinking or domestic purposes.

The Act details the siting of waste disposal facilities such as effluent treatment plants in relation to settlements, water supply points and food points.

## **2.6 The Land Act, Cap. 227**

Section 43 states that a person who owns or occupies land shall manage and utilise the land in accordance with the National Forestry and Tree Planting Act, the Mining Act, the National Environment Act, the Water Act, the Uganda Wildlife Act and any other law. In Section 45, any use of the land shall conform to the provisions of the Town and Country Planning Act and any other law.

Section 70 of the Land Act states that:

(1) Subject to section 44, all rights in the water of any natural spring, river, stream, watercourse, pond, or lake on or under land, whether alienated or unalienated, shall be reserved to the Government; and no such water shall be obstructed, dammed, diverted, polluted or otherwise interfered with, directly or indirectly, except in pursuance of permission in writing granted by the Minister responsible for water or natural resources in accordance with the Water Act.

(2) Nothing in this section shall prevent the reasonable use by an occupier of land of any waters referred to in subsection (1) for domestic, small-scale agricultural or pastoral purposes.

## **2.7 The Investment Code (1991)**

Section 19 of the Investment Code stipulates that an investment licence may also contain an understanding by the investor to take steps to ensure that the operations of his/her business do not cause injury to the ecology or environment.

## **2.8 Town and Country Planning Act, Cap. 30**

The Town and Country Planning Act stipulates that for any development out of character with its surroundings, the Town and Country Planning Board shall give special permission for change of user (rezoning). The proposed development is in an area currently zoned as industrial and therefore no change of user permission is required.

## **2.9 Labour Laws**

Labour laws relevant to employment, industrial relations and workers' conditions are set out in the Employment Act (2006), Workers' Compensation Act (2000), the Labour Unions Act (2006) and Labour Disputes (Arbitration and Settlement) Act (2006). The relevant sections of the labour laws and regulations address such matters as:

- Appointment of Inspectors;
- General Duties, Obligations and Responsibilities of Employees;
- General Duties of Employers and Self-Employed;
- Registration of Workplaces;
- Health and Welfare;
- General Safety Requirements;
- Fire Preparedness;
- Handling of hazardous materials;
- Machinery, Plant and Equipment;
- Occupational Diseases;
- First-Aid;
- Dispute Resolutions and Settlement;
- Collective Agreements; and,
- Registration of Labour Unions.

### 3 ENVIRONMENTAL BASELINE STATUS OF THE PROJECT AREA

#### 3.1 Project site location

The site is located at Kkolo-Buwanyi village in Nantabulirwa parish, Goma sub-county of Mukono District. The area is part of Namanve Industrial Park.

#### 3.2 Topography

The upper (northern) part of the project site borders a Kampala-Jinja railway line. There are some residential houses on the upper part of the railway line. Downward from the railway line, there is gentle hill that connects to a valley which finally drains into Lake Victoria (Plate 3.1).

#### 3.3 Land use

The site is located in an area that was originally gazetted as a forest reserve and by then it was dominated *Eucalyptus* tree species. The forest no longer exists. Local communities from village are temporarily using part of the site to grow perennial food crops. The local communities are aware that the site will be developed soon, explaining why short term crops are being grown.

#### 3.4 Ecological Investigations

Field visits were undertaken to identify and assess ecological issues and constraints related to the project. The visits involved moving in and around the proposed project site to make physical observations of fauna and flora and any other ecological aspect that is likely to be impacted by the proposed project. Plants samples that could not be identified in the field were collected and taken to Makerere University Herbarium for identification. A water sample was also taken for water quality assessment. Local communities were also consulted through interviews. Through filed surveys, assessment and measurements the following were carried out; the ecological status of the project site, including ecological resources and values of sensitive/endangered resources found at the project site. During the assessment, the team considered the need to conserve and sustainably manage sensitive/endangered ecological resources.

At the beginning of the valley, there is a protected water spring where the local communities collect water for domestic purposes (Plates 3.2 and 3.3).

##### 3.4.1 Flora

As earlier pointed out, the land at the project site has been modified by agricultural activities and there are no eucalyptus trees at the project site. The flora existing in the area is documented below.

##### 3.4.2 Grasses

The dominant grass species that were identified during the field survey include; *Imperata cylindrica*, *Digitaria scalarum*, *Panicum maximum*, *Pennisetum sp.* *Hyparrhenia sp.*; *Cynodon dactylon*; *Cyperus alba*, *Cyperus rotundus* and *Leersia hexandra*.



Plate 3.1: An overview of the project site towards a valley



Plate 3.2: Gentle slope towards a water source used by local communities



Plate 3.3: Protected spring used as a water source by local communities

### 3.4.3 Herbs and Shrubs

The herbs and shrubs at the project site include;

*Lantana camara*, *Lantana trifolia*, *Acanthus pubescens*, *Erlangia tormentosa*, *Crotalaria brevidens*, *Cassia kirkii*, *Urena lobata*, *Tragia benthamii*, *Acalypha bipartita*, *Cyphostemma nieriense*, *Momorica foetida*, *Desodium totuosum*, *Vernonia auriculifera*, *Vernonia amygdalena*, *Centella asiatica*, *Argeratum conyzoides*, *Galinsoga parviflora*, *Bidens pilosa*, *Microglossa angolensis*, *Conyza floribunda*, *Aspilla sp*, *Crassocephalum vitellinum* and *Leonotis nepetifolia*.

### 3.4.4 Food Crops

The food crops currently being grown in the project area include;

Sweet potatoes (*Ipomea batata*); Cassava (*Manihot esculenta*); Coco-yams (*Colocasia esculenta*), Bananas (*Musa sp.*); Maize (*Zea mais*); Beans (*Phaeseolus vulgaris*).

### 3.4.5 Trees

The tree species at the project site include;

*Antiaris toxicaria*, *Phoenix reclinata*, *Albizia grandibracteata*, *Erythrina abyssinica*, *Spathodea companurata*, *Ficus exasperate*, *Markhamia lutea*, *Albizia coriaria*, *Pseudospondias microcarpa*, *Ficus ovata*, *Artocarpus heterophyllum* and *Carica papaya*.

### 3.4.6 Fauna

The animal species that were observed at the project site are were mainly White egret birds. None of the above mentioned flora and fauna is classified as endangered.

## 3.5 Water Resources

There is a water source at the southern end of the project site (Plate 3). The water source is used by local communities for domestic purposes. It was reported that this is the only nearest water source serving the communities north to the project site. A water sample was collected from the site and analysed for water quality parameters at NWSC and the results are depicted in Plate 3.4. The water is not of good quality and does not meet the drinking water quality standards as it contains faecal coliforms. UIA, in collaboration with Roofings Ltd, is relocating the water source that will have better quality.



# NATIONAL WATER AND SEWERAGE CORPORATION

CENTRAL LABORATORY - BUGOLOBI

P.O.BOX 7053 KAMPALA.

Tel: 257548, 341144. Fax: 256 41 255441

E-Mail: waterquality@nWSC.co.ug

## CERTIFICATE OF ANALYSIS

CLIENT: Roofings Limited

Serial No: ES/RF/225

Sample Source: Spring Water

Sampled by: Staff-NWSC

Date Sample Received: 18-08-2008

Date of Report: 03-09-2008

Table of Analytical Results

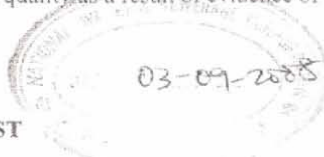
| Parameters                             | Units     | Spring Wample | National Standards for potable water. |
|----------------------------------------|-----------|---------------|---------------------------------------|
| WS Sample Nr                           | --        | C-0213        |                                       |
| pH                                     | --        | 5.78          | 6.5 – 8.5                             |
| Electrical Conductivity (EC)           | µS/cm     | 99.4          | 1000                                  |
| Colour: apparent                       | PtCo      | 33            | 15                                    |
| Turbidity                              | NTU       | 4.6           | 5.0                                   |
| Total Dissolved Solids (TDS)           | mg/L      | 63            | 700                                   |
| Total Suspended Solids (TSS)           | mg/L      | 1             | 0.0                                   |
| Alkalinity: total as CaCO <sub>3</sub> | mg/L      | 36            | 500                                   |
| Hardness: total as CaCO <sub>3</sub>   | mg/L      | 34            | 500                                   |
| Iron: total                            | mg/L      | 0.08          | <0.30                                 |
| Orthophosphate                         | mg/L      | 0.02          | 2.0                                   |
| Nitrate                                | mg/L      | 0.01          | 5.0                                   |
| Total Phosphorus (TP)                  | mg/L      | 0.19          | 5.0                                   |
| Total Nitrogen (TN)                    | mg/L      | 0.60          | 10.0                                  |
| BOD                                    | mg/L      | 1.3           | Not Specified                         |
| COD                                    | mg/L      | 6             | Not Specified                         |
| Fat, Oil & Grease (FOG)                | mg/L      | 0.00          | 0.0                                   |
| Cadmium                                | mg/L      | <0.001        | 0.001                                 |
| Copper: Cu                             | mg/L      | <0.001        | 1.00                                  |
| Lead: Pb                               | mg/L      | <0.001        | 0.05                                  |
| Zinc: Zn                               | mg/L      | <0.001        | 5.00                                  |
| Faecal Coliforms                       | CFU/100mL | 4             | 0                                     |

&lt;0.001 = Below Detection Limit

### Remarks:

The sample showed satisfactory physical-chemical characteristics of the water source but with doubtful bacteriological quality as a result of evidence of recent faecal contamination of the source.

Lance E. Okwerede  
PRINCIPAL ANALYST



Christopher Kanyesigye  
QUALITY ASSURANCE MANAGER

NB: The NWSC certificate of analysis by no means constitutes a permit to any person or undertaking to conduct business.

1

**Plate 3.4: Water Quality Analysis Results for well within the project site**

### 3.6 Wind Flow

#### 3.6.1 Introduction

Air pollution can be defined as “presence in the atmosphere of contaminants in such a quantity and duration as to be harmful to human and animal health, plant life and materials”.

The effects of air pollutants on the environment are dependent on their concentration in the atmosphere in addition to their physical and chemical characteristics. The concentration levels are in turn dependent on the emission rates, and atmospheric conditions such as wind speed, atmospheric stability and other atmospheric processes such as chemical and photo-chemical reactions and deposition rates.

