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POLLUTION PREVENTION AND REDUCTION MANAGEMENT

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1. PRELIMINARY COMMENTS

This document is part of PSG's Health, Safety and Environmental Management System and is the company's Pollution Prevention and Reduction Management Plan. This plan may be revised when deemed necessary by the company.

2. SCOPE

This pollution prevention and reduction management plan is applicable to all operational areas of the company that are potential sources of causing pollution to the environment. The major areas of concern are 'burning' of fossil fuels, waste disposal and agricultural practices. Department Managers together with the Sustainability Team are responsible for the health and safety of the workers working in their departments and for pollution prevention and reduction management activities.

They must familiarize themselves with all pollution prevention measures and reduce waste generation through best management practices at their departments and ensure compliance with instructions at all times. They have to implement proper training on pollution prevention and reduction management practices particularly in material use (chemicals and fuels) and waste management.

3. GENERAL INFORMATION

3.1. Subject

This plan will outline how the company implements its pollution prevention and reduction management.

3.2. Aim

To ensure that the company is in compliance with both the Company's Environmental, Health and Safety policy and national legislation in order not to adversely impact on the environment.


3.3. Objective

- ✓ To ensure that its operations do not pollute the environment (atmosphere and hydrosphere)
- ✓ To guarantee a safe working environment for employees to complete their duties in a safe way, without endangering their health and that of the neighbouring communities.

3.4. Areas of implementation

The three major areas for the implementation of this plan are Workshop, Mill and Plantations. However, this management plan is also to be implemented in every waste generation and management area (Ref: HSE_SOP_010 Waste Management Procedure).

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3.5 Responsibilities

It is the responsibility of every Head of Department to implement this management plan. It is also the responsibility of Heads of Department to educate and train their employees on the policies, procedures and management documents/plans (EMPs) that are developed by the company to prevent or reduce its operational impacts on the environment.

The Sustainability Department is responsible for monitoring, recording and reporting on the results to the relevant regulatory authorities.

3.6 Document control

This is a controlled document titled « Pollution Prevention and Reduction Management », reference HSE_PLAN_003, revision status 1, dated 14 May 2024.

Amendments may be proposed by the Sustainability Department but must be approved by the Managing Director.

If the amendments are relevant, the plan will be modified. After each amendment, the revision status number is incremented.

Only the Sustainability Manager has at his / her disposal the duly signed original document.

All printing works from an electronic file are non-controlled documents and a watermark thus needs to be printed accordingly.

4. **Legal Requirements**

The national legislations applicable to this management plan includes:


- Ghana Standard for Health Control (GS 1222 : 2018) requirements for ambient noise control
- Ghana standard for Environment and Health Protection (1236 : 2019) requirements for ambient air quality and stack emissions
- Ghana Standard for Environmental Protection (1212 : 2019) requirements for effluent discharge
- Environmental Protection Agency Act, 1994 (Act 490)
- Water Resources Commission Act, Act 522 (1996)
- Factories, Offices and Shop Act, Act 328 (1970)

5. **Pollution Prevention and Reduction Strategies**

As a company, our operations can or may cause the following types of environmental pollution;

- ✓ Air pollution
- ✓ Land pollution
- ✓ Water pollution

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Most of these are addressed by the company through its policies, SOPs and management documents/plans (EMPs).

5.1 Air Pollution Prevention and Reduction Management.

PSG will ensure minimal use of fossil fuels by generators and gensets for the generation of electricity. The Workshop will also ensure timely and efficient servicing (Ref: Workshop_SOP_001, 002 and 003) of all its trucks, vehicles and machinery. This will ensure that they are operating at maximum efficiency thereby reducing the consumption of fossil fuels. The company as a matter of policy, will not buy or use over aged trucks, vehicles or machinery. This is to avoid excessive combustion of fossil fuel and ultimately a reduction in the emission of greenhouse gases (CO, CO₂, NO₂, NO_x) that are harmful to the environment.


PSG will use renewable energy through cogeneration from biomass boilers in the generation of power for its mill operations. For isolated areas in the plantations, PSG is using solar energy to generate the minimal power needs of these locations. PSG shall promote natural carbon sequestration through forest enrichment/reforestation programs along riparian and protected areas and intensify monitoring of conservation areas (HCV and HCS) in line with Management and Rehabilitation plan of Riparian Reserves (PLT-OP-PLAN-003) and HCV Management and Monitoring Plans. Actions such as densification of protected areas and reduction in the use of inorganic fertilizer will be carried out to reduce PSG's GHG footprints in the field. In the POM, monitoring of turbine use is done to ensure optimization of renewable energy and reduction of emission from POME by exploring methods to reduce oil loss to effluent. This will reduce organic materials to the effluent ponds, leading to a reduced amount of methane being released. All these strategies are part of the company's Environmental Management Plans (EMPs).

Dust from roads may present an environmental hazard, particularly to those working or living near busy roads. Mitigation measures include:

- Enforcing speed limits (Ref HSE_SOP_009 Drivers/Operators Procedures and Rules) including the construction of speed ramps.
- Diverting roads to avoid residential and industrial areas
- Watering of main roads during the dry season

Noise from operations may present an environmental hazard, particularly for those working near noise generating machinery and equipment. Mitigation measures include:

- Installing noise reducing equipment such as silencers and mufflers
- Maintaining machinery and equipment regularly to minimize noise levels
- Putting noisy machinery and equipment inside a purpose-built building that reduces the effects of the noise
- Redesigning noisy machinery and equipment to reduce noise
- The use of ear plugs.

