AGRI VALUE CHAIN LTD

ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT FOR CONSTRUCTION AND OPERATION OF EDIBLE OIL REFINERY AND PROCESSING PLANT IN RWAMAGANA INDUSTRIAL PARK

August 2021

INFORMATION SHEET

Name of the project	**CONSTRUCTION AND OPERATION OF EDIBLE OIL REFINERY AND PROCESSING PLANT**
Owner of the project	**AGRI VALUE CHAIN LTD**
Representative	**Mr. Rajneesh Kumar DABRAL**
Email	-
Consultant	**MANIRAFASHA Emmanuel**
License number	**RAPEP/EA/128**
Category	**EA Lead Expert**
Contact	**0788889545**
Email	manirafashae@gmail.com

ACRONYMS:

PFAD: Palm Fatty Acid Distillate

ETP: Effluent Treatment Plant

RDB: Rwanda Development Board

REG: Rwanda Energy Group

WASAC: Water and Sanitation Corporation

RSB: Rwanda Standard Board

HCVs: Heavy Commercial Vehicles

GHGs: Green House Gases

RURA: Rwanda Utilities Regulatory Authority

PPE: Personal Protective Equipment

SUMMARY

Agri Value Chain Limited is a company that will be engaged in refining and processing of edible oil in its proposed plant close to the vicinity of capital city of Kigali (in Rwamagana Industrial Park). The company has plans to set up an oil refinery with 200 MT per day capacity. The end products will be packaged within the facility and then marketed across Rwanda. The company will also be looking into the export markets for its products. This will be an integrated project with oil refining and processing, soap manufacturing, pet bottle and packaging units.

The edible crude oil in Rwanda is currently imported from various sources mainly Indonesia, Malaysia, Argentina and Ukraine via ports city of Dar Es Salaam, Tanzania and Mombasa, Kenya.

Based on the new ministerial order N°001/2019 of 15/04/2019 determining the list of works, activities and projects subject to an environmental impact assessment prior to their commencement, AGRI VALUE CHAIN LTD through their EIA Expert submitted to RDB the project document for screening and elaboration of Terms of Reference for EIA study of the project of edible oil refinery and processing plant in plot No M12&M13 in Rwamagana Industrial Park locating in Bushenyi Cell, Mwulire Sector in Rwamagana District of Eastern Province.

The main objective of this study is to carry out a comprehensive Environmental assessment for the proposed project to be implemented in industrial zone. The Environmental Impact Assessment/ Environmental Management Plan are applied primarily to prevent or minimize the adverse effects of major development projects. It is also used as a planning tool to promote sustainable development by integrating environmental considerations into a wide range of proposed actions.

However, the main objective of this project is to promote Agriculture Processing Sector in Rwanda through installation of edible oil refinery and processing plant.

The continuous refining process entails the following steps: Pretreatment/Degumming, Neutralizing, Bleaching and Deodorization.

The proposed project is expected to have both positive and negative impacts on both the environment and the public, during its construction and operation phases. The all expected negative impacts have mitigation measures.

The project is considered important and beneficial to both the proponent and the general public. It is recommended to the project developer to put in action all indicated mitigation measures and to follow the environmental management plan scheduled in this report.

Contents

1. INTRODUCTION

1.1 Overview

Industry is the core element of economic development and is crucial for the developing countries because of their high unemployment rate. Industry can minimize the unemployment rate by enforcing job opportunities. It further helps economic development by acquiring the foreign currency through exporting their products. Production and processing of different types of oil is one of the major industries in Rwanda, which could be milestone for the economic development, it has proven that it can decrease unemployment rate as well as can contribute to the national growth.

Agri Value Chain Limited is a company that will be engaged in refining and processing of edible oil in its proposed plant close to the vicinity of capital city of Kigali. The company has plans to set up an oil refinery with 200 MT per day capacity. The end products will be packaged within the facility and then marketed across Rwanda. The company will also be looking into the export markets for its products. This will be an integrated project with oil refining and processing, soap manufacturing, pet bottle and packaging units.

The edible crude oil in Rwanda is currently imported from various sources mainly Indonesia, Malaysia, Argentina and Ukraine via ports city of Dar Es Salaam, Tanzania and Mombasa, Kenya.

Before implement the project as stipulated in Rwanda Environmental Law, an Environmental Impact Assessment (EIA) must be prepared as a tool used to identify the environmental, social and economic impacts of a project prior to decision-making. It aims to predict environmental impacts at an early stage in project planning and design, find ways and means to reduce adverse impacts, shape projects to suit the local environment and present the predictions and options to decision-makers. By using EIA both environmental and economic benefits can be achieved, such as reduced cost and time of project implementation and design, avoided treatment/clean-up costs and impacts of laws and regulations.

Based on the new ministerial order N°001/2019 of 15/04/2019 determining the list of works, activities and projects subject to an environmental impact assessment prior to their commencement, AGRI VALUE CHAIN LTD through their EIA Expert submitted to RDB the project document for screening and elaboration of Terms of Reference for EIA study of the project of edible oil refinery and processing plant in plot No M12&M13 in Rwamagana Industrial Park locating in Bushenyi Cell, Mwulire Sector in Rwamagana District of Eastern Province.

1.1. Scope and project Objectives

1.2.1 Scope

Upon reviewing the existing information on this project, scoping was done to identify key impacts to be caused by the implementation of this project. Scoping also directed the study to the area of interest, likely impact areas and entailed a broad assessment of the baseline data of the project.

The EIA team carried out a detailed analysis of the proposed project through: field visits, photography capture, plans and drawing.

1.2.2 Objectives of EIA

The main objective of this study is to carry out a comprehensive Environmental assessment for the proposed project to be implemented in industrial zone. The Environmental Impact Assessment/ Environmental Management Plan are applied primarily to prevent or minimize the adverse effects of major development projects. It is also used as a planning tool to promote sustainable development by integrating environmental considerations into a wide range of proposed actions.

1.2.3 Key Elements focused during preparation of this EIA

- Risk of excess soil being eroded and deposited on the site and its negative effects on the neighbors and downstream road

- Risk of noise pollution of vehicles and its related impacts like air pollution increased in the area due to the implementation of such project.
- Risk of smells to be generated by operation of the plant
- Risk of accidents during the construction and operation phases;
- Effects of generated solid wastes during implementation phase,
- Dust emission during destruction of some houses located in the plot to be exploited
- Risk of fire hazards, accidents, visual intrusion, etc…
- Risk of air and water pollution impact;

2. DESCRIPTION OF THE PROJECT

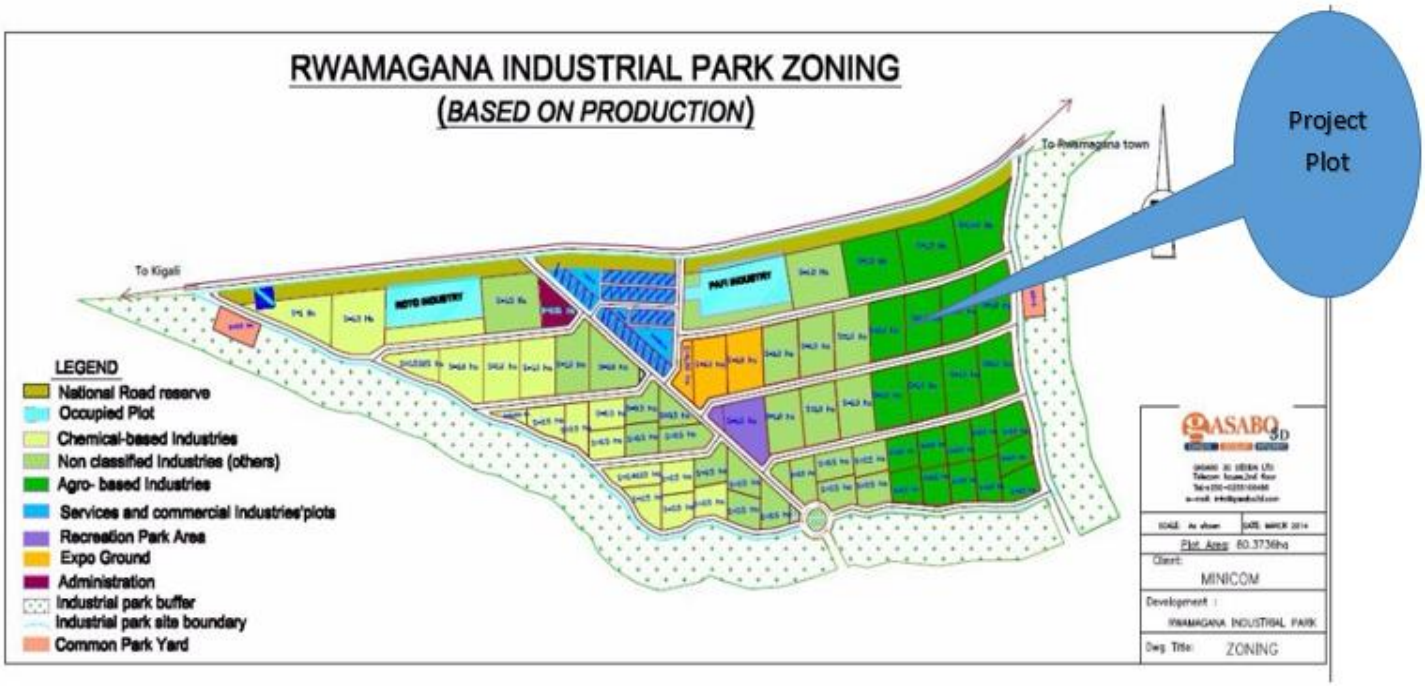
2.1. Geograhic area of the Project

The Rwamagana District is situated in the Eastern Province of the country. The district has in its east the district of Kayonza; in west the districts of Gasabo and Kicukiro; in north the district of Gatsibo and in south districts of Ngoma and Bugesera. The distance between Kigali and Rwamagana is about 60 Km on National Road 3. It is approachable by road in an hour. The population of district is 318,000 people and spread over an area of 681.8 km2. It has a population density of 455 person/km2 (country density is 435 person/km2) and rank 18th among the districts15.

The climate in Rwamagana is warm and overcast. Over the course of the year, the temperature typically varies from *60°F* to *82°F* and is rarely below *57°F* or above *87°F*.

2.2. Project Location Vs Industrial Zoning

Based on production, Rwamagana Industrial Park classified its plots into different part such as roads, chemical based industries, agro based, services & commercial etc. The Edible Oil refinery and processing plant is classified among Ango-Processing category and it will be constructed in reserved area for Agro based Industrial area as illustrated in below map. As the project will be composed by



2.3. Main objective of the project

The main objective of this project is to promote Agriculture Processing Sector in Rwanda through installation of edible oil refinery and processing plant.

2.4. Project size and land requirements

The project will be constructed on the land of 20000 sqm, and will be composed by Factory, Warehouses/ Stores, Weighbridge, Staff Houses, Offices and Ablution Blocks.

The project owner has owned the site that has plot No is M12&M13 as illustrated in the contract of lease of land in Rwamagana Industrial Park between Ministry of Trade and Industry and Agri Value Chain Limited.

2.5. Production/ Manufacturing process

2.5.1. Refining Process

Refining is the process of making something pure or improving it by removing unwanted material Refining of vegetable oils is essential to ensure removal of gums, waxes, Phosphatides and free fatty acids from the oils. The Proponent intends to use Continuous Refining Line, which is recommended for capacities higher than 30 tones per 24 hours (This project will produce 200MT per 24 hours). The continuous refining process entails the following steps

- Pretreatment/Degumming
- Neutralizing
- Bleaching
- Deodorization

2.4.1 Pre-treatment/Degumming

In this stage the oils are given acidic treatment where by gums are precipitated and separated out by centrifugal separation or only gum conditioning is carried out (when gum content is low)and gums are separated in subsequent neutralizing process.

2.4.2 NEUTRALIZATION PROCESS

The crude oil is imported through tankers. The crude oil is sent to the refinery plant for refining. During the crude oil refining process, the Free Fatty Acids are removed and the neutralized crude oil and soap waste produced. The soap stock is separated from oil by using high speed separators. And the color pigments and the metal ions are removed from the neutralized oil.

2.4.3 BLEACHING (DECOLOURING) PROCESS

After neutralization process the crude oil goes through bleaching process which adopts vacuum system to remove the impurities and colour pigments from the crude oil.

The main function of decoloring process is to remove oil pigment, residual soap grain and metal ions. Under negative pressure, the mechanical mixing method combined with steam mixing will improve the decolouring effect. The degummed oil firstly enters into the heater to be heated to the appropriate temperature (110°C), and then goes to the bleaching earth mixing tank.

The oil mixed with the bleaching earth overflows into the continuous decolourizer, which is stirred by non-powered steam. The decoloured oil enters into the two alternate leaf filters to be filtered. Then the filtered oil enters the decoloured oil storage tank through the security filter. The decoloured oil storage tank is designed as the vacuum tank with the nozzle inside, so as to prevent the decoloured oil contacting with the air and influencing its peroxide value and color reversion.

2.4.4 DEODORIZING PROCESS

The bleached oil is steamed at a temperature of 240°C to 260°C to get away the odours and tastes, and then they are cooled into room temperature (about 55°C) for further use. This process has great impact on the quality of the final oil.

