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## **12. Products, By-products and Wastes**

This section provides an overview of the products, by-products and wastes to be generated by the power plant. Most of these will be generated during the construction phase of the project while a limited amount will be generated during the operational phase.

### **12.1 Construction Phase**

#### **12.1.1 Products**

The completed footprint will be the primary product of this phase of the project. The footprint will include:

- A power house which houses the ten generating sets;
- An electrical building which will contain the medium voltage switchgear;
- A high voltage (11/66kV) sub-station;
- A treatment house building for treating the HFO, DFO and lube oil;
- A lube oil drums storage shed;
- A bulk fuel storage tank farm for HFO, DFO and lube oil;
- A fire pump station area;
- An administration and maintenance building;
- A vehicle and truck parking area;
- A bulk fuel off-loading area; and
- Other infrastructure including site fencing and gatehouse, foundations for the radiators, boiler stack and exhaust muffler stacks, and, landscaping for the fenced area.

#### **12.1.2 By-products**

By definition a by-product is a substance, which is incidentally manufactured, processed or otherwise used at the facility at any concentration, and released on site to the environment, released to surface waters or transferred off site for disposal.

During the construction phase of the project it is envisaged that the by-products might include any excess construction materials brought to the project site by the contractor which can be reused later.

### 12.1.3 Waste

During the construction phase of the proposed project, several waste products are expected to be generated. These shall include:

#### Domestic Wastes

- The construction workers are expected to be supplied with various forms of foodstuffs packed in plastic or other types of containers. These are expected to occur within the site area and in the immediate vicinity. The management of such waste will need to be incorporated by the Contractor in the Construction HSE Management Plan.
- Other forms of waste include sanitary waste and therefore the provision of sanitary facilities will need to be considered both for the site construction workers and the visiting population.
- Kiosks selling various items will also emerge.

#### Site Construction Waste

The project will generate waste from the site construction activities which includes:

- Demolition wastes;
- Excavated soils and vegetation;
- Construction equipment maintenance wastes;
- Dusts and fumes;
- Scrap metals;
- Packaging materials, etc.

#### Dust

The construction activities that will occur particularly during the site excavation process will generate a considerable amount of dust and other particulates that will be released into the atmosphere.

#### Smoke Emissions

The site machinery, equipment and trucks brought in by the Contractor are expected to generate smoke emissions when in operation during the construction activities. The concentration of emissions will depend on the maintenance levels of the equipment, machinery and trucks used by the Contractor.

## **12.2 Operation Phase**

### **12.2.1 Products**

The primary product of the project during the operational phase will be electricity. This is the product that the Proponent will eventually evacuate to the KP&LC from the power plant. An 11/66kV high voltage sub-station within the battery limits will evacuate electricity to transmission lines that the KP&LC is yet to construct.

### **12.2.2 By-products**

During the operational phase of the project there will be minimal amounts of by-products generated.

### **12.2.3 Waste**

#### **Air emissions**

One of the significant wastes that will be generated by the project is the air emissions arising from the power plant stack emissions. These emissions will require continuous monitoring at locations where the air dispersion modeling indicates higher guideline values than those recommended in the EC Directive 2008/50/EC on ambient air quality. At the time of this ESIA Study, Kenya did not have air quality regulations for thermal power plants.

#### **Noise emissions**

Noise emissions generated by the power plant are considered part of pollution and therefore waste. The design of the power plant incorporates noise levels at the fence line as being those recommended by the WHO.

#### **Effluent Waste**

The project is expected to generate potentially contaminated wastewater from fugitive leaks and spills emanating from the operational process areas. This effluent is expected to be channeled through the drainage system into the OWS for primary treatment. Once treated, the effluent is expected to be discharged into the environment. It will be mandatory for the Proponent to comply with the requirements of LN 120: Environmental Management and Coordination (Water Quality) Regulations, 2006 for effluent discharge.

#### **Domestic Waste**

The daily operations of the facility buildings in which their will be occupancy will generate wastes such as papers and other sanitary wastes.

#### **Sewage Waste**

The employees of the Proponent that will be based within the project area are expected to generate sewage waste which will be channeled through an onsite sewage collection and disposal system.