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Another source of air pollution is the flue gases from the boiler and powerhouses. These contain small amounts of carbon monoxide, carbon dioxide and nitrogen dioxides. There is also particulate matter (unburnt fibre and shell). However, boilers are built with equipment used to remove as much unburnt particulate matter as possible.

5.2 Land Pollution Prevention and Reduction Management

PSG has identified poor or bad waste (solid & liquid) management as a major cause of land pollution. It has therefore developed several policies, procedures and management documents (plans) that will guide its operations in a responsible manner thereby preventing and reducing land pollution. Some of these are:

- Waste management plan (Ref: HSE_Plan_001)
- Waste management procedure (Ref: HSE_SOP_010)
- Environmental management plans (EMPs)
- Chemicals management (HSE_SOP_001)

The company strictly implements these policies, procedures and management documents/plans in order to prevent or reduce land pollution.

5.3 Water Pollution Prevention and Reduction Management

The company further identifies improper waste management and poor agro-chemical handling and application as major causes of water (surface & ground) pollution. In order to prevent or reduce this, the company has developed policies, procedures and management documents/plans to guide its operations. Some of these are:

- Waste management plan (Ref: HSE_Plan_001)
- Waste management procedure (Ref: HSE_SOP_010)
- Environmental management plans (EMPs)
- Riparian/Buffer zone policy/management (HSE_POL_005 and PLT/OP – SOP - 015)
- Chemicals Management (Ref: HSE_SOP_001)

The company ensures that the relevant policies, procedures and management documents/plans are implemented to prevent or reduce pollution of both surface and ground water.


It is also the objective of the company not to engage in the prophylactic use of chemicals and fertilizers. The company intends to reduce continuously its usage of chemical fertilizers once increasing quantities of organic fertilizers are produced from the mill.

6. Monitoring

6.1 Ambient Air Quality and Ambient Noise Level

- This shall be monitored on quarterly basis through measurement by a competent consultant at the mill.

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- This measurement shall cover all gaseous emissions and particulate matter (pollutant) specified in the EPA permit for the mill.
- The measured values are compared with the Ghana Standard Authority requirements for ambient air quality and noise levels to ensure that the company's operations at the mill do not pollute the environment.

6.1.1 Emission Reduction

- Renewable energy use/tCPO or palm product

The POM Manager maintains daily records of CPO produced and energy used in the production process. On a monthly basis, the mill proportionally calculates the renewable energy used in CPO production for each month using the following formula: = $\frac{\text{turbine energy used}}{\text{CPO produced}}$ kWh/tCPO.

Reporting: Maintain monthly records and track changes for progress towards reducing the overall energy consumption or increasing the use of renewable energy sources.

- Direct fossil fuel use/tCPO or tFFB

The POM Manager maintains daily records of CPO produced and fossil directly used in the milling process. On a monthly basis, the mill proportionally calculates the fossil fuel used in the CPO production for each month using the following formula: = $\frac{\text{fuel}}{\text{CPO produced}}$ l/tCPO

Reporting: Maintain monthly records and track changes for progress.

- Estimated fuel use on-site by PSG and contracted transport and machinery operations
- PSG maintains daily records of fuel issued at the various fuel pumps stations. Fuel and lubricant combustion by trucks, vehicles, gensets and other machinery is monitored monthly through Workshop and Mill's Reporting file to identify areas for improvement. PSG from time to time considers replacing older vehicles and machinery with newer, more fuel-efficient models.

Reporting: Maintain monthly records and track changes for progress.

- Electricity use in operations


PSG conducts monthly meter reading for the various houses, stores, mill and offices on-site and maintains cumulative electricity consumptions records. The mill energy use is available on the POM reporting file. When necessary, employees are trained on practices to ensure efficient use of electricity and energy conservation.

Reporting: Maintain monthly records and track changes for progress.

6.1.2 Green House Gas Emission monitoring and reporting

PSG monitors and report publicly its oil palm GHG emissions through RSPO approved palm GHG calculator and rubber GHG calculator for emission through rubber production operations.

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6.2 Water Quality

- Water quality analysis are conducted every quarter by a competent consultant on all rivers and streams traversing the plantations.
- This covers all water quality parameters specified in the EPA permits of the company.
- The results of the analysis are compared with the Water Resources Commission (WRC) requirements for Natural Water bodies (NWB).



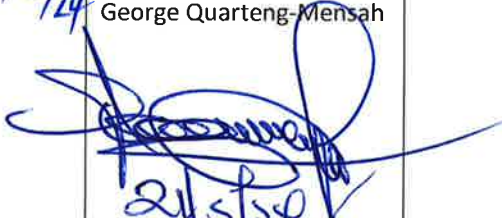
6.3 Waste (Solid and Liquid)

- Solid waste monitoring is done through an excel file on a monthly basis (Ref HSE Reporting).
- The main liquid waste generated is the palm oil mill effluent (POME).
- This is discharged into lagoons for treatment and ultimate reuse in the plantation.
- The POME is analysed quarterly for the effluent quality parameters specified in the mill EPA permit before discharge.
- Used oil from vehicles and maintenance activities is stored in drums in bunded areas and sold to EPA certified companies.

6.4 Phytosanitary Products (Insecticides, Fungicides, Herbicides, Fertilizers, etc.)

- Phytosanitary products use is monitored monthly through HSE Reporting file.

7. Review

Version	Date	Author	Review	Changes From Previous Version
0	20/04/2021	Micheal Wienaar	Josephine Laursen George Quarteng-Mensah	Initial Edition
1	14/05/2024	Micheal Wienaar	  Abdullateef Jimoh George Quarteng-Mensah 	5.1: Addition of action plans and programs 6.1.1: Addition of monitoring requirements per RSPO. 6.1.2: Addition of GHG monitoring plans

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