For a fully suspended non-reactive pollutant, the emission strength, wind speed and atmospheric stability are the most important factors that determine its atmospheric concentration. The concentration decreases with distance approximately in accordance with the Gaussian diffusion process. However for chemically or photo-chemically active pollutants, the concentration must be allowed to decay as a function of the rate of reaction which can generally be regarded as constant over the distance where atmospheric conditions remain unchanged.

Assessment of Air Pollution poses a problem where the surface is uneven. The problem becomes more complex when the source of pollution is very far from the point of wind measurement. However in a situation where the intervening distance between point of measurement and pollution source is characterized by fairly flat terrain and few structures, the wind measurement may be a fairly good representation of the wind field.

Regarding atmospheric stability, diurnal variation of the surface based inversions associated with radiative surface cooling at night and thermal convection after sunrise can result in high concentration levels of pollutants in the early morning periods.

#### 3.6.2 Atmospheric Processes Affecting Air Pollution

##### 3.6.2.1 Wind field

Wind speed determines the rate of transportation of air pollutants downwind from the source and at the same time participates in their dispersion process. Wind direction on the other hand determines the direction of pollution transportation and thereby the areas of its impact.

##### 3.6.2.2 Atmospheric stability

Atmospheric stability determines the lateral and vertical dispersion of air pollutants. It is a function of vertical thermal structure and wind speed. An existing temperature inversion can seriously limit the vertical dispersion resulting in high pollutant concentrations.

For a short time dispersion process, the Gaussian diffusion formula can be applied:

$$C(X, Y, Z; h) = \frac{Q}{2\pi\sigma_y\sigma_z u} \exp\left(-\frac{1/2 y^2}{\sigma_y^2}\right) \exp\left(-\frac{1/2 (z-h)^2}{\sigma_z^2}\right) + \exp\left(-\frac{1/2 (z+y)^2}{\sigma_z^2}\right)$$

Where:  $C(X,Y,Z;h)$  = Concentration

$Q$  = Emission Rate

$\sigma$  = Standard Deviation

$u$  = Mean Transport Wind

When a temperature inversion is present, the concentration from a point source can be estimated as follows:

$$C(X,Y,Z;h) = \frac{Q}{2\pi\sigma_y u L} \exp\left(-\frac{1}{2} \frac{y^2}{\sigma_y^2}\right)$$

Where:  $L$  = depth of mixing layer below the inversion base.

### 3.6.2.3 Dry deposition

The particulate pollutants with large diameters will settle to the ground with a constant settling velocity determined by their sizes:

$$V_s = \frac{2\rho g r^2}{9\mu}$$

Where:  $\rho$  = Particle density

$r$  = Particle radius

$\mu$  = Coefficient of viscosity

The deposition rates are dependent on ground level concentration and settling velocity:

$$D(x,y) = C(x,y,0;h) \cdot V_s$$

### 3.6.2.4 Wet deposition

Precipitation scavenging of air pollutants can be effective in cleaning the atmosphere while at the same time can result in serious impacts on both terrestrial and aquatic ecosystems through acidification of soil, surface water, injury to plant tissue and corrosion of materials.

### 3.6.2.5 Long term air pollution estimates

The long term impacts of air pollution can be assessed by use of climatology of the meteorological parameters that influence the long term atmospheric concentrations, the main ones being the wind field and atmospheric stability.

### 3.6.3 Wind field in Kampala

The nearest station to Namanve with wind data is Kampala (Kololo). This wind regime can be taken to be representative of the study area. Wind analysis for Kololo indicates that winds are stronger in the afternoon as can be seen from Table 3.1.

**Table 3.1: Monthly average wind speed at Kololo Meteorological Station**STATION NAME: KAMPALA - STATIONLATITUDE 00°20'N

LONGITUDE

32°36'E

| LONG TERM MEANS |        | RELATIVE HUMIDITY |        |         | WIND SPEED     |                | Calms  |        |
|-----------------|--------|-------------------|--------|---------|----------------|----------------|--------|--------|
|                 |        | 6.00A.M           | 9.00AM | 3.00P.M |                |                |        |        |
|                 |        |                   |        |         |                |                |        |        |
| 30 yrs          | Month  | %                 | %      | %       | Knots(09:00am) | Knots(03:00pm) | (days) | (days) |
|                 | JAN    | 83                | 78     | 53      | 7              | 12             | 2      | 0      |
|                 | FEB    | 84                | 80     | 55      | 6              | 13             | 2      | 1      |
|                 | MARC   | 91                | 82     | 60      | 7              | 12             | 1      | 0      |
|                 | APR    | 92                | 88     | 69      | 7              | 11             | 3      | 1      |
|                 | MAY    | 92                | 89     | 71      | 7              | 12             | 2      | 1      |
|                 | JUN    | 91                | 87     | 68      | 7              | 13             | 2      | 1      |
|                 | JUL    | 89                | 89     | 66      | 8              | 12             | 3      | 2      |
|                 | AUG    | 92                | 89     | 66      | 8              | 11             | 2      | 1      |
|                 | SEPT   | 93                | 87     | 65      | 8              | 11             | 2      | 1      |
|                 | OCT    | 91                | 83     | 63      | 7              | 10             | 2      | 1      |
|                 | NOV    | 86                | 81     | 61      | 6              | 10             | 2      | 1      |
|                 | DEC    | 87                | 81     | 60      | 7              | 11             | 2      | 1      |
|                 | ANNUAL | 89                | 85     | 63      | 8              | 11             | 25     | 11     |

DATA SOURCE  
DEPARTMENT OF METEOROLOGY  
P.O.BOX 7025 KAMPALA



Plate 3.5 shows that the winds at Kololo Meteorological Station are mainly southerlies throughout the year.

### 3.6.4 Optimum Design of Stack

Meteorological data are necessary for effective design of industrial stacks. The meteorological parameters that are required for designing the height of an industrial stack are mean wind speed, air temperature and pressure.

Nearby structures can also cause mechanical turbulence which may bring the plume to ground level, especially when the stack is downwind of the structure and the wind speeds are high. To avoid this problem, stacks should usually be designed 2 to 2½ times the height of the nearby structures.

When the air pollutants are emitted from a stack, they rise above the stack before levelling out. The effective stack height (H), therefore, is not only the physical height of the stack (h) but includes the plume rise ( $\Delta h$ ),

$$H = h + \Delta h$$

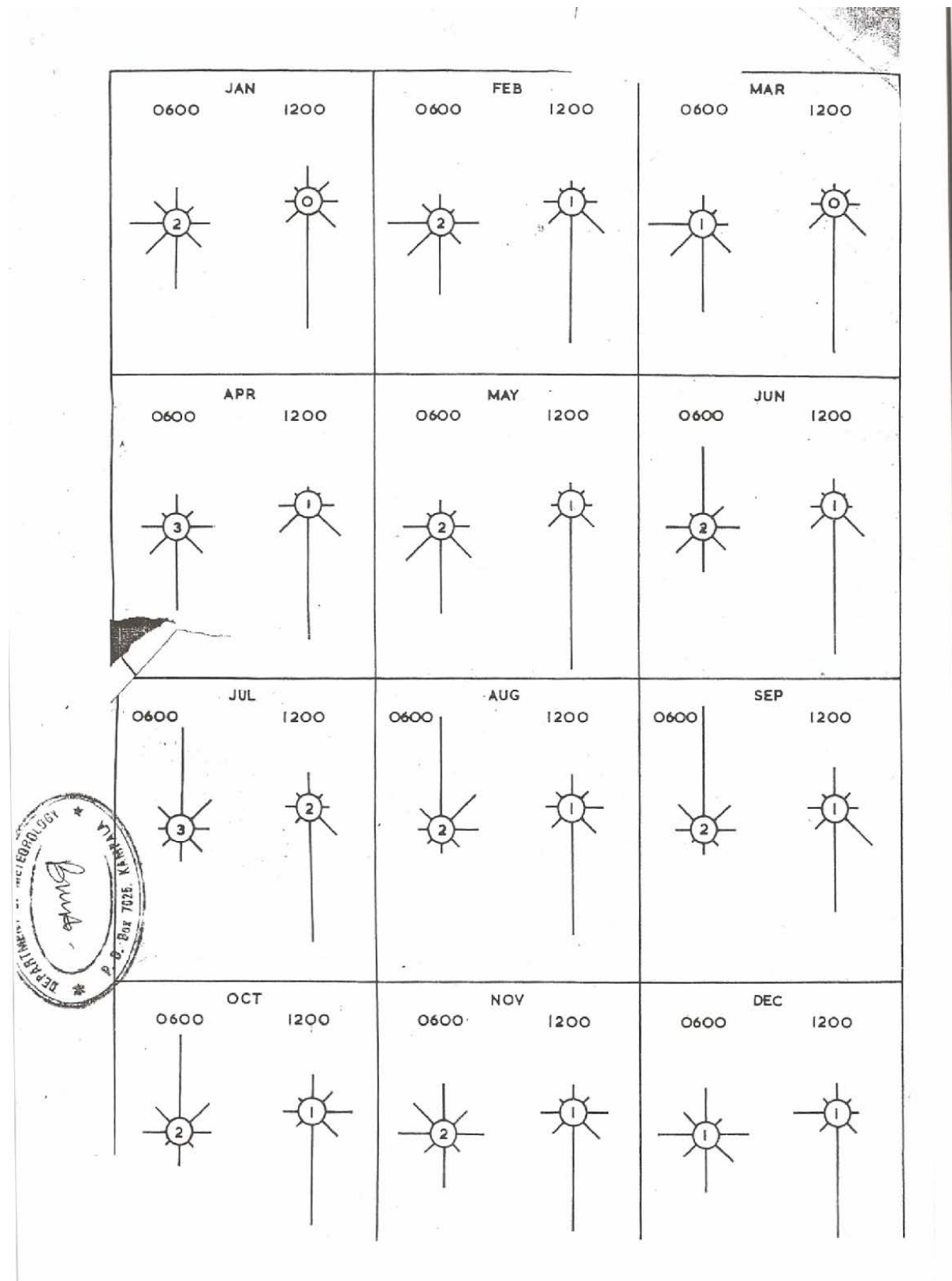


**Plate 3.5: Average wind direction at Kololo Meteorological Station.**

Stack heights used in calculations should be the effective stack height (H), and there are numerous ways of determining  $\Delta h$ . One of the equations used for the determination of plume height is:

$$\Delta h = \frac{V_s d}{u} \left( 1.5 + (2.68 \times 10^{-3} p \frac{\Delta T d}{T_s}) \right)$$

Where:  $\Delta h$  = rise of plume above stack in m

$V_s$  = Stack gas velocity in m/s

$d$  = inside stack diameter in m

$u$  = wind speed in m/s

$p$  = atmospheric pressure in millibars

$\Delta T$  = stack gas temperature – air temperature, K

$T_s$  = stack gas temperature, K

The above equation is suitable for neutral atmospheric conditions. For unstable conditions,  $\Delta h$  should be increased by a factor of 1.1 to 1.2 and for stable conditions; it should be decreased by a factor of 0.8 to 0.9.