The qualified decoloured oil enters into the spiral plate heat exchanger to recover most of the heat, and next goes to high pressure steam heat exchanger to be heated to the process temperature (240-260°C) and then enters the deodorization tower. The upper layer of combined deodorization tower is the packing structure which is mainly used to remove the odour producing components such as free fatty acid (FFA); the bottom layer is the plate tower which is mainly for achieving the hot decolouring effect and reducing the peroxide value of the oil to zero. Oil from the deodorization tower enters into the heat exchanger to recover most of the heat and makes further heat exchange with crude oil, and then is cooled to 80-85°C through the cooler. Add the required antioxidant and flavour agent, and then cool the oil below 50°C and store it. Such volatiles as FFA from the deodorizing system are separated by the packing catcher, and the separated liquid is FFA at low temperature (60-

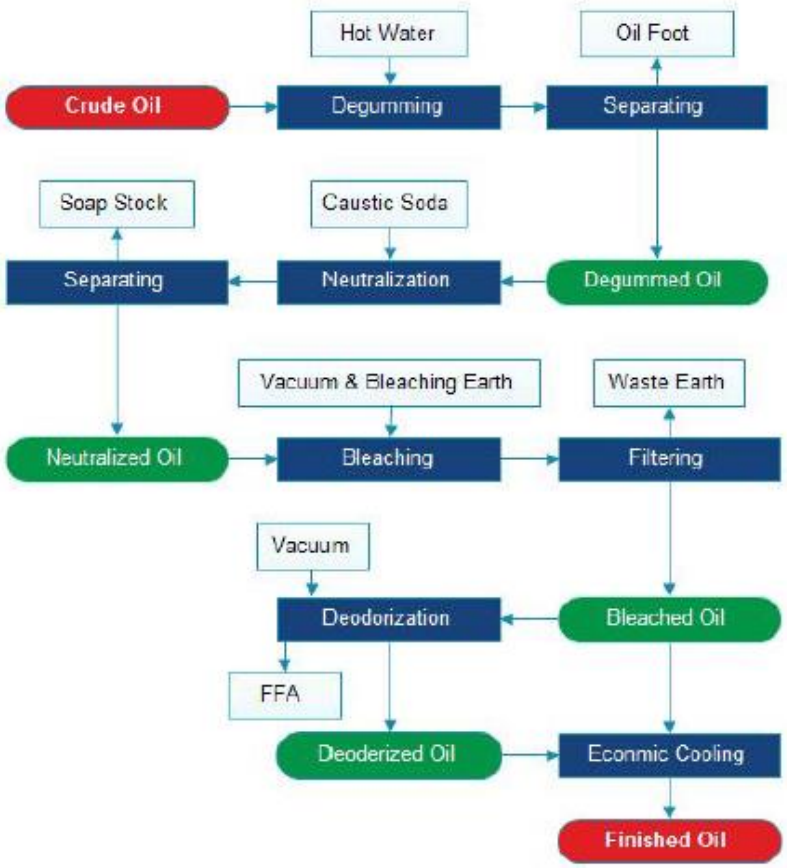
75°C). When the liquid level in the temporary tank is too high, the oil will be sent to the FFA storage tank.

2.4.5 Packaging

This is the final stage of production whereby a coordinated system will be employed in readiness for transportation, warehousing, logistics, sale, and end use.

Deodorizing plant

CRUDE OIL--DEGUMMING--NEUTRALIZATION--DECOLURING--DEODORIZING--COOLING--DEWAXING—FINISHED OIL



Refinery process chart

2.4.2. Soap making process

The production process will require:

- Clutcher
- Vacuum drier
- Plodder
- Soap cutting machine

Note: The set up will be in one of the godowns away from the edible oil production.

Production process:
The PFAD a fatty oil generated as waste during the edible oil refinery is mixed with caustic soda. The process generates water and liquid soap. This is taken to the vacuum drier. The resultant product is taken to the plodder for shaping the soap. After this the soap is taken for cutting into various shapes and automatic wrapping of soap.

2.4.3. Packaging production

Packaging equipment to be produced will be 20 LTR, 10 LTR, 5 LTR, 1 LTR and 500 ML. Packaging containers will be produced through PET pre-forms sealed in a pilfer proof plastic bags enclosed in thick, strong carton boxes are brought in, poured into a pre-form reservoir and fed into the oven by a conveyor. The pre-forms will be heated at 98-105oC and then fed into the container blower fitted with molds, blown into containers using filtered air, cooled and then conveyed to the container filler. The process will be automated.

2.5. Raw Materials Analyses

2.5.1. Raw Materials

The Company will require a number of raw materials, primary being crude oil which includes soybean and palm crude oil. The others include coal, caustic soda flakes, bleaching earth, citric acid, phosphoric acid and commercial additives such as vitamins and minerals.

2.5.2. Source of Raw Materials

The crude oil source countries are mainly Indonesia, Malaysia, Argentina and Ukraine. The company will be importing it through the Mombasa and Dar Es Salaam ports. The crude oil will be transported through oil tankers by road transport from the port cities. The company will engage local transport logistics companies to source the crude oil. Depending on the situation of transport logistics, if the company faces any challenges, the plan is to develop company's own vehicle fleet.
The other raw materials will be sourced both locally as well as through imports.

2.6. Production quantity and market

2.6.1. Annual production capacity

The proposed project capacity is 200 MT/ day of crude oil refining and processing. The Refinery Plant shall have the capacity of processing approximately 60,000 MT of crude oil per year. The annual estimated refined oil production will be approximately 58,000 MT.

2.6.2. Target market

Rwanda is relatively an import based market. The manufacturing sector is growing and government is supporting any investment done in the manufacturing sector to balance the import export gap.

The edible oil market offers a good investment opportunity both in terms of domestic markets and export potential. This is primarily due to Rwanda's unique positioning in terms of its geographic profile. For example, the neighbour Democratic Republic of Congo has a vast market and Kigali, the centre hub of business for Rwanda has close proximity to her borders to the west.

Despite, being an agrarian economy with majority of people depending on subsistence agriculture, the market for oil has a potential to grow. The industrial sector is also growing slowly which will create employment opportunities for the local people and consequently raise the income levels.

2.7. Components Of The Project

2.7.1 Components During Operation

A. Edible Oil Refinery

B. Steam Boiler- Capicity 6T per hour x 2 numbers

C. Thermic Fluid Heater- Capacity 6L KCL

D. Effluent Treatment Plant (ETP)- Capacity 50 KLD

E. Ro System- Capacity 12,000 Ltrs Per Hours (Supplier- Sai Tech, India)

F. Transformer- Capacity 1.6 MVA (Supplier-Universal Transformer, India)

G. Weighbridge- Capacity 100 MT (Supplier- Sensotech, India)

H. Generator- Capacity 100 KVA (Local Sourcing)

I. Raw Water Storage Tank

J. R O Water Storage Tank

K. Reject/ Fire Hydrant Water Storage Tank

L. Crude Oil Storage Tanks

M. Refined Oil Storage Tanks

N. Sterin Storage Tanks

O. Fatty And Storage Tank

P. Diesel Storage Tank

Q. Soap Plant

R. Packaging Plant

S. Acid Oil Plant

2.7.2 Building and Structures Components

A. Administrative And Commercial Block

B. Staff Housing Block

C. Ablution Block And Change Room

D. Store Room

E. Canteen

F. Work Shop

G. Laboratory

H. Security Room

I. Weighbridge Room

J. Electrical Switch Room

2.8. Description of the Project's Construction Activities

2.8.1. Pre-construction Investigations

The implementation of the project's design and construction phase will start with thorough

investigation of the site's biological and physical resources in order to minimize any unforeseen adverse impacts during the project cycle.

2.8.2. Sourcing and Transportation of Building Materials

Building materials will be transported to the project site from their extraction, manufacture, or storage sites using transport trucks (trucks to be covered to minimize dust issue). The building materials to be used in construction of the project will be sourced from neighboring areas.

Greater emphasis will be laid on procurement of building materials from within the local area, which will make both economic and environmental sense as it will reduce negative impacts of transportation of the materials to the project site through reduced distance of travel by the materials transport vehicles.

2.8.3. Clearance of Vegetation

The site has some vegetation cover including grasses and crops growing in it including cassava, maize, sorghum etc. Cleared vegetation will be replaced through landscaping.

2.8.4. Storage of Materials

Building materials will be stored on site. Bulky materials such as rough stones, ballast, sand and steel will be carefully piled on site. To avoid piling large quantities of materials on site, the proponent will order bulky materials such as sand, gravel and stones in bits. Materials such as cement, paints and glasses among others will be stored in temporary storage structures, which will be constructed within the project site for this purpose.

2.8.5. Excavation and Foundation Works

To get a preferable plot for construction, the soil which covers the site shall be excavated and disposed of in approved sites. Note that before excavation start, the Contractor who will be awarded construction services will search for dumping site (if necessary) and will conduct a separate Environmental study for review and approval from respective Authority.

2.8.6 Masonry, Concrete Work and Related Activities

The construction of the buildings, foundations, floors, pavements, drainage systems, perimeter, and parking area of the project will involve a lot of masonry work and related activities. General masonry and related activities will include stone shaping, concrete mixing, plastering, slab construction, construction of foundations, and erection of building walls and curing of fresh concrete surfaces. These activities are known to be labour intensive and will be supplemented by machinery such as concrete mixers.

2.8.7. Structural Steel Works

The whole warehouse will be reinforced with structural steel for stability. Structural steel works will involve steel cutting, welding and erection.

2.8.8. Roofing and Sheet Metal Works

Roofing activities will include sheet metal cutting, raising the roofing materials such as iron sheets and structural steel to the roof and fastening the roofing materials to the roof.

2.8.9. Electrical Work

Electrical work during construction of the premises will include installation of electrical gadgets and appliances including electrical cables, lighting apparatus, sockets etc. In addition, there will be other activities involving the use of electricity such as welding and metal cutting. Note that only licensed (as per RURA) electrical company will be hired to perform the task.

2.8.10 Plumbing

Installation of pipe-work for water supply and distribution will be carried out within the entire plant.

2.8.11 Landscaping

To improve the aesthetic value or visual quality of the site once construction ceases, the proponent will carry out landscaping. This will include establishment of a theme garden and other ornamental tree species where applicable and will involve replenishment of the topsoil.

2.8.2 Building Materials and Energy Used

Several building materials will be required for construction of the plant.

These will include sand, ballast, hard core, timber, cement, clay tiles, metal sheets, electrical gadgets ,and steel, plumbing materials, glass and paints among others. Most of these materials will be obtained locally as well as surrounding areas and all of them must meet RSB standard.

The main sources of energy that will be required for construction of the project will include mains electricity and diesel in case of grid outage. Electricity will be used for welding, metal cutting/grinding and provision of light. Diesel will run material transport vehicles and building equipment/machinery such as bulldozers and concrete mixers. The proponent intends to promote efficient use of building materials and energy through proper planning to reduce economic and environmental costs of construction activities.

2.9. Description of the Project's Operational Activities

2.9.1 Solid Waste

The proponent will provide facilities for handling solid waste generated within the facility. These will include dust bins/skips for temporarily holding waste within the premises before final disposal at the designated dumping site. The solid wastes from each block will be assembled in the garbage collection point ready for disposal by a licensed waste disposal company.

2.9.2 Cleaning

The proponent will be responsible for regular washing and cleaning of the entire plant. Cleaning operations will involve the use of substantial amounts of water, disinfectants, detergents and other chemicals required in edible oil refinery plant.

2.9.3 Waste Water and storm water Management

Effluent Treatment Plant or ETP or Waste Water Treatment Plant (WwTP) is one type of waste water treatment method which is particularly designed to purify industrial waste water for its reuse and to release safe water to environment from the harmful effect caused by the effluent. Industrial effluents contain various materials, depending on the industry. Some effluents contain oils and grease, and some contain toxic materials. Effluents from food and beverage factories contain degradable organic pollutants. Since industrial wastewater contains a diversity of impurities and therefore specific treatment technology called ETP is required. The ETP Plant works at various levels and involves various physical, chemical, biological and membrane processes to treat waste water from different industrial sectors like chemicals, drugs, pharmaceutical, refineries, dairy, ready mix plants & textile etc.