### 3.7 Socio-economic Issues

The social assessment is based on issue-oriented approach. One of the critical components of this social assessment was to know what the potentially affected public believes the issues to be. The process addressed the public concerns about the various likely social impacts. These issues are important at the outset of the assessment as they are critical in the implementation of the project. The local community issues have been taken seriously and addressed explicitly throughout this assessment for practical implementation and operational phase of the development.

Public consultations were carried out with the local communities in form of general meeting and on individual basis people within the vicinity of the project area. Consultative meeting held on the 17 December 2008 at Kkolo/Buwanyi zone (LC1), Nantabulirwa Parish-Seeta Mukono District. The agenda of the meeting was as follows:

- Introduction
- Communication from the Secretary LC1
- Remarks on EIA methodology by EIA team
- Open discussion with stakeholders
- Resolution
- Closing remarks from secretary

The Secretary of the LC 1 committee (Nampijja Harriet) introduced herself and officially opened the meeting at 12:45 pm. The secretary begun by informing the residents present the reason for calling the meeting was to seek their views on the proposed roofing industry to be set up in their place. She then requested the EIA team to clarify on the major purpose of the meeting

The residents were informed that it was a basic requirement for all developers to do an EIA as stipulated in the Third Schedule of the National Environmental Act (NEA) before construction. All views of community members are taken care and incorporated into the environmental impact statement so as to guide NEMA in making a decision. It was clarified that the developers are by law required to carry out impact assessment for proposed developments (Roofings Ltd) that are likely to have significant environmental impacts so that any negative impacts can be minimized or eliminated and positive enhanced

The community members were informed of the contents of an environmental impact statement:

- Introduction which includes project location, objectives, description of project and its activities
- Review of relevant legislation to establish the legal framework within which to carry out the assessment
- Determining baseline information at the site for example social economic, biophysical and the general environment.
- Identification of potential environmental impacts and recommendation of appropriate mitigation measures
- Evaluation of significant impacts
- Analysis of the alternatives. This includes location and technological alternatives to be used during and after implementation.
- Preparation of a monitoring and management plan; which includes environmental audits and continuous supervision by lead agencies. it also enables the developer to manage the potential negative impacts
- References show authentic sources of research and citations used in preparation of the EIS

If there are any issues the developer needs to address in the EIA report, NEMA requires that they are rectified before issuing a certificate.

### **3.8 Issues raised by stakeholders**

- There are graves (6) within the site. Apart from that there are no known archaeological, cultural or historical sites in the project site that will be potentially threatened by the proposed development;
- Some members of the community expressed worry over their protected spring located within the land allocated to Roofings Limited that has been polluted since clearing of the site and levelling of the site began;
- There are no land wrangles between the developer and the stake holders;
- Although they acknowledged that security of the area will improve, there was worry on to whether their right of movement at any given time will not be infringed upon;
- There was fear of noise pollution and water pollution from chemicals emitted by the factory;
- Majority of the residents anticipate employment opportunities during construction and when the factory is operational;

- The community was happy and appreciated the fact that they were being consulted as residents near the industrial site;
- This is a development in the area and its welcome and;
- Community was worried that their children may disappear during construction of the roofing materials industry.

The residents agreed that the development can be implemented and their issues of concern addressed. The main issue of concern is to ensure that their spring is protected or an alternative spring set up so as to ensure they get clean and affordable water. These have been discussed in this report and mitigation measures recommended.

The secretary local council thanked all the residents for turning up and said she had no problem with the site as long as the resident's fears are addressed. She recommended the development to be implemented. The meeting was adjourned at 3.10 p.m.

**Table 3.2: Concerns/views of People consulted**

| Name/address                            | Designation   | Comment                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-----------------------------------------|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Mr. Musitwa<br>Sentoggo<br>0782- 468605 | LC 1 Chairman | <ul style="list-style-type: none"> <li>• The industry is to be located on a site having two wells (Landi and Makumbi wells) which people depend on for their water needs.</li> <li>• Due to the grading process taking place, the natural protected spring/ well has been polluted by the eroded soil from the site.</li> <li>• Since the most important well/spring is located on Roofings Limited land, it will be enclosed after development implying that the residents will no longer have a chance to use the well. Therefore, there is need to construct for the residents an alternative source of water.</li> <li>• For those who have crops, it was agreed earlier that there is no need of compensation since the residents were given enough time and prior notice long before the project commences.</li> <li>• The graves on the site should be removed before any grading takes place and the owners of the graves should be given time and chance to relocate the remains of their people who were buried on the land when it was still under National Forest Authority.</li> <li>• The industry is a good development and there is no objection as long as the key aspect of water is solved.</li> </ul> |
| Nampijja Harriet                        | Secretary LC1 | <ul style="list-style-type: none"> <li>• We do not have any objection as long as the issue of water is solved.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

|                            |          |                                                                                                                                                                                                                                                                                                                                                                     |
|----------------------------|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 0772-954313                |          | <ul style="list-style-type: none"> <li>• Community consultation is also very important</li> <li>• People are scared of their children who may be sacrificed for the industry. People need to be assured of their safety.</li> <li>• The spring has been providing clean and reliable water that has never dried up.</li> </ul>                                      |
| Zalamba Vincent            | Resident | <ul style="list-style-type: none"> <li>• We are positive about the development since it is going to bring development to our place.</li> <li>• If heavy machines are used it may lead to noise pollution and vibration</li> <li>• If taps are provided, there may be a problem of water cuts which we are not used to since we have constant water flow.</li> </ul> |
| Agume Bosco<br>0714-236634 | Resident | <ul style="list-style-type: none"> <li>• Expect jobs since we were chased from the forest where we used to grow crops and hunt animals for survival.</li> </ul>                                                                                                                                                                                                     |
| Waswa David                | Resident | <ul style="list-style-type: none"> <li>• I don't have any problem with the site but I don't know which chemical are to be used in manufacturing the sheets and how they may affect the well if it's left intact.</li> <li>• Does the word Namanve industrial part indicate that the people are not supposed to be in that area?</li> </ul>                          |
| Kalulu Simon               | Resident | <ul style="list-style-type: none"> <li>• Won't the factory security take away our free movement at any given time of the night?</li> </ul>                                                                                                                                                                                                                          |
| Turyagenda<br>Godfrey      | Resident | <ul style="list-style-type: none"> <li>• Industry may cause air pollution which may affect our health and environment.</li> </ul>                                                                                                                                                                                                                                   |

### 3.9 Existing Environment, Health and Safety Programme

There are two types of environment that can be affected by activities of Roofings Ltd; namely: the general environment external to the factory premises; and the working environment internal to the factory. One of the main general environmental problems of the current Lubowa factory is the management of scrap (solid waste management). The scrap from Lubowa factory, together with outsourced scrap, will be used in the Phase 2 of Namanve plant in the Hot Rolling Mill Complex.

The working environment at Lubowa is characterised by handling of pre-coated iron sheets, semi-finished bars and hollow sections which are shaped and cut to desired profiles. There is therefore limited value addition. However the hazards such as noise, handling of sharp sheets, carrying of heavy objects occur.

The Roofings, Namanve will be adding more value in form of Wire galvanising, Hot Rolling of Steel, and Cold Rolling (polymer coating) of iron sheets. While these processes will be more

complex, it is reported that the new plants have been designed to improve the safety standards considerably. In addition the occupational health and safety systems already established at Lubowa will be maintained, or even improved at the Namanve factory.

### **3.9.1 Noise**

Current operations at Lubowa factory are very noisy. Workers are provided earplugs and ear muffs. The new processes at Namanve will be enclosed and automated. Even then, persons going into the work areas for monitoring or maintenance work will be required to have appropriate ear protection.

### **3.9.2 Energy**

At Namanve, apart from mains electricity, there will be use of Liquefied Petroleum Gas (LPG), especially in Phase 1 (Wire galvanising) where 37 tonnes will be used per month, and in Phase 3 (Cold Rolling Mill) where 284 tonnes will be needed per month. Of course the LPG, especially in such big quantities is a fire risk, but also if leakages occur it can be an asphyxiant. Therefore Roofings and the supplier of LPG, Shell, will have to take the necessary safety precautions on a continuous basis.

### **3.9.3 Risk of major accidents**

There will be three big plants at Namanve all requiring transportation of large quantities of inputs and large quantities of outputs. Therefore smooth management of traffic will be necessary to avert major accidents.

Large quantities of LPG will be used. This is a definite fire hazard which could cause major accidents. The necessary preventive precautions must be put in place.

There will be large quantities of hydrochloric acid for pickling the steel in the wire galvanising process and in the cold rolling mill process. There will also be large quantities of alkali for neutralising the acid. Both acid and alkali are corrosive, and so they can both be cause of major accidents. Therefore again, necessary safety measures must be in place to prevent the accidents.

It is planned that the handling of the acid will be done in the direction of the wind, towards the lake, so that the neighbouring factories and communities, as well as the factory employees are not adversely affected by acid fumes.

The Phase 2 Hot Rolling Mill process will involve outsourcing large quantities of scrap metal from Uganda and the Great Lakes Region. Because of the many wars in the Region, it is conceivable that unexploded ordinance, such as grenades, could found in the scrap. Therefore special effort will have to be made to exclude such unexploded ordinance before the scrap is loaded into the furnace, in order to avoid major explosions in the furnace.

### **3.9.4 Environmental and Occupational Health and Safety**

Roofings Ltd is reported to have a Health Safety and Environment Policy (a copy of which is in Annex 5). However, Roofings Ltd does not yet have a Health, Safety and Environment Committee. The HSE function is overseen by the System Committee, which reports to the General Manager.

## 4 PROCESS DESCRIPTION OF PROPOSED PROJECT

Roofings Limited has been allocated 30 acres of land at Kampala Industrial and Business Park, Namanve where it intends to establish a new division for manufacturing more products. The proposed project will be implemented in three phases:

- Phase One – Wire Galvanising Complex
- Phase Two – Hot Rolling Mill Complex
- Phase Three – Cold Rolling Mill Complex

### 4.1 Phase One: Wire Galvanising Complex

The phase one of the proposed project will adopt the latest technology for manufacturing galvanised wire of diameter 1.50 mm to 4.00 mm from hot rolled low carbon steel. The plant is expected to be commissioned in July 2009. Equipment for this phase will include wire drawing lines from Koch (Germany), pay offs and take ups from M+E (Italy) and galvanising plant from QED (Canada). The flow process for the wire galvanising complex is shown in Plate 4.1. The wire galvanising complex will produce 10 800 tons per annum of galvanised wires with an estimated investment of USD 13 million.

### 4.2 Phase Two: Hot Rolling Mill Complex

This will involve manufacture of rolled steel bars and the complex will include steel scrap, induction furnace, billet caster, reheating furnace and hot rolling mill. The flow process for the hot rolling complex is represented in Plate 4.2. The hot rolling mill complex will produce 36 000 tons per annum at an estimated investment of USD 24 million.

### 4.3 Phase Three: Cold Rolling Mill Complex

The cold rolling mill complex will produce 150 000 tons per annum of cold rolled steel sheets at an estimated USD 120 million. It will consist of the pickling line, 6 high reversing mill, galvanising plant and paint coating line. The flow diagram of the cold rolling mill complex is presented in Plate 4.3.

Pickling process involves removal of oxide scales from the surface of hot rolled steel (raw material) by treatment with dilute acid. The acid will be recycled through an acid re-generation plant.

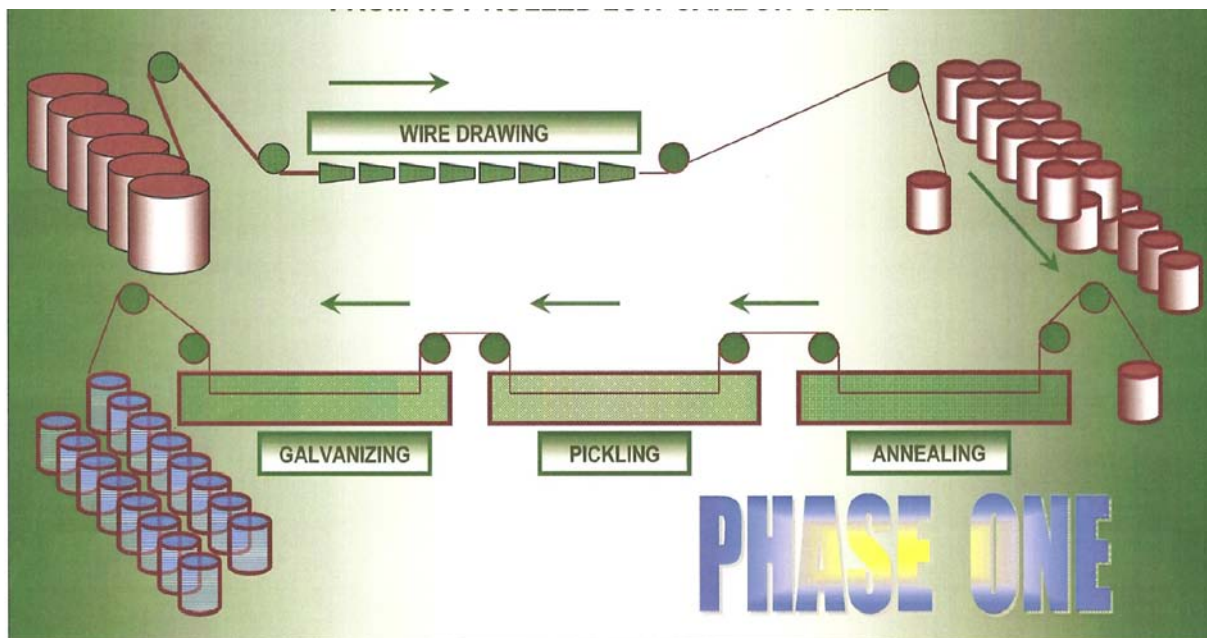


**Plate 4.1: Process flow diagram for Wire Galvanising Complex for Phase One**

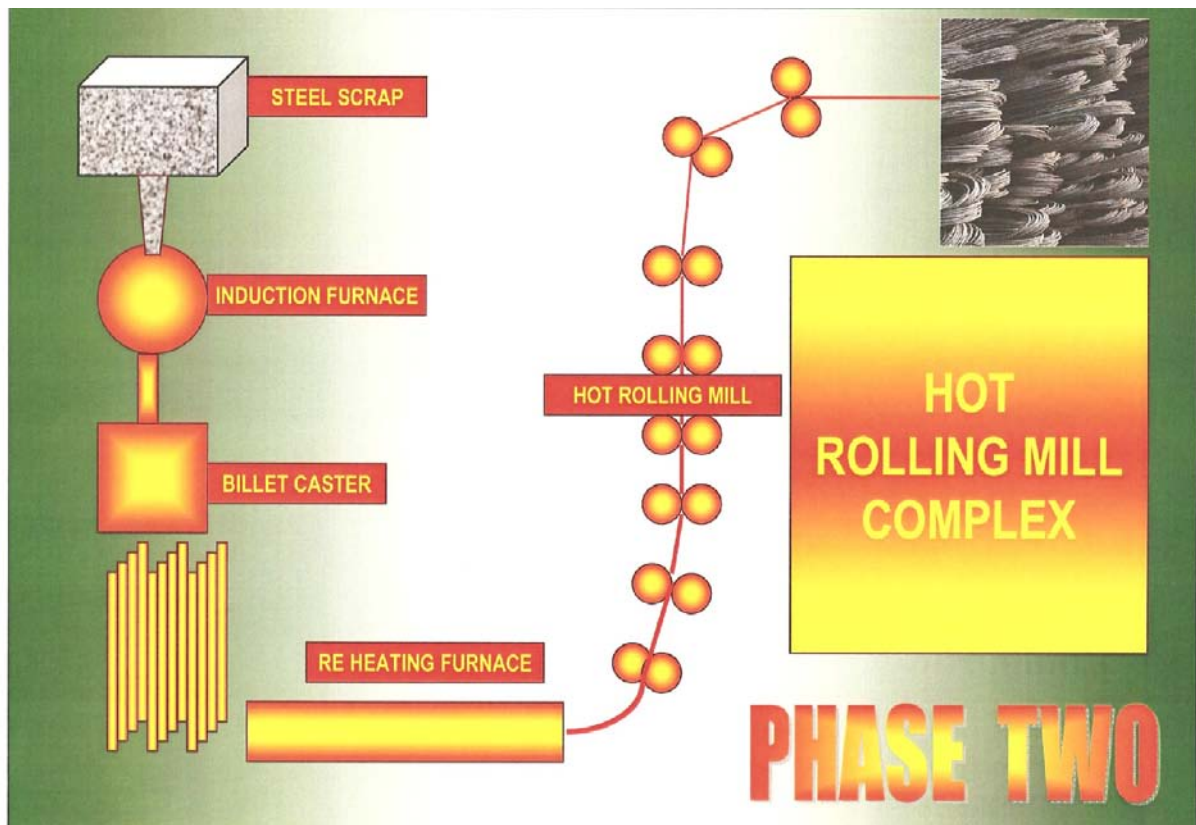


**Plate 4.2: Process flow diagram for Hot Rolling Mill Complex**

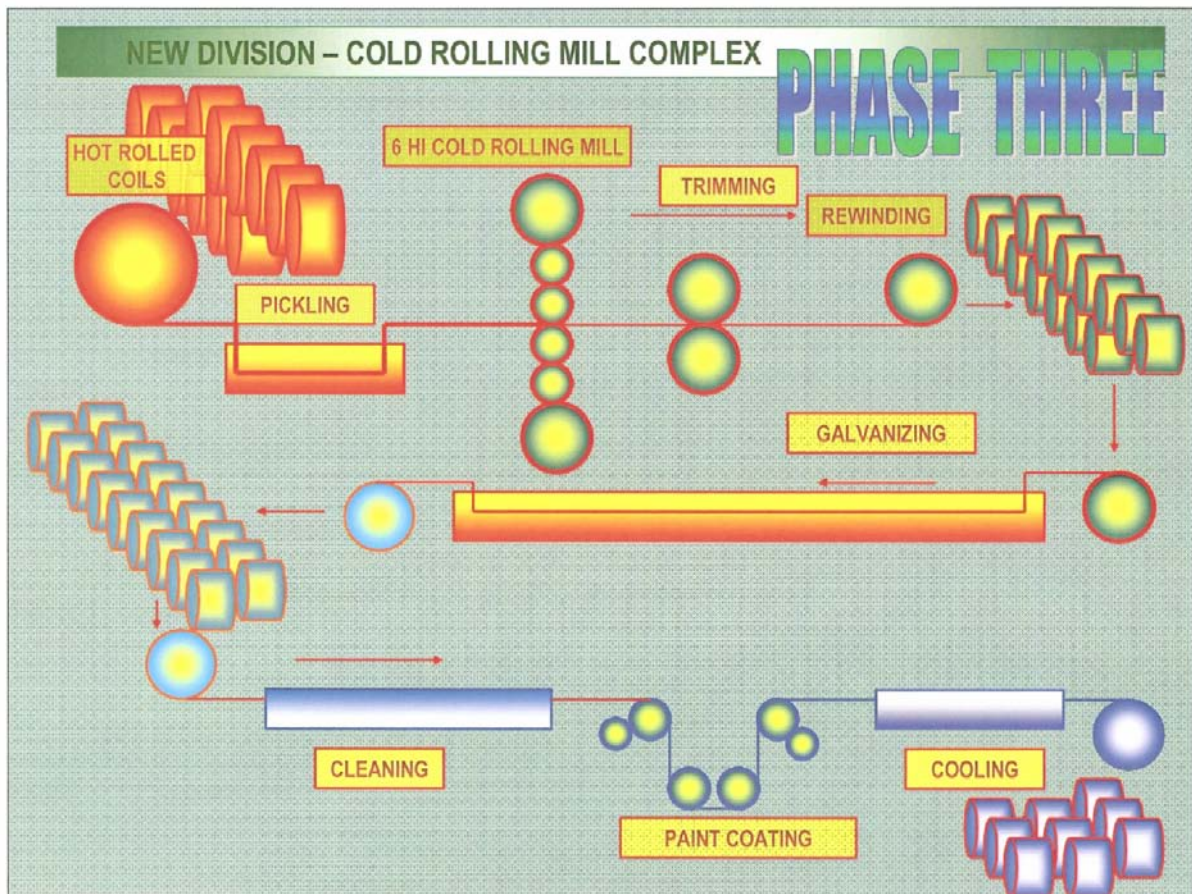


**Plate 4.3: Flow Diagram for the Cold Rolling Mill Complex**

## **5 POTENTIAL ENVIRONMENTAL IMPACTS AND PROPOSED MITIGATION MEASURES**

### **5.1 Environmental Impacts during the Construction Phase**

#### **5.1.1 Air Quality**

Dust and exhaust emissions will be emitted from construction activities and construction traffic and can vary substantially from day to day depending on the extent of construction activities and the prevailing weather conditions. With few residential areas located close to the site, dust nuisance will be a cause of concern.