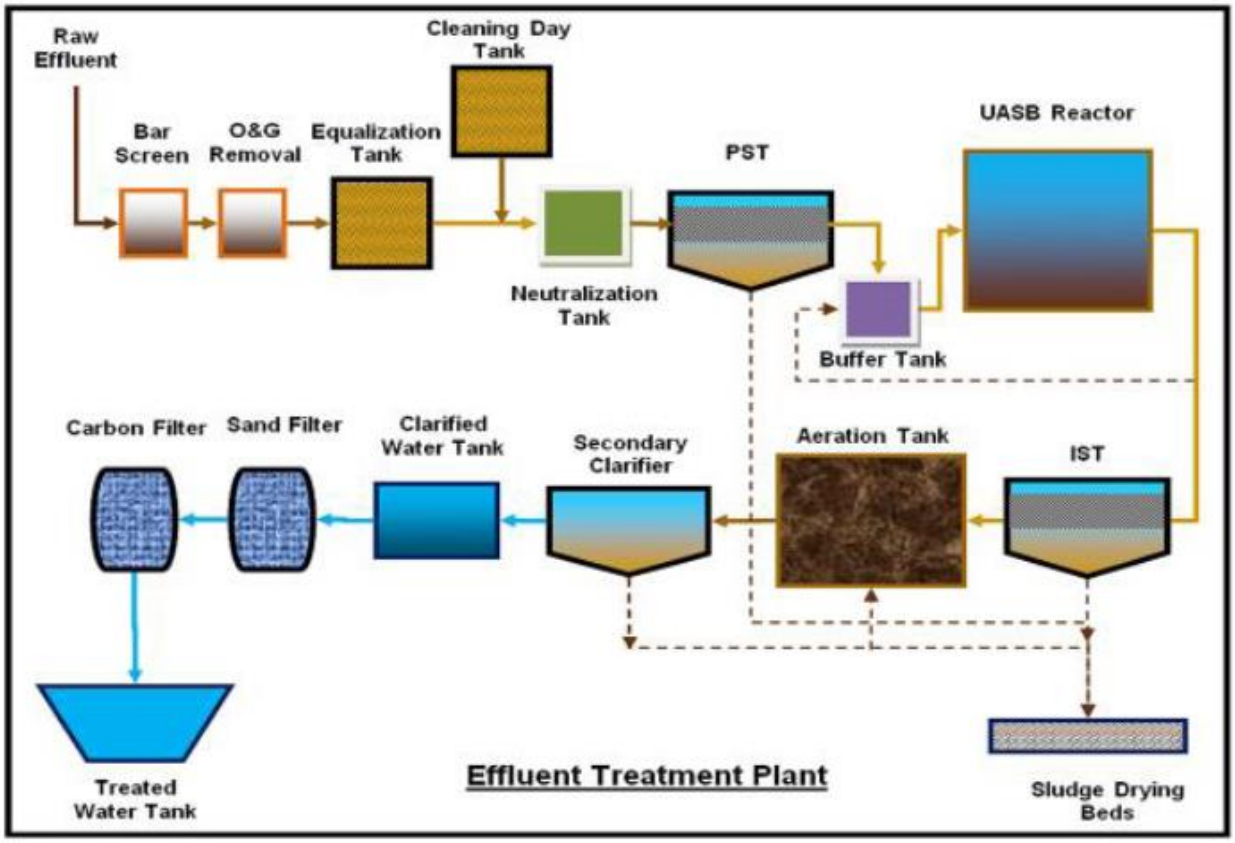
BENEFITS OF ETP

* To clean industry effluent and recycle it for further use

* To reduce the usage of fresh water in industries

* To preserve natural environment against pollution

* To meet the standards for emission of pollutants set by the Government



WwTP Process Flow

3. BASELINE DATA OF THE SITE

3.1. Description of study area

Rwamagana Industrial Park is located on a moderated hilly area and it boarders with various banana plantations owned by deferent individuals making the population neighborhood. Before approving the site as industrial park, the site area was purely under agricultural activities, this area had lately been considered a residential area and most people were expropriated to another place, this activity/ process of expropriation was done by the district authorities.

The project of construction and operation of edible oil refinery and processing plant in Rwanda with a capacity of 200 MT per day will be in plot No M12&M13 in Rwamagana Industrial Park locating in Bushenyi Cell, Mwulire Sector in Rwamagana District of Eastern Province. This plot is located where the infrastructure like water, electricity and road are accessible.

The photos show the road touches the plot

3.2. Description of the existing environment

The plot is located in Rwamagana industrial park, where the local government relocated the local community before the government set the area as industrial park. Nowadays, in this industrial park, some investors installed the industries for exploiting the area. In addition, crops currently cover this plot and some grasses; also, the plot is not far from other industries.


The plot is covered by agricultural activities and is not far from other industries

3.3. Sensitivity and values of environment in the project area

Before setting the Rwamagana industrial park, environmental studies was done to make sure that the industrial park will not affected social and environment. For this project area, there is no sensitive area in term of social and environment. In case the Contractor found any archaeological or cultural property inside the project plot, the following procedures must be followed:

- Solicit services of archaeologist for identification of any findings during construction activities;
- In case any archaeological artefacts or relics are found, the contractors will cease work immediately and inform the District and other entity in charge;
- Train the construction workers to stop working immediately if there are any signs for historical or cultural sites (like bones, tone shards, metal works, etc) visible.

3.4. Present land use of the project and areas contiguous to it

Current land use of the project plot is agricultural activities where crops like cassava, sweet potatoes and maize. The land use of contiguous area of the plot is also agricultural activities, but one side is made by industries while another is the road.

4. LEGISLATIVE AND REGULATORY CONSIDERATIONS

4.1 Institutional Framework

4.1.1 Rwanda Environment Management Authority (REMA)

Rwanda Environment Management Authority (REMA) is directly responsible for environmental administration in Rwanda. Followings are main tasks of the REMA:

- To implement Government environmental policy and advise the Government on legislative and other measures for the management of the environment;
- To conduct comprehensive environmental audits and investigations, to prepare and publish biannual reports on the state of natural resources in Rwanda;
- To undertake research, investigations, surveys and such other relevant studies in the field of environment and disseminate the findings;
- To ensure monitoring and evaluation of development programs in order to control observance of proper safeguards;
- To set up of procedures and safeguards for the prevention of accidents;
- To render advice and technical support to entities engaged in natural resource management and environmental protection; and
- To publish and disseminate manuals, codes or guidelines relating to environmental management and prevention or abatement of environmental degradation.

4.1.2 Ministry of Environment (MoE)

The Ministry of Environment (MoE) is responsible for development of environmental policies and procedures (including impact assessments), protection of natural resources (water, land, flora, and fauna), environmental legislation, biodiversity, and other environmental aspects.

Article 30 for Environmental Law clearly calls for the need to subject projects to mandatory Environmental Impact Assessment. It shall be the same for programs, plans and policies likely to affect the environment. Specific details of projects referred to in this are listed in the Ministerial Order No 001/ 2019 of 15/04/2019 establishing the list of projects that must undergo environmental impact assessment, instructions, requirements and procedures to conduct environmental impact assessment

4.1.3 Rwanda Development Board (RDB)

RDB was created by Organic Law N° 53/2008 of 02/09/2008. It has a mission of improving the well-being of all Rwandans by fast-tracking development, catalyzing sustainable economic growth, and creating prosperity for all. The responsibility for follow-up of EIA studies is now under RDB (in OSC). The department has tasks of screening of proposed projects, provision of Terms of Reference (ToR) for EIA/EMP studies based on Project Brief submitted by the developer, examination/approval of EIA report and so on.

4.1.4 Rwanda Standards Board (RSB)

The mission of RSB is to provide standards for Consumer Protection and Trade promotion and for socio-economic growth in a safe and stable environment. RSB has prepared standards in many sectors such as food, buildings, water supply, effluent quality, etc. It shall be noticed that some standards are still under preparation because RSB is relatively a young institution. Therefore, the construction of buildings and the effluent discharge from new water facilities have to comply with the current RSB standards in order to avoid potential damages and accidents or environmental pollution of ecosystems.

4.1.5 Ministry of Trade and Industries (MINICOM)

The MINICOM is the National institution in charge of industries though the department of Industry and Entrepreurship. Industry and Entrepreurship department works to improve the competitiveness of existing Rwandan industries support the emergence of new industries and coordinate the National Employment Programme for start-ups.

Main Functions of the Department

-Leading the process of policy design, formulation of regulations and strategies on:

- Industrial and SMEs development
- Transfer of technology development

-Setting up guidelines & mechanisms to identify key industrial opportunities and create a conducive environment for its development

-Ensuring the effective implementation of the National Industrial Master Plan to the Industrial zones.

-Supporting the competitiveness of local industries and promote locally produced products to recapture.

-Establishing links and work with stakeholders (National, Regional & International Institutions) to improve industrial development.

-Mobilizing partners and necessary resources for the development of industry and SMEs.

-Coordinating the Monitoring & Evaluation of implementation of strategies and policies related to industrial and entrepreneurship development.

4.2 LEGAL FRAMEWORK

4.2.1 Constitution of the Republic of Rwanda on Environment

The Constitution of the Republic of Rwanda, adopted in June 2003 and revised in December 2015, especially in its article 53 stipulates that everyone has the duty to protect, safeguard and promote the environment. The State ensures the protection of the environment. A law determines modalities for protecting, conserving and promoting the environment.

4.2.2. Law No. 48/2018 of 13/08/2018 Environment

The Law requires that projects, programs and policies that may affect the environment shall be subjected to environmental impact assessment before obtaining authorization for implementation.

4.2.3. The Ministerial Order N° 001/2019 of 15/04/2019 relating to the requirements and procedure for environmental impact assessment

The order aims at determining the requirements and procedures for conducting any environmental impact assessment. This project falls under the category of projects that EIA is required.

4.2.4. The Ministerial Order N° 001/2019 of 15/04/2019 establishing the list of works, activities and projects that have to undertake an Environment Impact Assessment

The order includes a list of projects in various sectors (in paragraph, # 1, it is stipulated that construction of all buildings classified as residential, commercial, administrative or institutional sports facilities, social, cultural, and assembly and religious buildings, hotels, health facilities, educational buildings, or other publicly accessible facilities fulfilling at least two of the following conditions:

a. having capacity to host more than five hundred (500) people;
b. having a total floor area exceeding one thousand and five hundred square meters (1500 sqm);
c. **built in plot size exceeding one thousand square meters (1000 sqm).**

Shall undertake EIA) that have to undertake an environmental impact assessment. This project is falling under mentioned categories it will be built at size exceeding (1000 sqm).

4.2.5. The law on housing

Article 12 of this law stipulates that in the context of protecting environment in human settlements, it is expected to keep a space for planting trees and an adequate system of collection and disposal of storm water (Ministry of Infrastructure, 2015). As regard to the article 34, it states that the transactions of subdivision must begin after compensating the owners or after deposit to the competent authority of the amount of compensation made in accordance with the current legislation on the expropriation.

4.3 International Legislations

4.3.1 Millennium Development Goals (MDGs)

The Millennium Development Goal number 7 on Ensuring Environmental Sustainability is of key relevance to this project. Under this MDG objectives are to:

Integrate the principles of sustainable development into country policies and programs; reverse loss of environmental resources

Reduce by half the proportion of people without sustainable access to safe drinking water

Achieve significant improvement in lives of at least 100 million slum dwellers; by 2020, the project will significantly support the achievement of all three objectives and in particular objective three by providing income to local people in creating jobs.

4.3.2 Kyoto Protocol

The Kyoto Protocol is an international and legally binding agreement to reduce greenhouse gases emissions worldwide which came into force on 16 February 2005. The Protocol encourages improvement in energy efficiency, reform the energy and transportation sectors, promote renewable forms of energy (wind and hydro and geothermal), phase out inappropriate fiscal measures and market imperfections, limit methane emissions from waste management and energy systems, and protect forests and other carbon "sinks".

The measurement of changes in net emissions (calculated as emissions minus removals of CO2) from forests is methodologically complex and still needs to be clarified. Under the Convention, both developed and developing countries agree to take measures to limit emissions and promote adaptation to future climate change impacts; submit information on their national climate change programmes and inventories; promote technology transfer; cooperate on scientific and technical research; and promote public awareness, education, and training. The Protocol also reiterates the need to provide "new and additional" financial resources to meet the "agreed full costs" incurred by developing countries in carrying out these commitments.

4.3.3 Convention on Climate Change

The Convention on Climate Change sets an overall framework for intergovernmental efforts to tackle the challenge posed by climate change. It recognizes that the climate system is a shared resource whose stability can be affected by industrial and other emissions of carbon dioxide and other greenhouse gases.

The ultimate objective of this Convention and any related legal instruments that the Conference of the Parties may adopt is to achieve, in accordance with the relevant provisions

of the Convention, stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system.

Under the Convention governments:

Gather and share information on greenhouse gas emissions, national policies and best practices

Launch national strategies for addressing greenhouse emissions and adapting to expected impacts

Provisions of financial and technological support to developing countries cooperate in preparing for adaptation to the impacts of climate change.

4.4. Description of World Bank Environmental and Social Safeguard Policies and Triggers

This EIA has been designed so that all investments will comply with the relevant laws of Rwanda and the Environmental and Social Safeguard Policies of the World Bank. The 9 World Bank Safeguard Environmental and Social Safeguards Policies are:

- Environmental Assessment (OP/BP[1] 4.01)
- Natural Habitats (OP/BP 4.04)
- Forests (OP/BP 4.36)
- Pest Management (OP 4.09)
- Physical Cultural Resources (OP/BP 4.11)
- Indigenous Peoples (OP/BP 4.10)
- Involuntary Resettlement (OP/BP 4.12)
- Projects on International Waterways (OP/BP 7.50)
- Projects in Disputed Areas (OP/BP 7.60)

[1]BP: Bank Procedure

In preparing this EMP, a consideration of the type of this project and the requirements of the Bank Safeguard policies, has led to the determination that only the following Bank policies are triggered:

1. Environmental Assessment (OP4.01, BP 4.01, GP 4.01)
2. Natural Habitats (OP 4.04, BP 4.04, GP 4.04)
3. Physical Cultural Resources (OP/BP 4.11)

A complete description of the bank safeguards and their triggers for applicability can be found on the World Bank's official web site www.worldbank.org and summary of the policies are as shown below.