##### *Mitigation measures*

The construction works of the plant should be carried out with good on-site management and working practices. This should include appropriate dust suppression measures such as frequent water spraying and covering any earthen or friable materials during transportation.

#### **5.1.2 Noise**

During the construction phase of the plant, potential sources of noise impact will be mainly from the mobile equipment and or machinery that will be used in earthworks, construction of the infrastructure, building works and installation of recycling facilities and equipment.

##### *Mitigation measures*

Construction activities will be planned and controlled in accordance with the NEMA Noise Standards for construction works. However, construction activities requiring the use of powered heavy mechanical equipment should be restricted at night. The contractors will be required to obtain a Construction Noise Permit (CNP) from NEMA and will need to adhere to the Acceptable Noise Limits (ANL) with the application of necessary mitigation measures such as the use of well functioning silencers and ear muffs (especially for the on-site personnel).

#### **5.1.3 Traffic Generation**

Road traffic will be generated by the construction works during the development of the plant. Ongoing construction of road infrastructure within the industrial park will ease traffic flow within the project area and will minimise pressure on Jinja-Kampala highway..

#### **5.1.4 Water Quality**

Surface run-off from the site can be a source of surface water pollution unless it is adequately controlled. Muddy and/or oily water flowing into the drainage channels will not only have an adverse impact on surface water quality but also create an adverse visual impact. Wastewater will also be generated from temporary worker's camp, if not managed properly, can also cause pollution to the surface water.

##### *Mitigation measures*

Proper drainage system should be provided at the plant to collect surface run-off. The drainage system should incorporate silt traps and oil traps at appropriate locations to remove sand, silt and oil carried by the surface run-off. These traps should be frequently cleaned and

maintained. Wheel-washing facility should be provided to wash the wheels of the trucks leaving the site. Muddy water from the wheel-washing facility should be treated prior to discharge.

### 5.1.5 Waste Management

#### *Solid wastes*

Excavated earth; non-oil contaminated waste materials such as empty wooden/cardboard packages; oil contaminated waste materials e.g. used fuel/oil filters, empty fuel/oil containers; plant debris and construction materials (bricks/concrete blocks, scrap metal pieces, wood, etc) will constitute the main type of solid waste materials that will be generated during the construction phase.

Improper disposal of these waste materials particularly excavated soil or fuel/oil contaminated wastes pose a major hazard to the environment particularly the Namanve River and nearby Kayobe wetlands.

#### Mitigation measures

- Systematic collection and segregation of wastes into hazardous and non-hazardous fractions.
- Clearly labelled waste disposal containers should be put in place at various points around the site to guard against littering and inappropriate disposal of waste.
- Disposal of waste generated at the site should be to an approved waste disposal site.
- Suppliers should be encouraged to take-back packaging and related materials that have the potential of presenting a pollution problem.

#### *Oil spills and leakages*

Spills from routine maintenance, leakages from fuel/oil containers, overfilling or perforations on the vehicle tanks, disposal of lubricants, oils and solvents on the construction site, can cause direct discharge of oil into the soil or the nearby Namanve River and wetlands leading to soil, surface and groundwater contamination.

#### Mitigation measures

- Implement spill prevention procedures and a spill contingency plan.
- Have available on site all equipment and materials required to execute a clean-up operation.
- Preventive maintenance of machinery as part of a proactive system for addressing leaks, among other things.
- Proper storage of chemicals in areas with impermeable floors coupled with secondary containment for spills.

#### *Human sanitary wastes*

The construction of the plant is expected to employ a few professional construction workers and many unskilled labourers. There will be sanitary wastes generated by them, and which if

not properly addressed could lead to a sanitation problem – cholera and disease causing vectors being some of them.

#### Mitigation measures

- Provide adequate sanitation facilities of toilets and portable water, with the number of the former being able to match the employee numbers on site.
- If pit latrine toilets are to be erected, care should be taken to ensure that they do not interfere with the groundwater table.

#### **5.1.6 Visual/Landscape Amenity**

The construction of infrastructure and mainly low-rise buildings for the recycling plant will have negligible or very low visual impact to the surroundings. The visual impact due the construction work for the recycling plant will be minimal hence no mitigation measure is suggested.

### **5.2 Environmental Impacts at Operation Phase**

#### **5.2.1 Water Resources and Usage**

The plant will use large quantities of water and this may put more stress on the already strained water supply in the project area. The current upgrade of the water supply system to Seeta and Mukono will alleviate the problem.

#### *Mitigation measures*

The developer will need to limit unnecessary wastage of water and where possible, the factory should consider having its own water supply system. This could be done by drilling boreholes from which the underground water can be pumped into overhead reservoirs for use by the plant.

#### **5.2.2 Waste Management**

##### *Solid wastes*

During the Operational phase of the plant, scrap metal pieces and zinc drosses and residues from the galvanising baths will be the most significant fraction of solid waste that will be generated. Others such as office related waste and domestic waste are not likely to be highly significant.

#### Mitigation measures

- Waste that is generated should be clearly segregated as some especially as hazardous fractions are likely to be produced.
- Unavoidable scrap metal waste from the production process can be recycled as a byproduct in the sister Company (Roofings Uganda Ltd) in Lubowa.
- Zinc drosses should be recovered and recycled or sold as pure zinc to other manufacturing industries.
- Waste that cannot be recycled should be disposed of at an approved waste disposal

site within Mukono District. Care should be taken to ensure that waste that contains chemicals that could easily leach, is treated prior to any eventual disposal.

#### *Chemical spills and leakages*

Galvanising involves a considerable degree of chemical usage and as such a large volume of them is likely to be stored on site. Some of the chemicals such as acids (Hydrochloric), caustic and zinc are very hazardous, and the nature of the processes in which they are used is likely to lead to their spillage; or their accidental spillage from a given storage facility.

Spillages are likely to occur during;

- The dragging out of metal parts from baths (results in chemical losses); and
- Rinsing of metal parts.

Spillages might not only result in the contamination of soil or destruction of vegetation, but could also lead to water pollution especially of groundwater and that of the adjacent aquatic habitats in the vicinity of the site.

#### Mitigation measures

- Storage areas for the containment of a worst-case spill should be constructed. The storage areas should have bundwalls around them for containing any potential spillage;
- Adherence to the recommended rinsing criteria. In the case of zincing the required criteria is 1.000 – 5.000;
- Ascertaining the minimal amount of water required to achieve the desired rinsing effect from dilution calculations;
- Installing appropriated rinsing technology;

#### *Liquid effluents*

##### (i) Wastewater

Although the plant is expected to use very little water, wastewater production can not be disregarded. Wastewater from galvanising plants usually contains various salts and other residues which when discharged untreated could pose serious risks of soil, surface and groundwater contamination.

##### (ii) Spent pickling acid wastes

In the galvanising plant, these constitute the largest mass of liquid effluent. A major constituent of these wastes is usually Iron Chloride. In case of accidental leak, acid wastes have the potential to contaminate soil, surface water as well as groundwater

#### Mitigation measures

- A reduction in the specific chemicals input as a way of reducing any potential concentration of the effluent;

- Recovery of harmful chemical constituents in the effluent to be used as raw material in other processes;
- Contaminated acids and bases that cannot be used any more could be channelled to other companies for recycling;
- Construction of a wastewater treatment plant;
- Reduction in the amount of rinsing water so as to reduce the burden on the wastewater treatment plant; and
- Neutralisation of some of the chemicals such lime water with caustic soda.

#### *Human sanitary wastes*

At the operation phase, the plant is expected to recruit a wide range of employees ranging from managers, supervisors, machine operators and casual labourers. In addition, the plant is bound to attract a number of customers. Both situations call for a provision for human sanitary wastes disposal. If no provision is made, there is a possibility of indiscriminate and unsanitary disposal of human wastes. This has the potential to attract flies which are diseases vectors or create unpleasant odours in and around the industry premises.

#### Mitigation measures

- Provide adequate toilets/wash centres for safe disposal of sewage and maintenance of good hygiene at the Plant.

### **5.3 Socio-economic Impacts**

The factory is within the Industrial Area that is currently not inhabited but there are a few homesteads at the periphery of the proposed site. This means that there will be interaction with people in the project area. The major socio-economic impact is creation of employment as the work place will employ both skilled and unskilled personnel to run the work place. Employment will be during the different phases of implementing the project (mainly construction and operation). Taxes will also be paid to both central and local governments and this will boost the economy of the project area.

#### **5.3.1 Positive Social Impacts**

The main positive impacts of the project on social lives of local residents will be possibility of employment and development in the area through multiplier effects of the project. The general social positive impacts of the project shall include:

- Project construction would have beneficial impacts on business and industrial growth in the project area as a whole;
- Construction wages would have a beneficial economic impact in the area;
- While growth can be facilitated by other factors such as market demand, political support and social support, the infrastructure to support economic activity must be in place for planned growth to be realized. Therefore, the construction of Roofings Ltd will contribute to secondary, or indirect, impacts on growth in the project area;
- Appreciation of land values and quicker development in general; and
- Employment during construction;

#### **5.3.2 Negative Social Impacts**

There are only a small number of existing homes where proximity effects (such as, noise, air, visual, and traffic) would occur adjacent to the factory during construction and operation. Visual impacts vary depending on the location of homes.

The community access to firewood would have some impacts on distances being increased as the factory would be enclosed. This would have a minimal effect on community character and cohesion. It would not separate residents from public services.

During the construction phase, residents may be disrupted and inconvenienced by dust, noise, heavy equipment traffic on existing roads, changes in the level of service, and safety hazards. Occasionally, there is vibration damage to near-by structures.

The existence of graves and water sources within the project site will require relocation. Roofings is working closely with UIA to effect the relocation without much disruption to social lives of the affected.

On the social economic assessment of the proposed Roofing Uganda Ltd to develop the factory will have more positive impacts than negative impacts of which they can be mitigated.

#### **5.4 Occupational Health and Safety**

Occupational health and safety in the factory is a major concern to most stakeholders consulted. The company must ensure that all workers are provided with personal protective equipment such as gloves, safety shoes, hard hats and overcoats or overalls. The moving parts of the work place will be shielded away from the workers and the principle of good housekeeping will be the guiding system in the company.

The worksite is the best place for taking action to prevent work related injury and disease. It is also an appropriate setting for a broader approach to promotion and prevention. It is therefore necessary to set up an occupational health service. The aim of occupational health as defined by the World Health Organisation is to promote the health and well being of workers in all occupations.

##### **5.4.1 Occupational Safety and Health Measures**

An Environment, Health and Safety (EHS) Policy should be developed and made available to, and understood by, all employees. An EHS manual stipulating the EHS system should be developed taking into account the Ugandan situation but with international standards in perspective. All health, safety and environment measures should be specified in the manual. There should be room for necessary additional measures any time.

-Workers need to choose/elect environment, health & safety representatives to link them with management on issues of environment, health, and safety.

-Each manager and supervisor must consider leadership in, and supervision of, EHS as a primary responsibility.

Education, information and communication (IEC) should form the key pillar of the EHS system.

-Within the EHS system there should be a chemical safety programme, a First Aid Programme,

a Fire Safety Programme, among others.

There will be a health and safety management information system for internal record keeping and regulatory reporting of accidents and diseases to the Ministry of Gender, Labour and Social Development monthly.

-There should be a trained First Aider in each production area, and for each shift. Each trained First Aider should have an accountable First Aid kit. First Aiders will be in addition to, not instead of, the Company Nurse.

Each type of work should be regularly assessed/reviewed for hazards and to determine the necessary preventive measures including ergonomic improvement, appropriate personal protective equipment and relevantly tailored education to workers.

The health care scheme provided to employees should be appropriately and cost-effectively extended to the family members.

All employees should have access to a canteen with proper tables, chairs and hand washing facilities for all employees. Shop floor employees should not eat, drink or smoke at their work stations or working areas.

Smoking should be discouraged on health and safety grounds and a smoking cessation programme should be started.

There should be an adequate number of toilets, with separation for female and male employees.

Working hours, overtime, annual leave, maternity leave insurance cover and other welfare arrangements should be equal to or more favourable than the required national standards.

#### **5.4.2 OHS Awareness and Practices**

A culture of environment, health and safety awareness and concern should be developed/enhanced among all Roofings Ltd staff.

A EHS information, education and communication programme should be instituted and permanently supported. The Managing Director of Roofings Ltd should be the Chairman of EHS Committee which will oversee this programme. The EHS Committee composed of management and workers' representatives should have representatives from each Department and from each section of the business complex.

EHS Advisors with appropriate knowledge and skills should be engaged to assist Roofings Ltd to periodically run EHS educational programmes for employees at least once every three months.

### **5.10 Health Services and Welfare**

#### **5.10.1 Mitigation: Medical Services for the Plant**

Successful prevention, like good treatment, needs resources to encourage people, through personal contact and educational programmes, to take a more positive approach to their health

and safety, including change in life styles. Roofings Ltd should have a Medical Scheme which caters for all the staff members and their immediate family members.

The medical scheme should include, at least;

- a) Medical treatment - first aid and emergency treatment, general treatment and treatment of the dependents.
- b) Laboratory investigations;
- c) Medical examinations - pre-employment, periodic (routine and special), demand;
- d) Health counselling - individual;
- e) Family planning - education counselling, provision of services for both employees and their dependents;
- f) (Nutrition information and education, including advice about feeding of workers' children;
- g) Compilation and periodic review of statistics concerning health conditions in the undertaking - maintenance of records, preparation of medical reports, recording and analysis of absenteeism due to accidents and sick leave; (and making returns to relevant authorities);
- h) Supervision of the working environment (prevention of occupational diseases through control of risks to workers' health), occupational safety (prevention of accidents and supervision of personal protective equipment) and general sanitation;
- i) Referral arrangement for all patients that cannot be treated in the plant clinic such as antenatal care, dental care, x-ray and for hospitalisation into general hospitals. For patients who need specialist attention, there should be established a specialists register with the clinic and these are consulted when need arises by sending them the patients with a medical treatment order form (MTO - the format of this is the standard Ministry of Health form);
- j) Co-operation with other services in the undertaking, in particular those concerned with personnel matters conditions of employment, job training, accident prevention, welfare etc.;
- k) Lastly, but not least, advice to management and workers' representatives on working environment and ergonomics, placing and reassignment of workers, prevention of accidents and occupational diseases, welfare of workers and vocational rehabilitation and training.

#### **5.10.2 Mitigation: Welfare Services**

Meals at work should remain free for every worker. The food handlers should undergo regular medical examination in order to protect Roofings Ltd staff from food borne infections. The canteen units should be so improved that both senior and junior staff and workers should be confident and comfortable to have their meals there.

The quality of food, food hygiene and service should be monitored by the Environment, Health and Safety Committee.

There should be a supply of boiled drinking water for employees and staff all the time.

The employees eating utensils should be washed with boiled water or with water and soap for the same reason as above. After washing, the utensils should be kept individually in the canteens to ensure proper hygiene.

Other welfare issues which need to be addressed, and streamlined, by the proposed EHS Policy, System, Programme and Committee include:

- Terminal benefits
- Recruitment and Dismissal
- Housing allowance
- Terminal benefits
- Workman's Compensation
- Funeral expenses contribution

### **5.11 Traffic Management**

Arrangements to control the traffic entering into the plant and coming out should be maintained to avoid accidents.

### **5.12 Collaboration with Partners and Institutions**

Roofings Ltd should keep in regular contact with customers, suppliers, service providers, EHS consultants and institutions, such as Mukono District Administration, NEMA and Ministry of Gender, Labour and Social Development, about EHS matters.

Roofings Ltd should organise Environment awareness seminars for their suppliers and customers at least once a year.

Supplier of goods and services should be made aware of EHS concerns and the need to appropriately respond to them.

Advice should be regularly sought from EHS consultants, NEMA, Ministry of Gender, Labour and Social Development, and any other relevant institutions. Roofings Ltd will endeavour to be a pace setter/good example of sound EHS policy and practice for other factories, and for steel mills and factories in particular.

## 6 ENVIRONMENTAL MANAGEMENT PLAN

The Environmental Management Plan (EMP) describes the range of environmental issues associated with the proposed factory and outlines corresponding management strategies that will be employed to mitigate potential adverse environmental effects.

The proposed development will observe and comply with all local laws and regulations, which seek to ensure that the construction work does not affect the environment and social-community resources. In the event of a conflict between the requirements set out in this plan and the quality control laws, regulations and ordinances of Uganda, the more restrictive requirements or regulations will apply.

The EMP is a working document, which provides direction and assistance in:

- Construction activity and procedures to protect the environment;
- Environmental mitigation measures

The proper management of the factory will minimise or eliminate the negative impacts that are likely to be caused by the project. Management of the proposed project is committed to implementing the project in an environmentally sustainable manner. The Environmental Management Plan (EMP) will be implemented during all the phases of project (construction, operation and closure). The main components of the EMP are given in Table 6.1.

**Table 6.1: EMP for the Proposed Reverse Galvanising and Colour Coating Project**

| <b>Environmental issue</b>           | <b>Mitigation measures</b>                                                                                                                                                                                                                         | <b>Responsible Party</b>                                                       | <b>Impacted area</b>        | <b>Monitoring Indicators</b>                                                                                                         |
|--------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| Local waterways                      | - Contour storm water drainage<br>- Prevent soil erosion into drainage channels                                                                                                                                                                    | Roofings Ltd<br>DEO (Mukono District)                                          | Drainage channels           | Water quality                                                                                                                        |
| Fuel, grease and oil spillages       | Construction of bunds around equipment<br>Waste oil collected in dedicated drums for proper disposal                                                                                                                                               | Roofings Ltd                                                                   | Water courses               | - Leakages<br>- Oil films on water surfaces                                                                                          |
| Environment, Health and Safety (EHS) | - Implement sound technologies<br>- Provision of personal protective equipment (PPE)<br>- Development of EHS policy<br>- Safety precautions and warnings on equipment in workshops and factory<br>- Training and sensitising workers on EHS issues | - Developer<br>- Workers<br>- DEO<br>- Dept. of Occupational Safety and Health | Workers<br>Company property | - Number of accidents and injuries amongst workers<br>- Levels of absenteeism among workers<br>- Financial loss when accidents occur |

|                                       |                                                                                                                                                                                                                                                                                                                                 |                                                                                             |                                               |                                                                                                                                                                                      |
|---------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|-----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Noise                                 | <ul style="list-style-type: none"> <li>- Restrict noisy activities to day time</li> <li>- Provide PPE against noise</li> <li>- Use modern technology with noise control measures</li> </ul>                                                                                                                                     | Roofings Ltd                                                                                | Workers<br>Other Residents in Industrial Area | <ul style="list-style-type: none"> <li>-Complaints from residents and workers</li> <li>- Noise level measurements</li> </ul>                                                         |
| Sustainable implementation of project | <ul style="list-style-type: none"> <li>- Work closely with stakeholders</li> </ul>                                                                                                                                                                                                                                              | <ul style="list-style-type: none"> <li>- Local residents</li> <li>- Roofings Ltd</li> </ul> | All stakeholders                              | <ul style="list-style-type: none"> <li>- Success of project</li> </ul>                                                                                                               |
| Management of wastes                  | <ul style="list-style-type: none"> <li>- In-house controls to reduce wastes</li> <li>- Use of wet cleaning methods in dusty areas and provision of PPE where appropriate</li> <li>- Construction of bunds and containments to control spills into water bodies</li> <li>-Minimise generation of construction wastes.</li> </ul> | Roofings Ltd                                                                                | Project area<br>Workers                       | <ul style="list-style-type: none"> <li>- Water quality in drainage channels</li> <li>- Air quality</li> <li>- Aesthetics of the area</li> </ul>                                      |
| Socio-economic programs               | <ul style="list-style-type: none"> <li>- Monitor progress of community benefits</li> <li>- Sensitisation of communities in project area</li> <li>- Give priority to local residents for some employment opportunities.</li> <li>- Relocate graves and water sources that are currently within the project site</li> </ul>       | Residents<br>Roofings Ltd<br><br>UIA                                                        | Immediate localities                          | <ul style="list-style-type: none"> <li>- Records of monitoring programme</li> <li>- Number of local residents employed</li> <li>- New location of graves and water points</li> </ul> |