Summary of World Bank Safeguards Policies

Safeguard policy	**Description**
OP 4.01 Environmental Assessment	EA to be conducted for all projects that fall into either World Bank Category A or Category B. These categories are equivalent to Government of Rwanda's Schedule 1 and 2 projects.
OP 4.04 natural Habitat	The conservation of natural habitat is essential for long-term sustainable development. The Bank supports, and expects borrowers to apply, a precautionary approach to natural resources management to ensure opportunities for environmentally sustainable development. The Bank does not support projects that involve the significant conservation or degradation of critical natural habitats.
OP 4.09 Pest Management	In Bank- Financing operations, pest populations are normally controlled through IPM approaches, such as biological control, cultural practices, and the development and use of crop varieties

Safeguard policy	Description
	resistant or tolerant to the pest. The Bank may Finance the purchase of pesticides when their use is justified under an IPM approach.
OP/BP/GP 4.12 Involuntary Resettlement	People who have to be removed or who lose their livelihood as a result of the project must be resettled, compensated for all of their losses and they must be provided with a situation that is at least as good as the one from which they came.
OD 4.20 Indigenous Peoples	This policy covers local indigenous people or distinct groups who are marginalized in society and who could be adversely affected by the project. The Bank does not support projects that negatively affect these peoples.
OP 4.11 Cultural Property	Bank supports the preservation of cultural properties which includes sites with archaeological, paleontological, historical, religious or unique natural values. It seeks to avoid impacts on such sites.
OP BP 7.0 International Waterways	If a project has the potential to negatively affect the quality or Quantity of water of a waterway shared with other nations the Bank will insist that a negotiated agreement be established between the two or more nations involved. Irrigation , drainage, water and sewage, industrial and similar projects that involve the use or potential pollution of international waterways (rivers, canals, lakes or similar bodies of water)
OP 7.60 Disputed areas	Projects in disputed areas could affect relations between the country within which the project is being developed and

Safeguard policy	Description
	neighboring countries. Disputes would be dealt with at the earliest opportunity.

5. ENVIRONMENTAL IMPACTS

The proposed project is expected to have both positive and negative impacts on both the environment and the public, during its construction and operation phases. This chapter analyses the possible impacts in all the phases.

5.1. Impacts during construction phase

5.1.1. Positive impacts

Employment

During the project planning and design, the project proponent has already employed consultants including Architects, Engineers and EIA consultants. At reinforcement stage the contractor will deploy workers to help in the construction activities. This will include both skilled and unskilled personnel especially from the local population. The income obtained from the employment will help be better the lives of the persons engaged.

Income to other businesses

Transporters, suppliers of construction materials and other related service providers are expected to benefit from the proposed development.

Income to the local population

If the local community are employed for both skilled and unskilled labors, their neighbors will earn the income from them. The income will boost the economic power of the residents of the area therefore bettering their lives.

Income to the government in terms of taxes

The construction material to be used will be taxable (VAT). Through the revenues generated, the government will be capable of financing its obligations to the citizens.

5.1.2. Negative impacts

Continued sourcing of raw materials

The project will source for raw materials from the environment including sand, ballast, building blocks, cement, wood etc. These materials will have an impact on the environment at their point of origin either through extraction or industrial pollution associated with their production.

Destruction of the physical environment

Destruction to the physical environment during this stage is inevitable. Excavation, for the foundation will create loose soil that may easily be carried away by water or wind. This causes soil erosion and disturbance in soil quality. The excavation activities will also remove vegetation that are available in the plot.

Soil compaction, a characteristic of construction activities, seals the soil on the surface hence hindering the penetration of air or water beneath the surface. This limits the aerobic activities of the organisms underneath the soil, hence affecting soil productivity. Compaction also hinders the infiltration of water into the surface hence increasing the surface run-off increasing the possibility of flooding downstream of the site.

Solid wastes

These activities undertaken during the construction phase are expected to generate considerable quantities of solid wastes such as cuttings, rejected materials, plastic materials, paper, wood etc. These will need to be managed appropriately.

Health and safety of the workers

Workers undertaking construction at the site will be exposed to health and safety risks from the use of machinery, accidental falls and accidental injuries with a potential to cause injury, permanent disability or even death. The health and safety of neighbors and site visitors is also paramount and will also need to be taken into consideration.

Impact on air quality

During the construction phase dust will be expected from excavation of soil and movement of vehicles. If generated in large quantities dust may present a respiratory hazard and also cause visual intrusion. Dust is also a mechanical irritant to the eye.

Air emissions would also be expected from exhausts of vehicles delivering construction material. Stand-by generators that may be brought in to serve during power outages are likely to release some emissions to the atmosphere.

Noise Pollution

Noise from the trucks and other machinery may be a concern during the operations on the site. However, the impact of the noise is expected to be minimal since the project will be set in an area with high background noises.

Wastewater and Effluent generation

Various activities will generate wastewater from cleaning among other activities involved with the use of water whereas effluent will be generated by the site workforce and hence will need proper handling

Traffic issues

The construction works are expected to increase the traffic, along Rwamagana Industrial Park road, by trucks ferrying the construction materials and people nucleating around the site. This is likely to cause traffic snarl-up especially during busy days at the site.

Oil spillage

Activities such as machine re-fueling, oiling or greasing of machines to reduce friction require fuel stock on site. It is emptying and movement of the fuel tanks that cause oil spillage. It is anticipated that oil spillage shall degrade the soil.

Fire outbreaks

Fire outbreaks may be caused by oil spills, electric circuits, and irresponsible use of other electrical materials , which might endanger workers and probably affect the neighbourhood.

5.2. Impacts during operation phase

5.2.1. Positive impacts

Employment

During the project operation, local community and other Rwandan will be employed by the project. This will include both skilled and unskilled personnel. The income obtained from the employment will help be better the lives of the persons engaged.

Income to other businesses

Transporters, suppliers of raw materials and other related service providers are expected to benefit from the proposed development.

Income to the local population

If the local community are employed for both skilled and unskilled labors, their neighbors will earn the income from them. The income will boost the economic power of the residents of the area therefore bettering their lives. Al

Income to the government in terms of taxes

VAT and other taxes will be paid through buying and selling of products of the project as well as working permits. Through the revenues generated, the government will be capable of financing its obligations to the citizens. so, edible oil and other project products to be manufactured locally will reduce imports and boost Rwanda Economy in general.

5.2.2. Negative impacts

Effluent generation and possible water quality degradation

The operational stage of the project will generate wastewater. Being a commercial facility, the wastewater will typically be industrial and domestic. It will constitute a combination of flows from the sanitary facilities, industrial operations and general cleaning. Ground water sources may be polluted if effluent generated at the facility is not managed in an appropriate manner.

Noise generation

Noise is expected to arise from movement of vehicles into and out of the facility especially from workforce and Heavy Commercial Vehicles (HCVs). Noise would further be expected from the industrial nature of the facility owing to the day-to-day operations. The impact of noise from the proposed facility is expected to be low due to the nature of activities to be conducted within the facility and the wider neighborhood.

Air pollution

Air pollution and emissions will occur during the ferrying of goods by HCVs to and from the facility stack emissions. Other particulates may also present hazards to the workers at the facility; these may be from sources such as stored materials.

Without proper precautions, the dust particles are susceptible to wind and may be blown by fast moving wind creating a hazard and nuisance. Generally, the impacts of dust diminish as distance from the source increases and the most acute impacts are likely to occur in enclosed spaces or those in close proximity to the site. Impacts resulting from air quality degradation can include those related to health (although these are typically linked to occupational rather than environmental exposure), visual intrusion and, most commonly, nuisance for surrounding communities.

Increased water demand

The facility will exert an extra demand on water, as it would be required for plant operation, sanitation purposes, general cleaning among other uses. This causes strain on the water resources.

Increased demand for electricity

Operation of the development will require use of electric energy in lighting and powering electrical appliances that will be installed in the facility. Since electric energy in Rwanda is generated mainly through natural resources like water, increased use of electricity has adverse impacts on these natural resources. The facility will be connected to mains supply

from the national grid supplied by REG and backup generators will be used to meet the energy demand.

Solid waste

Waste is expected to result from the operations of the development. The wastes will be in the form of straps, broken pallets plastic wastes, e-wastes, primary polythene packaging and office wastes.

The waste requires to be handled appropriately in order to maintain a clean environment for all. Among the effects associated with solid waste includes; Injuries, generation of odours and public hazards.

The solid waste management plan for the proposed facility will focus on the storing, collection, and disposal of all the solid waste that is produced. This program will implement and develop waste minimization strategies designed to maximize the use of recyclable and reusable materials as well as to report the generated volumes and its reduction schemes.

Fire hazards

Fire hazards are real threats to godown and refinery storage facilities. Threats of fire must be accorded adequate attention and swift action in case of a break out. Fire hazards at the proposed facility may be due to spillage/leakage of flammable liquids such as fuels, electrical faults, operational negligence etc. these may result to losses in terms of injury to persons and damage to property.

Structural safety and insecurity

Cases of insecurity may increase in the area once the development is open for use. Increased commercial and industrial activity will result into an influx of people seeking job opportunities. This influx also invites burglars who are attracted by the goods stored within the godown.

Occupational Safety and Health

Occupational hazards associated with the operations of the facility include but are not limited to injury to workers from movement of machinery, fire, accidental falls and trips, injuries from falling objects and stacked goods, accidents caused by the moving trucks.

Traffic increase

Traffic to and from the facility will increase once it commences operations. This will be attributed to the use of vehicles by staff working at the facility as well as the general public. The impact of traffic is however expected to be minimal since the area is industrial in character and the area already in use by HCVs.

6. MITIGATION MEASURES

Table below summarizes each activity with its likely negative impacts and proposed mitigation measures.

Proposed mitigations, roles and responsibilities for implementation

IMPACTS DURING THE CONSTRUCTION PHASE		
Impacts	**Proposed mitigations/Remarks**	**Responsible**
Destruction of environment during raw materials soursing	• The contractor will obtain raw materials for the construction from sources that are compliant with Rwanda Mining Board (RMB) Regulations. • The contractor will procure quantities that are sufficient for the intended works only and recycle as far as practical to curtail wastage. • The contractor will commit to extensive use of recycled raw materials as will be appropriate and in a manner that does not compromise the safety of the development.	- Construction Contractor (CC); - Construction Supervisor (CS); - Environmental Officer (EO)
Noise pollution	• Make sure all machinery and vehicles are operated efficiently and according to the manufacturers specifications, by trained and qualified operator; • Make sure that activities likely to cause adverse noise impacts are timed to have least impact on surrounding infrastructure; • Make sure all machinery and vehicles are fitted with appropriate mufflers, and that all mufflers and acoustic treatments are in good working order; • Make sure all machinery and vehicles are regularly maintained and broken parts (such as mufflers) are replaced immediately;	- CC - CS - EO

	• Power generator houses should also be located in a manner minimizing the impact of such noise on the health of staff and local personnel working near such facilities. Sound proof should be installed in power generator house; • All construction activities should be done on daily basis for avoid noise impact; • Make sure all personnel are issued with hearing protection and are advised of its proper use; • Developer should respect Rwanda Noise Level Standards (RNLS); • The noise standards for Rwanda are the following according to different areas/zones: ➢ **Industrial area: 75 db (day time) and 70 db (night time)** ➢ Commercial area: 65 db (day time) and 55 db(night time) ➢ Residential area: 55 db (day time) and 45 db (night time) ➢ Silence zone: 50 db (day time) and 40 db (night time)	
Destruction of the physical environment during excavation, for the foundation that will create loose soil that may easily be carried away by water or wind.	• Compacted areas to be ripped to prevent runoff • Restore degraded areas through landscaping using trees and sediment binding grasses	- CC - CS - EO
Solid wastes	• Installation of litter bins and a receptacle that encourage separation of wastes at source to promote re-use and re-cycling, • Recycle and reuse as much as practical within the construction site • Procure the services of a licensed waste handler to manage solid wastes from the construction site • All recyclable materials should be collected by licensed recyclers	- CC - CS - EO

Potential worker accidents from construction activities	• Construction contractor should ensure that all workers have health insurances and accident insurance separately; • Employees to be given the correct tools and equipment for the jobs assigned and trained on their use • Construction contractor should be in contact with the nearest health center/hospital and contact them in case of accident; • First Aid Kits (FAKs) should be available and workers should be trained to use FAKs; • Health and Safety Officer to be recruited and mobilized at site full time during construction phase • All workers and visitors should use Personal Protective Equipment (PPE) which are the following: ➢ Ear muffs: For those working in noisy compounds. ➢ Gloves: Handling of toxic materials of injurious equipment and items. ➢ Helmets: Within site especially where there is loading and offloading of material and at site. ➢ Dust masks: Areas with dust generation such as concrete mixing zones. ➢ Overalls: All construction personnel. ➢ Safety boots: All workers at site. ➢ Eye goggles: Where there are activities such as welding or spraying or eminent risk of eye contamination or injury.	- CC - CS - EO

Job opportunity (Influx of people)	• Awareness campaigns about jobs; • Give priority job opportunity to able and qualified local staff (Especially youth and women); • Develop a code conduct for workers.	- CC - CS - EO
Dust emissions generated from earthworks due to loading and unloading of materials on site and from uncovered truckload/ Exhaust and dust emissions from construction (activities) vehicles and machinery	• Side enclosure and covering, by impervious sheeting, of any aggregate or other dusty material stockpiles; • Dusty vehicle loads transported to, from and within the Project site should be covered by sheets and should not be overloaded; • Use of water sprays to decrease dust generation from earthworks; • Proper and efficient operation of construction machinery and vehicles by qualified workers; • Regular maintenance and inspection program for all construction vehicles; • Minimize unnecessary operation of construction machinery including efficiency of trip times; • Daily visual checks to ensure the above points are followed, particularly in regards to smoke emissions from vehicles and machines. Equipment generating smoke should be given defect notices and taken out of service until repaired and approved for re-deployment by site supervisor.	- CC - CS - EO
Increase water demand for contsruction purpose	• Avoid excessive use of the water or water wastages	- CC - CS

	• Roof catchments should be provided with gutters to facilitate collection of the run-off. • This water should be stored for general use i.e. cleaning, firefighting, gardening etc. • Sufficient storage water tanks should be provided. • Encourage water reuse/recycling mostly during construction and occupation phases.	- EO
Impacts on archaeological and cultural property	• Solicit services of archaeologist for identification of any findings during construction activities; • In case any archaeological artefacts or relics are found, the contractors will cease work immediately and inform the District and other entity in charge; • Train the construction workers to stop working immediately if there are any signs for historical or cultural sites (like bones, tone shards, metal works, etc) visible.	- CC - CS - EO -
Soil and water pollution from spills and poor management of oil, fuel and lubricants, vehicle maintenance garages and fueling areas, which may lead to contamination of	• Open stockpiles of construction materials (e.g. aggregates, sand and fill material) on site should be covered with tarpaulin or similar fabric during rainy season; • Measures should be taken to prevent the washing away of construction materials, soil, silt or debris into any drainage system; • All machinery and equipment be regularly maintained and serviced to avoid leak oils;	- CC - CS - EO

soil, Underground water through leaching and ground water if it joins the storm drains.	• Maintenance and servicing of vehicle, machinery and equipment must be carried out in a designated area (protected service bays) and where oils are completely restrained from reaching the ground. Such areas should be covered to avoid storm water from carrying away oils into the soil or water systems. Waste water/ wash water from these areas should be properly disposed; • Oil products and materials should be stored in site stores or in the contractor's yard. They should be handled appropriately to avoid spills and leak; • Car wash areas (in case happen at site) and other places handling oil activities within the site must be well managed and the drains from these areas controlled. • There should be no flooding within the site at all to prevent seepage of contaminated water into underground water sources; • All applicable national laws, regulations and standards for the safe use, handling, storage and disposal of hazardous waste to be followed; • Storage sites for petroleum products to be secured and signs to be posted which include hazard warnings, who to contact in case of a release (spill), access restrictions and under whose authority the access is restricted will be posted; • Areas dedicated for hazardous material storage shall provide spill containment and facilitate clean up through measures such as dedicated spill response equipment.	