## **7 ENVIRONMENTAL MONITORING PLAN**

Environmental monitoring will be part of the overall environmental management plan. The results of the monitoring can form part of the annual audit. In addition to provisions set out in section 23 (1) and (2) of the National Environment Act, the factory shall, as prescribed in subsection (3) of the same section, undertake to monitor and keep records and make annual reports to NEMA describing how far the project conforms in operation with the statements and mitigation measures in this EIS. The following monitoring indicators shall be used by the developer and/or relevant authorities to evaluate the environmental performance of the factory operations:

- Water pollution, for example, through waste discharges or oil pollution;
- Levels of noise during peak hours of operation
- Training programmes including awareness and capacity building
- PPE provided to the workers
- Periodic (bi-annual) medical assessment of factory staff for occupational exposure

### **7.1 Monitoring measures**

Environmental monitoring may be thought of as an environmental contamination thermometer. The data collected through it may be used not only as a guide to technological improvement and performance measure, but also as a source of credibility and trustfulness in the relationship with the surrounding population, since lead recycling plants are usually regarded as a huge source of environmental contamination.

### **7.2 Monitoring targets**

- a. effluents: after being treated at the effluent treatment station, all the water leaving the plant should be monitored in order to determine, at least, its pH and representative heavy metals;
- b. soil and plant: periodical analysis of soils and plants around the factory and in the immediate surroundings should be performed in order to detect any contamination or pollution;
- c. air quality: there must have a continuous monitoring of the air quality inside the enclosed buildings at the factory;
- d. medical surveillance: all workers must be monitored for their health and a record must be kept. The immediate surrounding population should also be offered a free check-up periodically.

### **7.3 Conclusion**

The developer plans to establish the factory with the main objective of increasing capacity of the current plant at Lubowa and introducing new technology that is not currently available in manufacture of steel products in Uganda. However, before the development can be carried out, it has to fulfil all the necessary requirement of the laws and regulations of Uganda. The developer has a good plan of implementing the project and it intends to incorporate a number of environmental measures during implementation of the project. NEMA and other relevant authorities need to ensure that the planned activities are executed according to the laws and regulations of the land and the recommendations in this brief implemented.

## **BIBLIOGRAPHY**

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The Occupational Safety and Health Act (2006)  
The Investment Code (1991)  
The Workers' Compensation Act (2000)  
The Employment Act (2006)  
The Land Act, Cap. 227, Uganda

## **ANNEXES**

## **ANNEX 1**

### **TERMS OF REFERENCE FOR EIA FOR PROPOSED WIRE GALVANIZING PLANT, STEEL MELTING AND HOT ROLLING PLANT, PICKLING REVERING GAILVANIZING AND COLOUR COATING PLANT IN KAMPALA INDUSTRIAL AND BUSINESS PARK, NAMANVE**



## NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY (NEMA)

NEMA/4.5

09 December 2008

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**RE: TERMS OF REFERENCE FOR AN ENVIRONMENTAL IMPACT ASSESSMENT FOR THE PROPOSED REVERSING, GALVANIZING AND COLOUR COATING PLANT IN KAMPALA INDUSTRIAL AND BUSINESS PARK, NAMANVE , MUKONO DISTRICT**

Reference is made to your letter of 17<sup>th</sup> November 2008 submitting Terms of Reference for an Environmental Impact Assessment for the above proposed project to this Authority for review and approval.

Review of these terms of reference has been completed and this Authority has found them adequate to address any likely environmental impacts from establishment of the proposed factory.

You may therefore proceed with the Environmental Impact Study and we look forward to receiving copies of the Environmental Impact Statements for our review and consideration.

Waiswa-Ayazika  
**FOR: EXECUTIVE DIRECTOR**

c.c. The Executive Director,  
Uganda Investment Authority,  
**KAMPALA**

## **1.0 Background**

Roofings Uganda Limited proposes to set up a wire galvanizing plant, steel melting and hot rolling plant, pickling revering galvanizing and colour coating plant in Uganda in Kampala Industrial and Business Park in Namanve. The project is categorised under manufacturing sector and will produce and sell galvanized coils (GC) and pre-painted galvanized (PPG) sheets to local and export market. The project idea stems from existence of unfulfilled demand for galvanized and colour coating products in Uganda and surrounding countries. The project will use modern and latest technology and processes when completed. The estimated plant capacity is about 100,000 metric tons (MT) per annum.

Uganda Investment Authority (UIA), the owners of the land as well as the proprietors of the Kampala Industrial and Business Park, have already allocated the site for the proposed project to Roofings.

In line with the Environmental Impact Assessment (EIA) Guidelines (1997) and EIA Regulations (1998) for Uganda, it is the responsibility of any developer intending to set up a project for which an EIA is required to carry out the EIA and bear all the costs associated with its conduct.

Because the proposed development falls under the categories that are listed under Schedule 3 of the National Environment Act as requiring mandatory Environmental Impact Assessment before implementation, an Environmental Impact Study is thus required before the proposed plant can be approved by NEMA for implementation.

According to the Uganda EIA Guidelines (1997), the Environmental Impact Study process starts with the scoping exercise that identifies areas and issues that should be included and addressed in the EIA study process. It is also contained in the EIA Guidelines (1997) and EIA Regulations (1998) that the issues identified through the scoping process should be developed into Terms of Reference (ToR). The ToR are submitted to NEMA and to other stakeholders (Lead agencies) for review so that any other areas and issues deserving to be included are identified before the study commences. These Terms of Reference have been developed from the findings of the scoping exercise.

## **2.0 Scoping Methodology**

The scoping exercise was carried out using a number of different approaches and methodologies as was dictated by the different aspects and dimensions of the project. The methodologies employed included the following:

- Meetings and discussions with major stakeholders, including members of the local community, and lead agencies with a stake on various aspects of the project,
- Field surveys of the proposed project site, including baseline inventory of environmental conditions and resources in the project area,
- Expert judgement and technical evaluation of technical issues related to the nature of the proposed development, and

- Review and reference to literature, including existing laws, regulations, policies and plans to verify how the proposed development conforms to them.

### **3.0 Development of Terms of Reference**

In order to cover all the key dimensions of the environmental issues and concerns anticipated to result from the proposed project, the terms of reference shall focus on key areas that were identified in the scoping process to be representative of the major dimensions of environmental relevance to this particular project. The major dimensions and areas to be covered during the EIA shall include environmental issues identified on the basis of the major thematic environmental areas covering:

- Socio-economic aspects,
- Ecological aspects,
- Land-use, land-use planning and infrastructure aspects, as well as harmony with current and future development plans in the greater Namanve complex.

Impacts (both positive and negative) related to the major phases of the project, including:

- Impacts related to the construction phase, including off-site impacts,
- Impacts related to the operational phase, including induced off-site impacts,
- Impacts related to the post operational phase (e.g. site restoration needs in the event of closure).
- Impacts related to the "no project" option if the project were not implemented at the site at all.

The legal and policy dimension shall consider the conformity of the proposed development and its location to existing policies, laws and regulations in order to ensure that the proposed development will be implemented within the legal and policy framework of Uganda.

The anticipated needs and requirements for environmentally sound operation of the project and the associated environmental impacts, problems, challenges and opportunities for meeting these needs, including infrastructure needs for:

- Piped water supply and sewerage system,
- Sanitation and sewerage disposal,
- Power/electricity supply,
- Adequacy of available land and space for the scale of the planned project and all its associated components,
- Road access and requirements for new access roads, if any,

## **4.0 ENVIRONMENTAL ISSUES IDENTIFIED FOR INCLUSION IN THE EIA**

### **4.1 General Issues**

In order to solicit the views of the local communities and other stakeholders, a series of consultative meetings will be held with major stakeholders such as NEMA, UIA, URC, local leaders, local communities as well as current users of the land where the proposed development will be located. Other major issues of general concern shall include:

- Increase in traffic flow, accidents, dust and noise.
- Widening of the access road
- Visual intrusion
- Pollution risk
- Storm Water and Drainage

#### 4.2 Social Issues

The key social and socio-economic issues identified for inclusion in the study included the following:

- Potential for social disharmony between the local residents and immigrant project employees who may come with some new behaviours and cultures not in harmony with the norms of the local residents.
- The presence of some crops and cultivated pieces of land within the proposed project site will inevitably require that the concerned cultivators be displaced and informed about the proposed development on such terms applicable to their legal rights, if any, against the rights of the intending developer. It was, however, established at the time of scoping that the current cultivators on the land are illegal encroachers with no legal ownership of the pieces of land they cultivate.
- There exists a series of access roads and motorable trucks within the proposed project site. Available information suggests that some of these are used to access resources such as sand and bricks. Development of the proposed project site will therefore deny the concerned parties not only access via this area, but also access to the resources currently being exploited in the area. The implications of this have to be established through the study.
- Risk of intensification of winds that may cause property damage in the neighbourhoods once the existing trees (wind breakers) are felled as a result of the proposed development. This concern was expressed by the local residents who indicated that massive tree felling in the area has in the past led to winds causing property damage in their locality due to unchecked strong winds.
- Microclimate change due to massive vegetation clearing was also of concern to the local residents, who observed that the current vegetation cover in the project area helped to moderate temperatures in their locality.
- Concern about false promises for jobs. Whereas members of the local community would prefer that development activities in their neighbourhoods give preference to local residents for jobs, they are equally weary of the fact that most developers have in the past made false promises for jobs that were not fulfilled. Local residents are thus concerned that issues of jobs on the proposed project must be taken into consideration without raising false hopes among members of the local community.
- Anxiety about the social amenities to be provided by the project to benefit the local community was also expressed by the local residents, as an issue to be addressed by the developer.
- Risk of air pollution and exposure to noxious gaseous emissions, such as exhaust fumes and dust was expressed by the local residents and will require to be addressed during the study.

#### **4.3 Identification of ecological issues**

Field surveys of the proposed project site will be conducted with a view to identifying the following:

- Ecological status of the project site, including ecological resources found in the project site,
- Current ecological values of the resources found at the site,
- Identification of sensitive ecological resources worth conservation, protection and management,
- A review of legal and policy issues pertaining to the ecological resources found at the proposed project site in order to identify legal and policy issues which the study must address.
- Evaluation of the biodiversity resources in the proposed project area, especially presence of any species of conservation value or special conservation status.
- The impact of the expected level of land/vegetation clearing against microclimate values associated with the existing forest ecosystem will need to be evaluated.

#### **4.4 Identification of land-use and infrastructure issues**

The key land-use, land-use planning and infrastructure issues identified for inclusion in the study included the following:

- Whether the proposed project will not lead to any major conflicts in relation to existing and any other future land-uses and developments in the area,
- Whether the proposed project is in harmony with and is part of an integrated Industrialisation Policy and other development plans in the area and its immediate surroundings,
- Evaluation of the adequacy of the existing road and rail network to support increased traffic volume once the proposed plant becomes operational. Alongside this will be an evaluation of the proposal for more access roads (as part of the development of the Industrial Park), if any, to support the proposed development.

#### **4.5 Evaluation of conformity to Existing Policies, Laws and Regulations**

The approach employed here will include a review of existing Government policies, laws and regulations with a bearing on the proposed project and its location, with a view to identifying any issues and areas of potential conflict to be evaluated in greater detail during the Environmental Impact study. This evaluation will be supplemented by field visits to identify issues and resources that could present policy or legal concerns. The laws that will need to be reviewed during the study include:

- The National Environment Act, Cap 153, the National Environment (Waste Management) Regulations 1999, the National Environment (Wetlands, River Banks and Lake Shores Management) Regulations 2000 and the EIA Regulations 1998, the National Environment (Standards for Discharge of Effluent into Water or on Land, 1999 and the National Environment (Noise Standards and Control) Regulations, 2003.

- The Water Act, Cap 152, the Water Resources Regulations 1998, Sewerage Regulations 1999, Water Supply Regulations 1999 and the Water (Waste Discharge) Regulations 1998.
- The Investment Code 1991,
- The Land Act Cap 227 and Land Regulations 2004,
- The Public Health Act, Cap 281
- The National Wetlands Policy 1995,
- The Town and Country Planning Act Cap 246,
- The Traffic and Road Safety Act, Cap 361
- The Occupational Safety and Health Act 2006,
- The Workers' Compensation Act 2000,
- Any other relevant laws.

#### **4.6 Identification of Impacts Based on Anticipated Needs and Requirements**

For a project of the scale and magnitude proposed, there will certainly be needs and requirements for certain infrastructure to be in place if the project is to operate in an environmentally sound manner. Examples of such infrastructure needs include, among others,

- Piped water supply and availability,
- Sanitation and sewerage disposal facilities,
- Power/electricity supply,
- Road access and requirements for new access roads if any,
- Existing railway links and requirements for upgrading,
- Waste disposal needs, and
- Adequacy of available land and space for the scale of the planned project and all its associated components,

Uganda Investment Authority has already started the process of improving the infrastructure in the project area and the likely impacts of these activities on the proposed project will be evaluated.

#### **4.7 Impacts Related to Different Phases of the Project**

##### **4.7.1 Impacts Associated with Site Preparation and Construction Phase**

Key environmental issues of concern for inclusion in the study were identified to include:

- Measures for safety and protection of workers during construction, including protection against dust, excessive noise and accidents,
- Measures of control of erosion and run off from the cleared and/or excavated sites,
- Measures for minimisation of run-off due to vegetation clearing and soil compaction at site of construction,
- Measures for avoidance of in-filling of wetland areas with excavation material, construction wastes/debris, or silt,
- Measures for limiting obstruction due to movement of heavy construction equipment and traffic,

- Measures for protection of any ecological resources recommended for protection,
- Sources of construction materials and related extraction methods, and plans for restoration of any such sites,
- Measures for handling and disposal of construction debris and other construction wastes,
- Impacts that may be generated from workers camps, if any, as well as by behavioural tendencies of the workers, such as indiscriminate solid waste disposal,
- Measures for abatement of flooding in the event of any earth impoundment and hydrological interference during construction.

#### **4.7.2 Impacts Associated with the Operational Phase**

Key environmental issues associated with operation of plant to be addressed during the study were identified to include:

- Potential interference with traffic in the area and associated risk of traffic accidents.
- Generation of excessive noise contrary to national noise standards likely to be in force by the time the project becomes operational.
- Establishing nature of anticipated wastes likely to be generated due to operation of the plant and recommending appropriate handling and disposal procedures.
- Occupational safety and health issues for the workers

#### **4.8 Other indirect impacts likely to result from the proposed Inland Port**

By its very nature, an infrastructure project of the magnitude proposed is likely to result into the emergence of other forms of unplanned secondary developments and support activities due to its multiplier effect. Other forms of developments expected to spring up in the area include those that may target the big market created by the employees of the factory in particular and the Industrial Park in general, including:

- Sale of food and crafts,
- Transportation related developments, such as emergence of car parks and stopover stages and related retail trade activities,
- Emergence of housing structures in the neighbourhoods targeting rental from employees of the factory.

In the event that these activities spring up, they may lead to some other environmental problems whose origin will be linked to the establishment of the factory (and the Industrial Park) and the significance of their environmental implications should be evaluated so that appropriate environmental controls are recommended during the study.

#### **4.9 Other General Environmental Issues to be considered during EIA**

- Need to ensure good aesthetic visual quality in the project area,
- Need to adhere to National Environmental Standards during all phases of the proposed development,
- Modalities and measures for handling of hazardous wastes within the facilities at the plant.
- Evaluation of the "No Project" scenario and its environmental impacts,

## 5.0 Monitoring

As a requirement in the National Environment Act, developers of projects for which EIA has been carried out are required to carry out periodic monitoring to ensure that the mitigation and environment management measures identified and recommended through the EIA are adhered to and implemented. It is further required, under the law, that such developers keep and maintain monitoring records which should be made available during inspections and that monitoring reports should be submitted to the appropriate authorities on an annual basis.

In view of this requirement, it will be necessary to include an identification of the monitoring indicators as a component of the Environmental Impact Study for the proposed project.

As a starting point, it is recommended that monitoring indicators should be identified under the main thematic areas covered under this scoping report, i.e.:

- Social impacts,
- Ecological impacts,
- Impacts related to the construction and operational phases, including off-site impacts,
- Impacts related to the post operational phase, and
- Impacts requiring monitoring to ensure adherence and conformity to existing policies, laws and regulations.

## 6.0 Post-operation and Closure Plan

Under certain circumstances that might pertain in the future, the project may have to wind up and close its operation. The Environmental Impact Study should involve an environmental management plan that will, in addition, prescribe the procedures for closure and post-operation procedures so that the environment is almost restored to the 'No Project' scenario as much as possible.

## 7.0 Proposed Study Team

In order to address the issues identified above, it is proposed that the EIA team, all Certified Environmental Practitioners with NEMA, shall include:

| <b>Name</b>           | <b>Position on Team</b>                   |
|-----------------------|-------------------------------------------|
| Dr. Patrick Mwesigye  | Team Leader                               |
| Dr. Charles Koojo     | Environmental Planner/Socio-economist     |
| Mr. Edgar Mugisha     | Waste Management Specialist               |
| Dr. Frank Kansiime    | Ecologist                                 |
| Dr. Deogratus Sekimpi | Occupational Health and Safety Specialist |

## ANNEX 2

## LIST OF PEOPLE CONSULTED

| <b>Name</b>        | <b>Designation</b>    | <b>Organisation</b>   |
|--------------------|-----------------------|-----------------------|
| Naveen Krishnan    | General Manager       | Roofings Limited      |
| Sheikh Arif        | Factory Manager       | Roofings Limited      |
| Waiswa Ayazika     | EIA Coordinator       | NEMA                  |
| Jessica Okwir      | Environment Officer   | UIA                   |
| Augusto Orodriyo   | Construction Engineer | Roofings Limited      |
| Musitwa Sentoggo   | LC 1 Chairman         | Kkolo-Buwanyi village |
| Nampijja Harriet   | Secretary LC1         | Kkolo-Buwanyi village |
| Zalamba Vincent    | Resident              | Kkolo-Buwanyi village |
| Agume Bosco        | Resident              | Kkolo-Buwanyi village |
| Waswa David        | Resident              | Kkolo-Buwanyi village |
| Kalulu Simon       | Resident              | Kkolo-Buwanyi village |
| Turyagenda Godfrey | Resident              | Kkolo-Buwanyi village |

**ANNEX 3**

**SCHEDULE THREE: Fees payable for Project Briefs and Environmental Impact Assessment under Sub-regulation (1) of Regulation 37 of EIA Regulations (1998)**

1. Where the total value of the project does not exceed Shs. 50,000,000/= the amount payable shall be Shs. 250,000/=;
2. Where the total value of the project is more than Shs. 50,000,000/= but does not exceed Shs. 100,000,000/= the amount payable shall be Shs. 500,000/=
3. Where the total value of the project is more than Shs. 100,000,000/= but does not exceed Shs. 250,000,000/= the amount payable shall be Shs. 750,000/=
4. Where the total value of the project is more than Shs. 250,000,000/= but does not exceed Shs. 500,000,000/= the amount payable shall be Shs. 1,000,000/=
5. Where the total value of the project is more than Shs. 500,000,000/= but does not exceed Shs. 1,000,000,000/= the amount payable shall be Shs. 1,250,000/=
6. Where the total value of the project is more than Shs. 1,000,000,000/= but does not exceed Shs. 5,000,000,000/= the amount payable shall be Shs. 2,000,000/= and
7. Where the total value of the project is more than Shs. 5,000,000,000/=, the amount payable shall be 0.1% of the total value of the project.

**ANNEX 4**  
**LAND LEASE**

## **ANNEX 5**

### **ROOFINGS HEALTH SAFETY AND ENVIRONMENT POLICY**