Revenue to Government	Ensuring all business transactions are conducted legally. Everything bought should have EBM bill to make sure that VAT is paid to the government.	- CC - CS
Fire hazard at the construction site,	• Fire extinguishers must be available on the site • Every worker should know how to use fire extinguisher • Flammable products must be kept under shade, in ventilated area and far from fire. • Post "**NO SMOKING**" signs in the area. • In case of fire incident, Department of fire brigade in Rwanda National Police must be informed immediately for help. • Use quality approved by RSB of cables during electrical installation • Electrical installation must be done by licensed electrician (either individual or company) as regulated by RURA Classes of electrical installation permit: • **Class A:** For electrical installation for residential premises not exceeding five bedrooms and reparation on equipment of up 230V • **Class B:** For electrical installation for multi-storied buildings, other big bungalows and mansion of complex design and commercial buildings, installation of light plants up to a level of 400V and any work under class A. • **Class C:** For Low voltage and medium voltage connections up to 30kV and any work under class B. • **Class D:** For electrical installation systems designs and installation in specialized field like switchgear, centralized heating, refrigeration, and generator sets and solar systems. • **Class Z:** For electrical installation of any plants up to and including high voltage (70kV and above) and any work under class C.	- CC - CS - EO - RNP - RURA

IMPACTS DURING OPERATION PHASE		
Impacts	**Proposed mitigations/Remarks**	**Responsible**
Effluent generation and possible water quality degradation	• Install Effluent Treatment Plant (ETP) for industrial wastes (as described in section 2.9.3 of this report). • The treated water will be of acceptable standard, chlorinated and will be used on site for irrigation of gardens, washing cars or serve others purposes. • Explore technological options that promote usage of less water to reduce wastewater generation at source. • Contract reputable professionals to conduct regular inspections and maintenance works on the bio-digester • Install water saving systems e.g. self-closing taps and deploy water conservation signage	- The project - RURA - REMA - RSB
Sludge formation from the ETP	• It is common practice that after every year of operation, the system is desludged to refresh its calibrated performance. Desludging and disposal of sludge in Rwanda is only authorised for companies registered by RURA. The developer will identify a company registered by RURA to desludge and dispose sludge in precautious means, to perform this duty every end of the year. This period may be reduced depending on the depreciation of the system. • Parameters of the treatment levels will be occasionally taken to determine whether the system requires earlier desludging.	- The project - RURA - REMA - Registered disposal sludge company

Noise generation	• Deploy acoustic screens around noisy areas • Provide appropriate PPE to workers exposed to high noise levels • Deploy only muffled machinery for use at the facility • Monitor noise levels at the facility and fully comply with the permissible noise limits as specified in Rwanda Noise Level Standards (RNLS) • The noise standards for Rwanda are the following according to different areas/zones: ➢ **Industrial area: 75 db (day time) and 70 db (night time)** ➢ Commercial area: 65 db (day time) and 55 db(night time) ➢ Residential area: 55 db (day time) and 45 db (night time) ➢ Silence zone: 50 db (day time) and 40 db (night time)	- The project - RURA - REMA - Registered waste disposal company

Air pollution	• Only serviceable machinery which meets emission standards should be used at the site • Use only low Sulphur and unleaded fuels to curtail emission of GHGs • Only inspected HCVs by Rwanda National Police (Controle technique) shall be allowed to work with the industry • Daily visual checks to ensure the above points are followed, particularly in regards to smoke emissions from vehicles and machines. Equipment generating smoke should be given defect notices and taken out of service until repaired and approved for re-deployment by site supervisor; • Air Pollution Control (APC) device must be installed at the top of plant chemny to allow monitor check the quality of emission from plant operation.	- The project - REMA - RNP
Increased water demand	• The proponent will Install water saving systems e.g. self-closing taps and deploy water conservation signage • Make structural provisions within the development plan to harness rain water. • Water use will be metered for monitoring of usage and identifying wastage incidents. • Recycle the treated water from the bio-digester for re-use in external cleaning and fire- fighting	- The project

	• Use of collected storm water for irrigation of gardens, cleaning and washing as opposed to WASAC supplied water.	
Increased demand for electricity	• Exploit renewable energy sources e.g solar to supplement mains supply. • Electricity use will be metered for monitoring of usage and identifying wastage incidents • Install compact fluorescent lights in high use areas – they last longer and use 75% less energy than normal light bulbs. • The proponent will monitor energy use during operations and maintain records	- The project
Solid waste	• The proponent shall provide waste segregation bins strategically designed to encourage the separation of wastes at source to promote re-use and re-cycling, • Hazardous wastes (including e-waste) should be segregated out by providing separate collection containers and educating the personnel on how to identify hazardous materials. The separated hazardous waste should be temporarily stored in area located far from any main drains, and respect the following items (impermeable bases, bunding, fencing and ideally also have a covering to protect from sunlight and rain). After temporarily storage, waste should be shipped by accredited company for final treatment/disposal. • Designate a dedicated waste collection area sheltered away from scavengers and wind action • Contract a licensed waste handler to manage the wastes	- The project - REMA - Registered waste disposal company

Leachate from the garbage dump	• Garbage collection facility will have a concrete floor to avoid any leaching into the soil. • Prompt collection of garbage will be adhered to ensure that garbage is collected from the estate before it decomposes.	- The project - RURA - REMA - Registered waste disposal company
Employment opportunities	• Wherever possible, local qualified people will be considered for job opportunities. Adequate occupational health and safety standards should be provided to ensure the work environment is conducive.	- The project
Fire hazards	• The proponent will develop and implement a tailor made fire action plan for the facility • Firefighting equipment such as extinguishers and fire hydrants will be provided • Regular maintenance of extinguishers is recommended (every 6 months); • Regular checks and rectifications of electric insulation and installations; • Fire training and drills will have conducted on a scheduled interval • Provide for dedicated fire exits and a strategically situated fire assembly point	- The project - RSB - RURA - RNP - Insurance companies -

	• Fire alarms to be displayed in each room • In case of fire disaster, project management is advised to contact as soon as possible Rwanda National Policy (fire brigade department) for quick help; • The whole project should be insured by fire insurance (fire insurance is mandatory). • Use quality approved by RSB of cables during electrical installation • Post "**NO SMOKING**" signs in the area.	
Structural safety and insecurity	• The proponent will hire adequate security personnel from a reputable company • Installation of CCTV cameras and alarms on and along the entrance and exit from the development • The proponent shall consider building of a boundary wall to ensure security of the facility. • The proponent shall ensure that construction is done as per the approved drawings. • The building will be constructed strictly to engineers' details and prescriptions in terms of materials quality and time frame to ensure no risk of building collapsing. • Fire exteguishers & hydrants to be available in each section and to be maintained regularly.	- The project - RSB - RURA - RHA
Occupational Safety and Health	• Train workers in the facility and conduct constant awareness programme concerning workplace hazards • The operators should be provided with full safety gear (PPE) and trained on occupational health and safety in line. • Fire-fighting equipment should be provided at strategic points and First aid kits should be provided.	- The project - RSB - RURA - RNP

	• Provide documentation of all incidences and accidents occurring on the site including near misses. • Develop an effective Emergency Response Plan and enlighten the staff on safety measures and procedures through training. • Conduct annual health and safety audits and implement recommendations • Clear signage will be posted alerting possible danger situations. • The proponent should make sure that every employee has health insurance including Mutuelle de Sante.	
Traffic increase	• Adequate parking and loading/offloading space has been provided for in the design of the development • Trucks will only be parked loaded/offloaded at designated parking areas • Erect speed limit signage and hazard demarcations along the access road • Compel drivers to comply with recommended speeds.	- The project - RNP
Management of rainwater, roof and groundwater	• Rain water from roof to be connected to water storage tank. Stored water should be used in cleaning activities, washing and irrigation of gardens; • The Project employs the LID (Low Impact Development) strategy to control water at the source; • Rainfall and storm water run-off will pass through of a decentralized system that distributes storm water across the Central Green Spine and replenish groundwater supplies instead of sending it into a system of storm drain pipes	- CC - SC - The project

	and channelized networks that control water downstream in a large storm water management facility. • This LID strategy will enable the estate to prevent degradation of water quality and natural resources, to manage storm water more efficiently and to manage the costs effectively. It will also protect groundwater and drinking water supplies, and create beautiful, healthy well landscaped; • Apart from the above solutions, rainwater will be channeled to the public drainage system (along the existing asphalt road).	

7. ENVIRONMENTAL MANAGEMENT PLAN (EMP)

The Environmental Management Plan (EMP) aims to make the project in conformity with the applicable environmental legal.

This Environmental Management Plan comes to complete the information given for the environmental impacts and the mitigation measures proposed in the previous chapters. It proposes the institutional responsibilities for the implementation of the mitigation measures, the implementation indicators, the time frame for monitoring and follow-up and also the estimated cost for the implementation activities.

The developer should pay particular attention to identifying and recommending measures or practices for avoiding, mitigating or managing negative impacts of the project and for enhancing potential environmental and socioeconomic.

7.1. Environmental Management Plan for the construction phase

Activity	**Requirements**	**Proposed mitigation measures**	**Cost**	**Responsible for monitoring**	**Monitoring indicators**
Soil erosion management	Site plans indicating the area phases to be excavated	Phased excavation of the plots to avoid opening big chunks of land at once	Cost covered in the design	Developer/Contractor / District	Hips of murrum on site not disposed off responsibly, storm water carrying large volumes of mad from the site and flooding those downstream.

	Strictly followed implementation schedules of site excavation	Fast tracking of the project works to avoid keeping plots open for long	Not applicable	Developer/Contractor	Hips of murrum on site not disposed off responsibly, storm water carrying large volumes of mad from the site and flooding those downstream.
	Ground compacting equipment	Compacting of excavated area to minimize erosion effect	Cost covered in the design	Contractor/Developer / District	Compacted ground with less dust raised and no mad.
	Storm water management plan	Rainwater harvesting has been incorporated and recycled water has been exploited for landscaping and other external uses as far as possible.	Cost covered in the design	Developer/Contractor	Hips of murrum on site not disposed off responsibly, storm water carrying large volumes of mad from the site and flooding those down stream.
Dust management	Water trucks and spray pumps	Water will be sprayed during excavation to avoid raising dust	$ 10,000 (to be adjusted)	Developer/Contractor	Compacted ground with less dust raised and no mad

on and from the site	Site plans indicating the area to be excavated Strict implementation schedules for site excavations	Phased excavation of the plots to reduce on the amount of dust coming from the site at a given time.	Cost covered in the design	Developer/Contractor	Compacted ground with less dust raised and no mad
Noise management	Daily work plans/schedules	The contractor will avoid working at awkward hours e.g. when people are sleeping. Proposed working hours are 6 am to 6 pm.	Not applicable	Developer/Contractor	Noise nuisance at night or non-working hours.
	Delivery schedules of materials on site	Materials will be delivered in the early morning or late afternoon hours when there is minimum human activity in the area.	Not applicable	Contractor/Developer	Delivery of material at late nights is a sign of poor schedules.

Management of exhaust fumes	Provision of proper documentation on different machines and heavy trucks.	Ensure that all vehicles and machines have valid certification from the National "Centre de Contrôle Technique Automobile" of their mechanical conditions.	Not applicable	Developer/contractor / centre de controle d'automobile technique	Emission of thick smoke of exhaust fumes such as; CO_2, CO_x, NO_x gases that are dangerous to human health
Solid Waste management	Collection and disposal of construction wastes/debris	Collection of waste bins and disposing of waste at properly designated dumping sites	$ 500	Developer/contractor / Sector/ REMA/ RURA	Solid waste litter on premises is an indicator of mismanagement. Poor hygiene in regard to unclean toilets is another indicator of sanitary issues. Cleaner technology techniques such as; housekeeping, sorting waste at the source, Reuse, reduction of waste at the source.
	Provision of waste dumping facilities	Proper dumping places located inside the construction site will be used to handle waste from the site	$500	Developer/contractor /Sector/ REMA/ RURA	
	Provision of sanitary facilities	Mobile toilet facilities (two for men and other two for women) will be installed on site for the use by the workers during construction;	$ 2000	Developer/contractor / REMA/ RURA	

		Clean production techniques of separation of waste at the source shall be introduced to workers on the premises.	Not applicable as it is unquantifiable	Developer/contractor	
Safeguard policy for the workers on site	Safety procedure manual on site to be followed	A safety officer to ensure that all workers wear safety gear that include; Safety boots, helmets, overalls, leather gloves, safety belts, nose masks and eye goggles, among others. First Aid kit exclusive at the site and rescue vans in the vicinity in case the injured require to be transported to nearby health center or hospital.	Part of project budget	Developer/contractor	Proof of Insurance certificate for injuries or possible deaths caused by activities on site. Workers dressed in safety gear. First Aid kit available on site. Safety officer assigned this duty.

Prevention of oil spillage and fire outbreak management	Avoidance of oil spillage that degrades soil and may cause fires. Fire escape exits and provision of fire extinguishers	Use of vehicles, trucks and equipment in good mechanical condition, checked by the "Controle technique d' automobile", that hardly have oil leaks. Regular checks of these machines shall be done to ensure they are in recommended conditions. Directions should be well marked out for fire escape exits and location of fire extinguishers. Installation of fire extinguishers at easily accessible points of the site.	Catered for in the contractor's obligations and therefore not applicable	Developer/contractor	Presence of fire extinguishers. Sign posts indicating fire escape exits and Assembly point.

Security management of the site and neighbourhood	Security assurance of the neighbourhood	Hoarding of the site with transparent fencing nets or iron sheets where construction is happening and where construction material is kept. Street lights used at night and night security guards hired. Financial contribution to Umudugudu night security guards "umutekano"	Included on construction budget under site installation. $ 1000 per year	Developer/ Cell Executive Secretary	Presence of security lighting throughout the night. Site hoarded with transparent nets or iron sheets around its boundaries. Presence of security guards day and night.

7.2. Environmental Management Plan for the operation phase

Activity	Requirements	Proposed mitigation measures	Cost	Responsible for monitoring	Monitoring indicators
Wastewater management	Treatment of wastewater	A centralized ETP should be installed. The designer should consider a ETP which should at least manage waste of whole factory. The proposed ETP will be able to treat 50 m^3 daily.	Included in project budget	Developer/contractor/ REMA/ WASAC/ RURA	Monitoring if final effluent meet with RSB limits. Monitoring devices should install on ETP outlet
	Use of treated wastewater for the irrigation of the estate gardens	The treated water will be chlorinated to the acceptable standard and will be used at the estate for irrigation of gardens	Covered in the design costs of the system.	Developer	
Management and monitoring of ETP	Proper maintenance of the ETP	After construction of a centralized ETP, the contractor shall offer after sale services of intensive maintenance training for a month to personnel that will be responsible for the system.	$ 1000 per month for maintenance services.	Developer/contractor/ REMA/ RURA	Presence of the ETP system or an equivalent system.

		After negotiations, the developer may agree to periodic check-up by the company agents on performance of the system.			
Sludge formation from the Effluent treatment plant(ETP)	Desludging of the ETP system and proper disposal of this sludge	• It is common practice that after every year of operation, the system is desludged to refresh its calibrated performance. Desludging and disposal of sludge in Rwanda is only authorised for companies registered by RURA. The client should identify a company registered by RURA to desludge and dispose sludge in precautious means, to perform this duty every end of the year. This period may be reduced depending on the depreciation of the system. • Parameters of the treatment levels will be occasionally taken to determine whether the system requires earlier desludging.	$ 2000	Developer/contractor/ REMA/ RURA	Obnoxious smell from the system. High sludge return rate. Proof of frequency of desludging from the log book of daily activity registration at the plant.

Solid waste management	Collection and disposal solid waste management	Solid waste will be collected in garbage bins placed at various locations within the site. A contract will be signed with local garbage collectors registered by RURA to dispose the waste at officially gazetted premises.	N/A $ 1000 per year.	Developer/ Employees/ waste disposal company hired/ REMA/ RURA	Solid waste litter and garbage hips on the premises is an indicator of mismanagement.
	Collection and disposal of organic waste such as; food left over and other wastes	Collection of leftover food in bins for safely disposal in proper dumping facilities		Developer/ Employees/ waste disposal company hired/ REMA/ RURA	Solid waste litter and garbage hips on the premises is an indicator of mismanagement.
Dust management in the settlement	Provision of green areas	Green areas and other vegetation cover are provided between the open parking areas and on other areas where it is possible.	Covered in the design costs	Developer/ contractor	Clean green compound, walk ways and parking. Well compacted grounds.
	Paving of walk ways	The parking areas will be paved with interlocking blocks thus minimizing erosion effect as well.	Covered in the design costs		

Energy consumption management	Sustainable use of energy and water resources	Through maximum exploitation of natural resources such as sunlight, rainwater and wind, the project facilitates maximum savings in energy and water for lighting, air-conditioning, ventilation, maintenance, etc. the project has achieved an energy efficiency that focuses on minimizing energy use associated with the use of the buildings and during passive times. Utilization of natural lighting, building position, photovoltaic cells time switches, energy saving luminaires. The designs should explore and find the appropriate level of renewables such as solar hot water or stand-alone solar street lighting for example.	Included in project budget	Developer/ contractor	Presence of Energy saving bulbs, solar panels for water heating, etc.

Fire outbreak management	Safety guidelines for fire outbreak control	Fire escape exits, with directions to these fire exits. Installation of fire extinguishers for every room and stands for use and must be fixed where everyone can see them. Water sprays should be available across the whole factory and its all components. Routine trainings of management staff on handling emergences like these.	$ 1000 for each fire extinguisher $ 1000 for smoke detectors and sprays.	Developer/ contractor/ RNP fire brigade	Presence of fire extinguishers. Sign posts indicating fire escape route.

Noise management	Daily activities plans/schedules	• The project must deploy muffled machinery • Works that can cause high noise, should be done on day shift to avoid neighboring disturbance. • Maintenance of equipment will help to keep noise levels down. • Ear muffs should be used by all workers into the plant and other noisy area • Noise levels should be monitored regularly (Biannually) to ensure compliance with national standards (Industrial area: Day time= 75 dB and Night time= 70 dB)	Not applicable	Project manager/RNP / Sector	Noise nuisance at night.

8. Conclusion and Recommendations

8.1. Conclusion

The proposed project is considered important and beneficial to both the proponent and the general public. The negative impacts expected to arise during all the phases of the project can be managed to satisfactory levels that do not warrant significant environmental degradation. Additionally, the proposed development is located in an industrial park and is well accommodated within Rwamagana area

The foreseen environmental impacts are all mitigatable, through the proposed measures, to levels of low significance environmental damage and socially tolerable impacts.

8.2. Recommendations

It is therefore the recommendation of this report that the project be allowed to proceed on the basis that the environmental management plans for the project is fully implemented, monitored and that follow-up is made to ensure compliance as may be directed by REMA and relevant lead agencies.

Based on this study, the following recommendations are made:

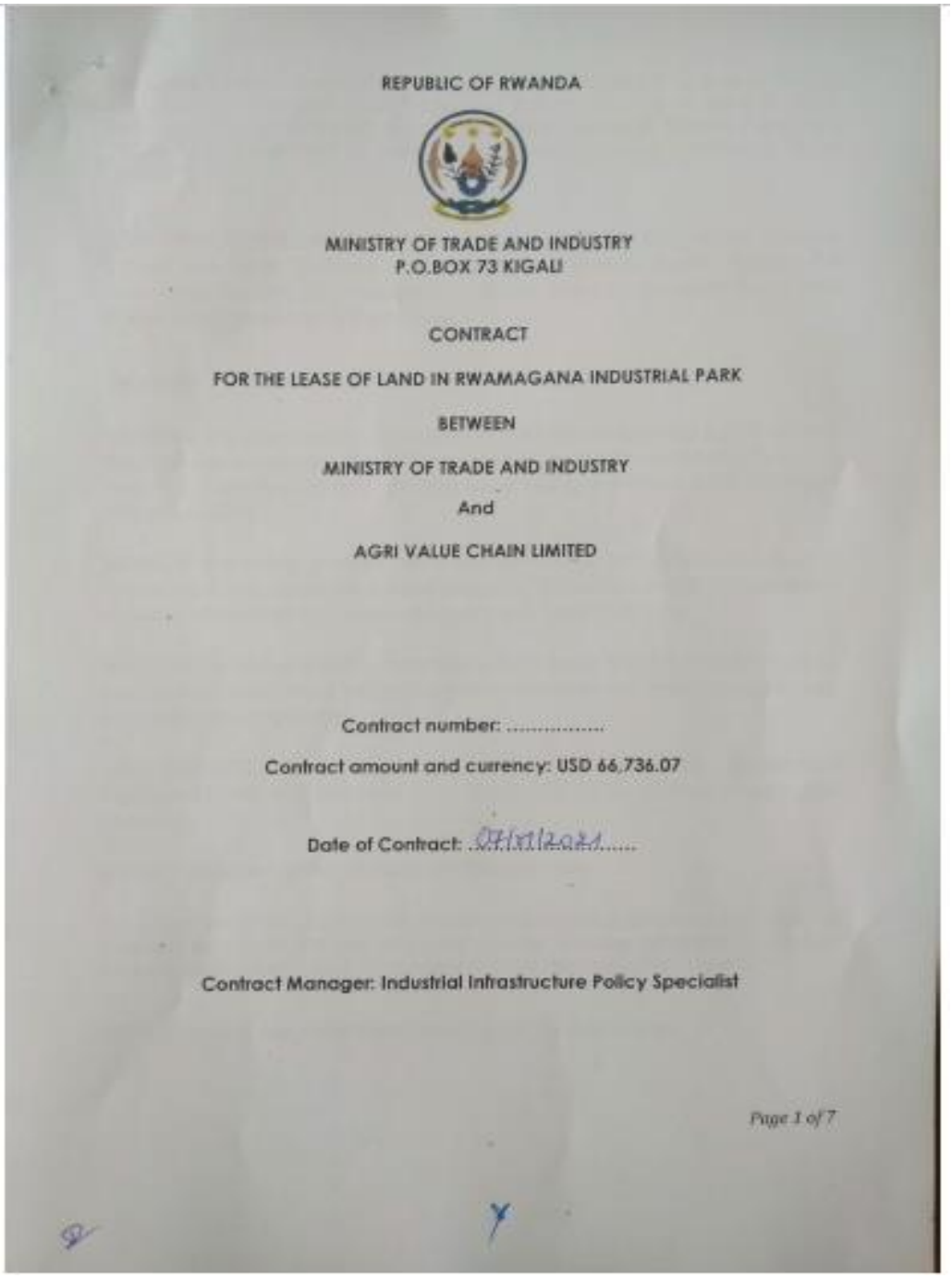
- The site shall be fenced before and during all construction activities and all works shall be carried out during the day (7:00 am-6:00 pm) in order to avoid the noise pollution and accidents from the construction works;
- Protecting equipment like face masks, gloves, safety boots, etc. must be provided to workers during construction phase ;
- In order to prevent the dust pollution during the construction, the soil shall be watered;
- The rain water from the site and the building shall be collected and harvested in centralized water tanks for reusing;
- Solid wastes shall be managed by segregating the wastes at their production point (segregation at source) according to their type and each type of waste shall have its

appropriate treatment. Ensure organic waste is collected and stored separately from other waste to enable composting and/or use for soil amendment.

- A contract with a private company for solid waste and sludge collection and disposing of, shall always be in place. For solid waste, contracted company should collect waste on daily basis;
- Fire extinguishers (both hydrant and CO_2) must be available across the project site and must be active.
- Avoid noise during night and generator must installed in sound proofed room.
- The construction workers should have a First Aid kit for the first aid assistance in case of accident occurrence;
- Subscribe the project (all phases) against fire with an approved insurance company;
- Fire exteguishers & hydrants to be available in each section and to be maintained regularly;
- Engineering inspection and test to be done before operation of the plant to ensure that it is strong enough and can't be damaged in different ways.
- Professional Security company must be mobilized full time at the plant to ensure that all facility is safer;
- CCTV to be installed as well for security purpose.

9. Annexes

Annex 1: Contract of lease of land



REPUBLIC OF RWANDA

MINISTRY OF TRADE AND INDUSTRY
P.O.BOX 73 KIGALI

CONTRACT

FOR THE LEASE OF LAND IN RWAMAGANA INDUSTRIAL PARK

BETWEEN

MINISTRY OF TRADE AND INDUSTRY

And

AGRI VALUE CHAIN LIMITED

Contract number: .....

Contract amount and currency: USD 66,736.07

Date of Contract: 07/01/2021

Contract Manager: Industrial Infrastructure Policy Specialist

Page 1 of 7

This Lease Contract hereinafter referred to as the "**Contract**" is entered into by and between the Ministry of Trade and Industry, having its office in Kigali-Rwanda, P.O.BOX 73 KIGALI, duly represented by **Michel M. SEBERA**, Permanent Secretary of the Ministry of Trade and Industry (Hereinafter referred to as the "**Lessor**")

AGRI VALUE CHAIN LIMITED having its address at P O Box 6960, Ndera, Gasabo, Umujyi wa Kigali, Rwanda represented by **Rajneesh Kumar Dabral**, the Managing Director, with Passport/ID Z 4B1196 issued by the Republic of India (Hereinafter referred to as the "**Lessee**")

PREAMBLE

WHEREAS: The Lessor desires to implement the national industrial policy towards the increase of domestic production for local consumption, improving Rwanda's export competitiveness and creating an enabling environment for Rwanda's industrialization;

WHEREAS the Lessor currently owns the land more particularly described in Article I and has launched a lease process in accordance with the guidelines issued by the Ministry of Trade and Industry and applicable laws;

WHEREAS the Lessee is willing to lease the land located in the industrial park at the contract price and is willing to abide by the rules and regulation governing industrial parks in Rwanda.

NOW THEREFORE, in consideration of the mutual covenants and agreements contained herein and intending to be legally bound, the parties hereby agree as follows:

Article 1: Objective of the contract and Effective Date

The objective of this Contract is to grant to the Lessee a leasehold title over the **Industrial land of 20,000sqm**, plot number/Index Number **M12&M13** located in Rwamagana Industrial Park for a period of thirty (30) years (the "**Land**").

This Contract will come into effect upon signing by both parties.

Article 2: Price

The Contract price is Three United States Dollars (USD 3) per square metre using the Banque National du Rwanda (**BNR**) average exchange rate on the date of payment, the Lessee accepts to pay pursuant to the terms stipulated in article 3.

Article 3: Modalities of Payment

Payment in Instalments over five years

The Lessee agrees of the following payment modalities:

1. 30% of the sale price upon signing of this contract;
2. 70% of the sale price paid within a period of 5 years. The annual instalments will be increased each year using the inflation rate. We specify a fixed 5% inflation rate which is BNR's medium term target

The Lessee agrees to use Payment in Instalments over Five (5) Years as payment modality, therefore 30% of the total amount paid is Eighteen Thousand United States Dollars (USD 18.000).

The annual instalments shall take into account a fixed inflation rate of five percent (5%) as specified by BNR's medium term target.

Area leased	current due	installment date	rate/sqm	to be paid
20.000sqm	USD48,736.07	1 Year Later (31/12/2021)	0.44	**USD 8,820**
		2 Years Later 31/12/2022)	0.46	**USD 9,261**
		3 Years Later (31/12/2023)	0.49	**USD 9,724.05**
		4 Years Later (31/12/2024)	0.51	**USD 10,210.25**
		5 Years Later (31/12//2025)	0.54	**USD 10,720.77**
		Total amount paid after 5 installments		**USD 48,736.07**

All payments shall be transferred to Treasury account No. **1100000** Name: **Ordonnateur-Trésorier (OT) du Rwanda** at **National Bank of Rwanda** in **Rwandan Francs**

Article 4: Execution of work

The Lessee shall execute the development works outlined in its business plan (annexed to this Contract as Annex 1) within a period of eighteen (18) months after the date of signature of this Contract.

If at the expiry of eighteen (18) months, the Lessee has not completed seventy five percent (75%) of the development works outlined in its Business Plan without a valid reason communicated to the Lessor, the Lessor in its sole discretion may terminate the contract and withhold thirty (30%) of the payment made pursuant to Article 3 above.

In the event of termination, the price of priority- executed works will be ascertained and reimbursed to the Lessee when the Land is re-leased to another Investor and the Lessee is liable of the cost and expenses of evaluation done by Expert on the Land and properties to be re-leased.

Article 5: Force Majeure

5.1: No Breach of Contract

The failure of a Party to fulfil any of its obligations hereunder shall not be considered to be a breach of, or default under, this Contract insofar as such inability arises from an event of Force Majeure, provided that the Party affected by such an event has taken all reasonable precautions, due care and reasonable alternative measures, all with the objective of carrying out the terms and conditions of this Contract.

5.2: Extension of Time

Any period within which a Party shall, pursuant to this Contract, complete any action or task, shall be extended for a period equal to the time during which such Party was unable to perform such action as a result of Force Majeure.

Article 6: Obligations of the Lessor

Upon signing of this Lease Contract, the Lessor shall submit to the Lessee, the necessary title documents required to perfect the leasehold title and take lawful possession of the Land.

Article 7: Obligations of the Lessee

The Lessee may only use the Land for the purpose of industry development and undertakes to abide by the existing policies, laws, guidelines and master plan for industrial park development.

The Lessee shall be responsible for the management of solid and liquid waste produced from his/her premises and will be responsible for complying with all applicable requirements for preserving the environment.

Article 8: Contributions on infrastructure upgrade

The Lessee shall contribute to infrastructure upgrades, management costs and payment of maintenance fees through a cost-sharing mechanism with a private developer/operator in proportion to the plot size once the Industrial Park Infrastructure has been further developed and operations have been handed over to the private developer.

Article 9: Termination

If the Lessee fails to meet any of its obligations under this Contract, the Lessor reserves the right to terminate this Contract and withdraw the land rights transferred to the Lessee. The Lessor shall give a thirty (30) days written notice of termination to the Lessee.

Article 10: Law governing the Contract and language

This contract shall be governed by the Laws of the Republic of Rwanda and the language of the contract shall be English. .

Article 11: Dispute settlement

The Lessor and the Lessee will use all possible means to amicably resolve any dispute arising between them in respect of this Contract.

If the dispute cannot be amicably settled by the parties, the matter shall be referred to and finally resolved by arbitration in accordance with the Rules of Kigali International Arbitration Center (KIAC).

Article 12: Miscellaneous Provision

For the other terms that have not been stipulated in this contract, the parties declare that they will refer to the Rwanda Legislation in use.

IN WITNESS whereof the parties hereto have caused this Contract to be executed in accordance with the laws of the Republic of RWANDA on the day, month and year indicated above.

The Lessor

By: _____

Name: **SEBERA M. Michel**

Title: Permanent Secretary

The Lessee

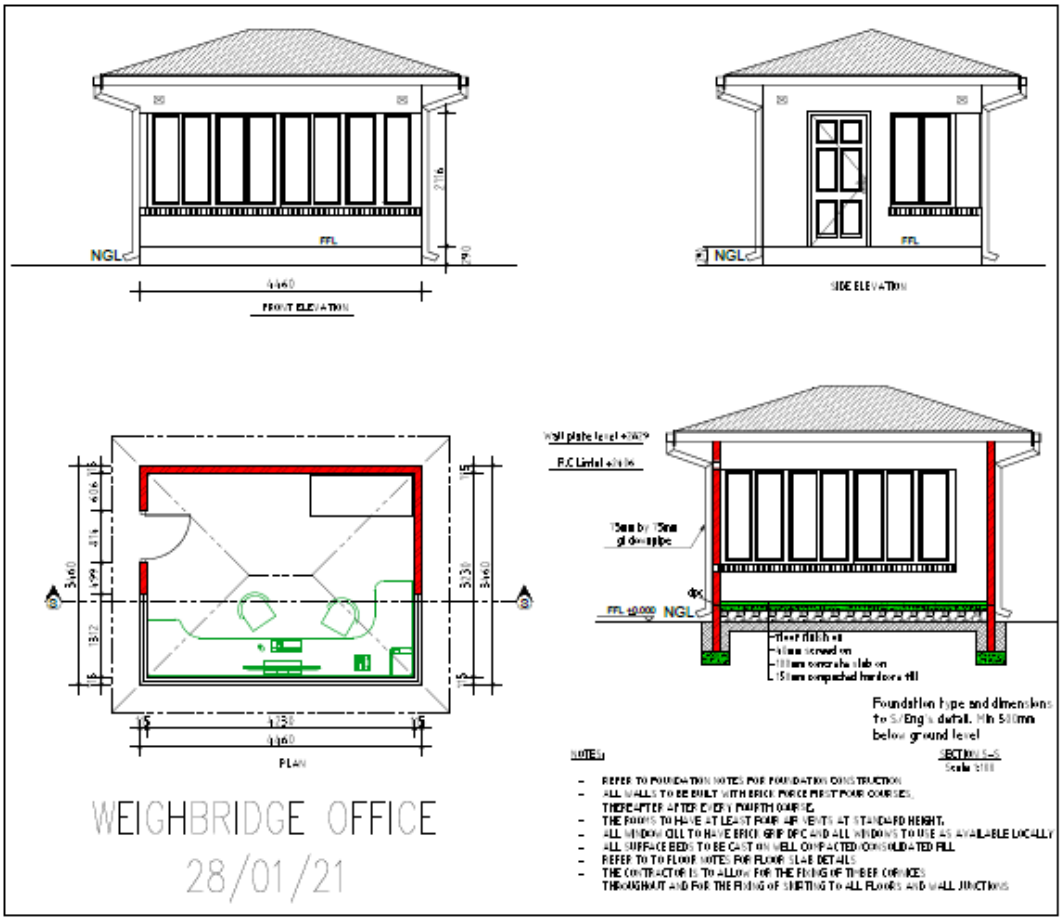
By: _____

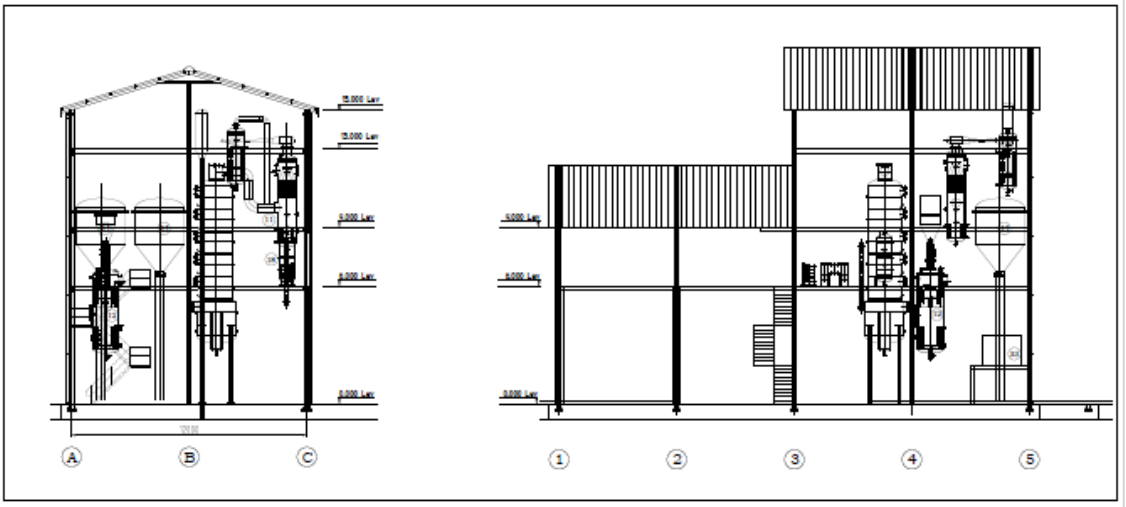
Name: **Rajneesh Kumar Dabral**

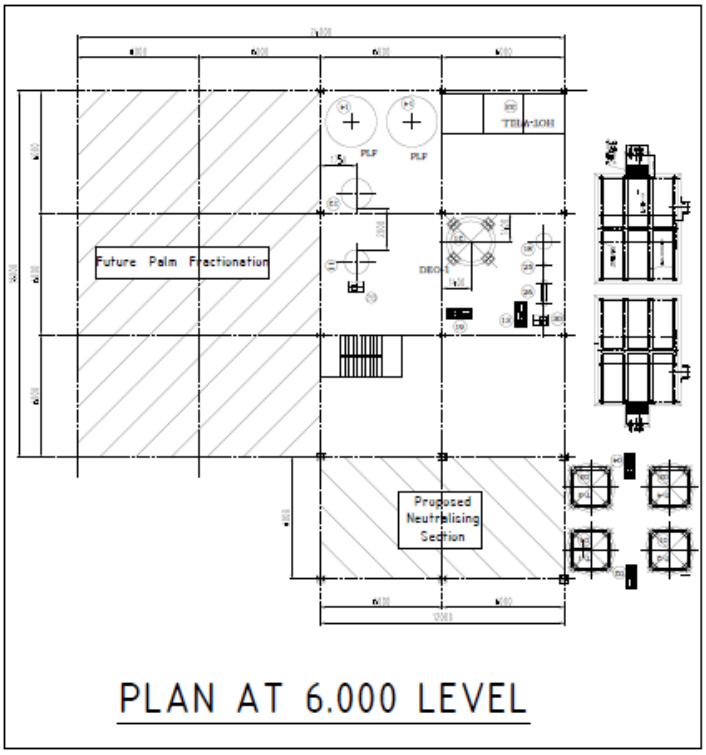
Title: Managing Director

AGRI VALUE CHAIN LIMITED

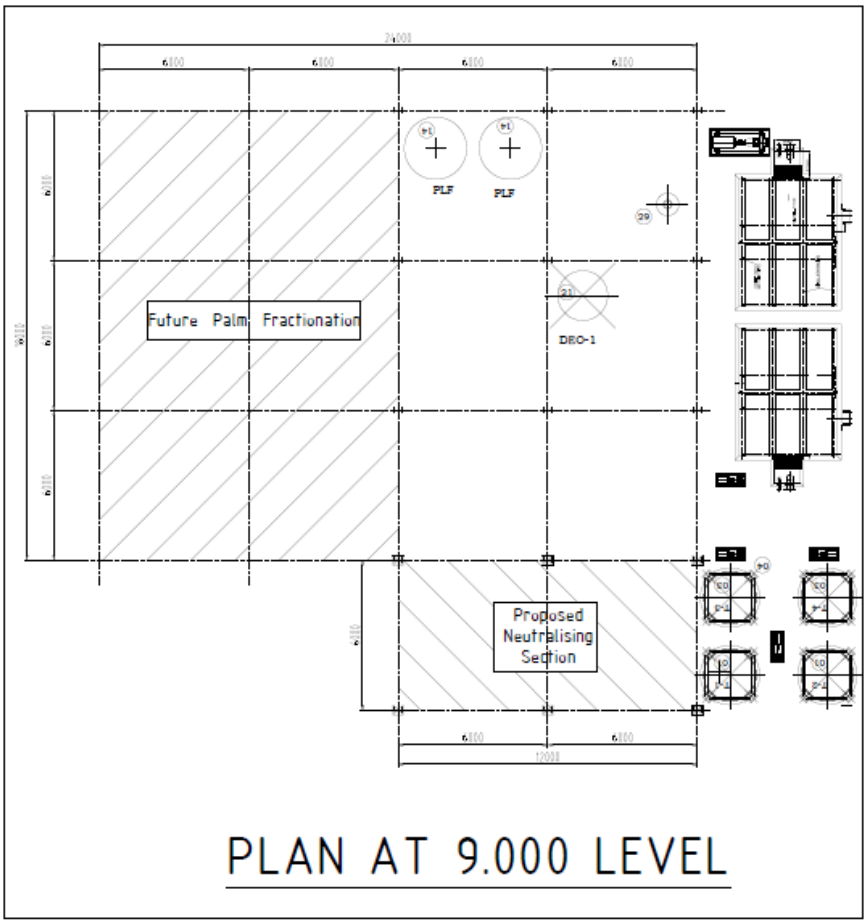
Annex 2: Engineered designs



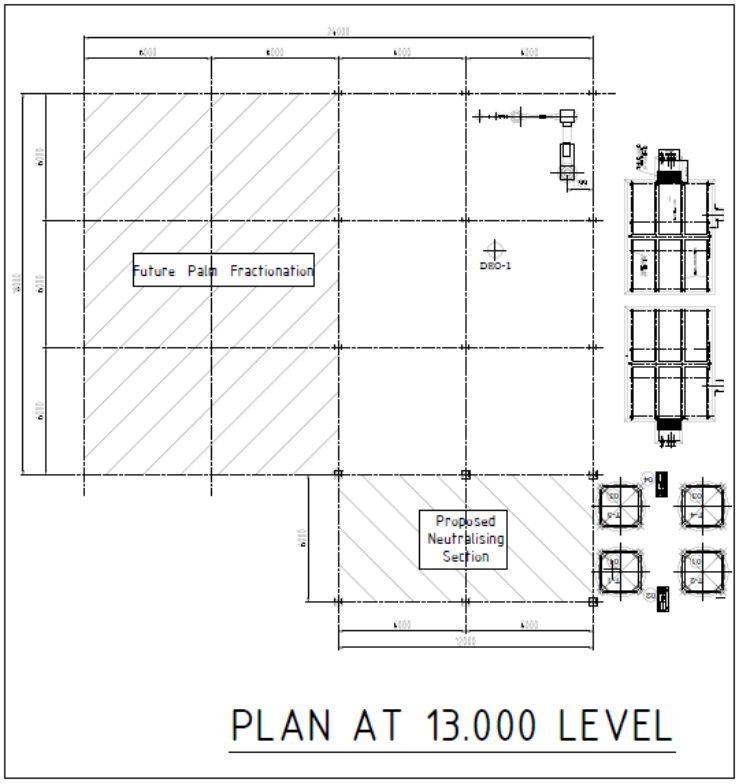


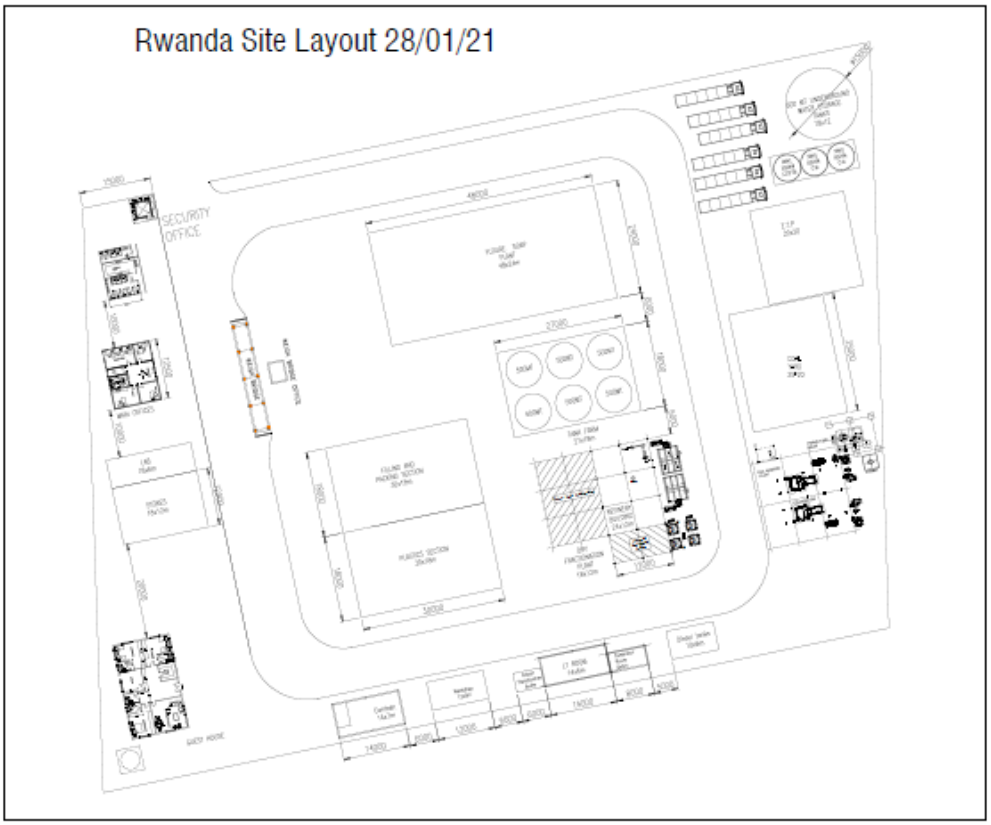


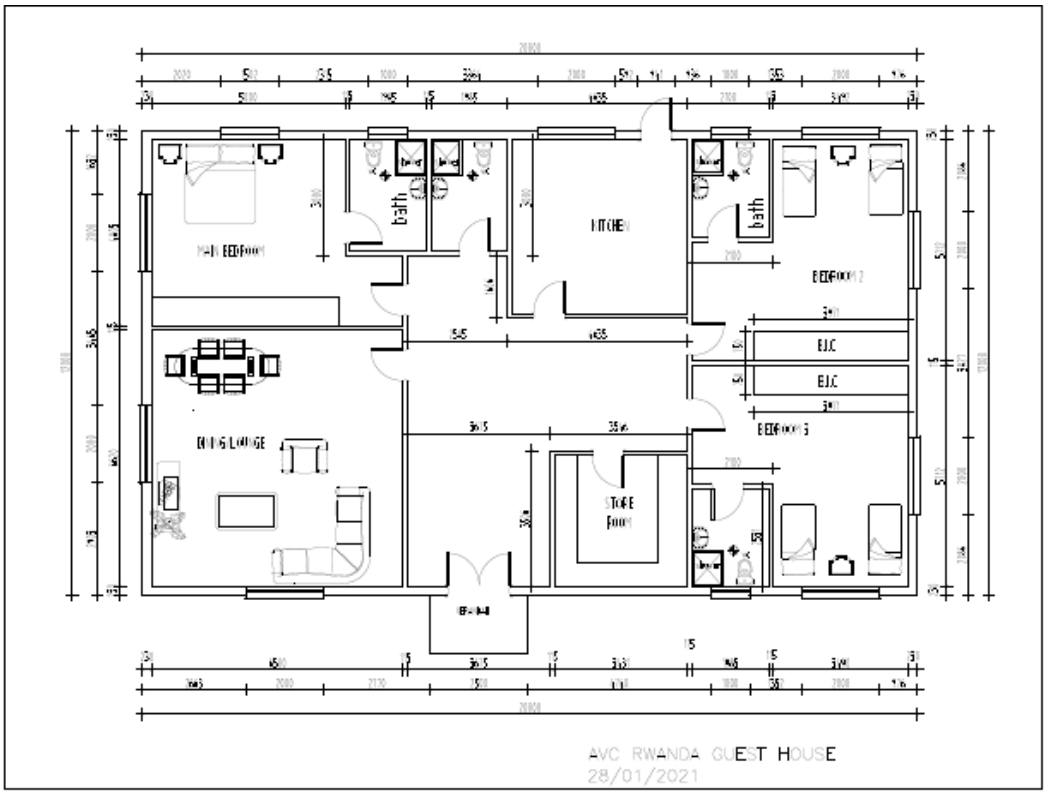
PLAN AT 6.000 LEVEL



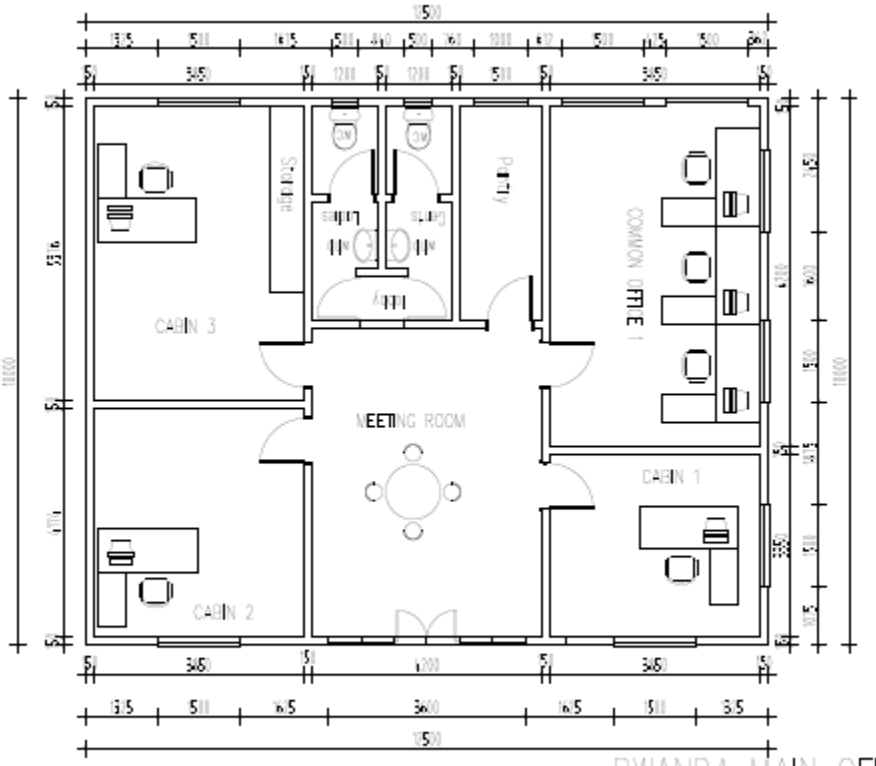
PLAN AT 9.000 LEVEL


Future Palm Fractionation
DRO-1
Proposed Neutralising Section
PLAN AT 13.000 LEVEL

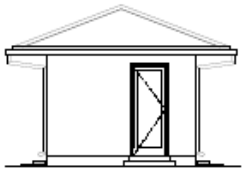

Rwanda Site Layout 28/01/21
SECURITY OFFICE



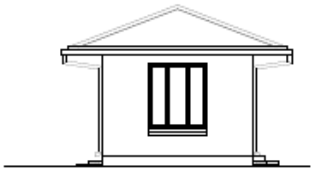
AVC RWANDA GUEST HOUSE
28/01/2021



RWANDA MAIN OFFICE
28/01/21

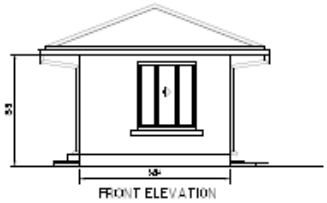


SIDE ELEVATION

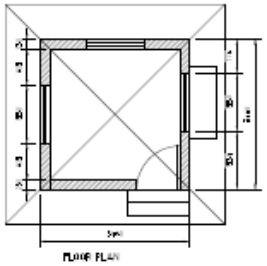


REAR ELEVATION

SIDE ELEVATION



FRONT ELEVATION



FLOOR PLAN

1. ALL WINDOWS TO BE AS AVAILABLE LOCALLY
2. CAVITY OF SHEETS TO BE USED ON THE HIPPED ROOF

SECURITY ROOM FLOOR LAYOUT

1:100

DO NOT SCALE - IF IN DOUBT ASK.							
GENERAL TOLERANCES UNLESS OTHERWISE STATED Sizes up to 600 mm: +/- 1.5 mm sizes over 600 mm , up to 1200 mm : +/- 2.5 mm. size over 1200 mm : +/- 5 mm.					TITLE SECULRITY OFFICE AND TOILET		
					DRAWN	P.M	DRAWING NUMBER
					CHECKED	P.I	
					APPROVED	P.I	
					SCALE		SHEET OF ISSUE JOB No.
					DATE		