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The Managing Director,
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INTRODUCTION

1.1 Background

Environmental audit assesses the nature and extent of harm or risk to the environment posed by an industrial process or corporate business activities. In Rivers State there are existing regulations that companies and industries produce environmental Audit Reports of their facilities in compliance with the Rivers State Environmental Protection Laws of 1994 and National Environmental Protection (Pollution Abatement in Industries and Facilities Generating Wastes) Regulation of 1991, No.21.

In compliance with this regulation, mandatory requirement and to check the environmental performance of its operations, the management of Elshcon Nigeria Limited intended to conduct the environmental audit of the marine logistics facility located at Elshcon Road Trans Amadi slaughter Port Harcourt city, for year, 2022.

All industries and facilities generating wastes are required to comply with the regulations and standards below:

I. Guidelines Regulations S.1.8 National Environmental Protection (Effluent Limitation) Regulations 1991.

II. Regulation S.1.9 National Environmental Protection (Pollution Abatement in Industries and Facilities Generating Wastes) Regulation 1991, for example paragraphs 15(2) of the regulation.

III. NESREA Act 2007, the Federal Environmental Protection Agency Act Cap F 10 LFN 2004.

IV. The Rivers State Environmental Protection Agency Edict No. 2 of 1994.

V. Nigeria Upstream Petroleum Regulatory Commission, NUPRC, EGASPIN,2018) Environmental Guidelines and Standards 2018. (Oil and Gas Sector).

1.2 Objectives of the environmental audit study.

The following are the environmental audit objectives:

I. To verifying compliance with national and international standards.

II. To identify environmental problems arising from the marine logistics base operations if any and advice on control measures to be implemented.

III. To measure environmental impact of Elshcon Nigeria Limited operations on every process within the hospitality facility immediate environment.

IV. And to check the operations of Elshcon Nigeria Limited and its interaction with the environment as well as complying with National and Rivers State regulatory requirements.

1.3 Scope of the environmental audit

The EA scope will cover all the operational activities of Elshcon Nigeria Limited in trans amadi base Port Harcourt.

I. Biophysical environment, health and epidemiology and as well socio economics impact, waste characterization and management, energy use, recycling opportunities, accident documentations, emergencies, communication, housekeeping, staff training, etc.

While the terms of reference are:

I. To identify, characterize and quantify the Environmental impact of Elshcon Nigeria Limited operations in order to mitigate any possible adverse effects arising from such development.

II. To produce an environmental audit report in line with the River State Ministry of Environment requirements and in accordance with the Federal Ministry of Environment (FMEnv) Procedural Guidelines of 1995.

2.0 METHODOLOGY

2.1 Site selections

The site for study shall be the stations selected for different environmental components during the site reconnaissance by the environmental consultant.

2.1.1 Sampling points

For a comprehensive EA study of the facility, samples shall be taken as follows:

I. Air quality (5) Samples
II. Soil top and bottom (1) sample
III. Ground Water (1) (Physico chemical, metals and microbiological analysis).
IV. Surface Water (2) (Physico chemical, metals and microbiological analysis).
V. Micro Meteorology Studies (5) Samples
VI. Noise study (5) Samples etc.

2.2 Study approach / Measurement methods.

A multi-disciplinary study approach shall be used for this environmental audit study, this will cover the chemical, physical, biological, health and socio-economic aspects to describe the impact of Elshcon Nigeria Limited operations on the immediate environment. Subsequently, field sample collection, laboratory analysis and report writing shall be carried out under the supervision of the regulators from the Rivers State ministry of environment. All samples will be collected based on the optimum averaging time. All data generated will be collated, analyzed and documented. Some of the methods and the principle of measurement to be used are given below:

A summary of the measurement methods for the air quality, ground,surface water and soil study are given thus:

Suspended particulate matter

An aerocet 531 particle mass monitor will be used to measure respirable and total suspended particle, Measurement will be done by holding the sensor to a height of about two meters in the direction of the prevailing wind and readings recorded at stability.

Noxious gases

Carbon monoxide (CO)

A BW Multi gas Monitor equipped with photochemical sensor will be used for the measurement of CO. The range of detection is between 0.1 – 100 ppm with alarm set at 2.00 and 20.00 ppm. Measurements will be done by holding the sensor to a breathing height of about 1.5 meters in the direction of the prevailing wind, readings will be recorded when the monitor had warmed up sensors and air pumped into the sensor. Reading was taken at stability.

Sulphur dioxide (SO_2)

An Aeroqual Environmental Gas Monitor equipped with infrared sensor will be used for the measurement of SO_2. The technique operates on the principle of dual wavelength IR Absorption, the range of detection is between 0.01 – 1000 mg/m^3 with alarm set at 5.00 and 20.00 mg/m^3. Measurement will be done by holding the sensor to a breathing height of about 1.5 meters in the direction of the prevailing wind readings will be recorded when the monitor had warmed up (3minutes) to burn off contaminants on the sensor and air sucked into the sensor.

Nitrogen dioxides (NO_2)

An Aeroqual Environmental Gas Monitor equipped with infrared sensor will be used for the measurement of NO_2. The technique operates on the principle of dual wavelength IR Absorption, the range of detection is between 0.001 – 1 mg/m^3 with alarm set at 0.002 and 1.000 mg/m^3. Measurement will be done by holding the sensor to a breathing height of about 1.5 meters in the direction of the prevailing wind reading will be recorded when the monitor had warmed up (3minutes) to burn off contaminants on the sensor and air sucked into the sensor. Reading is displayed after 3 minutes.

Hydrogen sulphide (H_2S)

A BW Multi gas Monitor equipped with photochemical sensor will be used for the measurement of H_2S. The range of detection is between 0.1 – 60 ppm with alarm set at 1.0

and 20.0 ppm. Measurement will be done by holding the sensor to a breathing height of about 1.5 meters in the direction of the prevailing wind, readings will be recorded when the monitor had warmed up.

Methane (CH_4).

A BW Multi gas Monitor equipped with photochemical sensor will be used for the measurement of H_2S. The range of detection is between 1.0- 100 % with alarm set at 10 and 20 %. Measurement will be done by holding the sensor to a breathing height of about 1.5 meters in the direction of the prevailing wind, readings will be recorded when the monitor had warmed up sensors.

Ammonia (NH_3).

A BW Multi gas Monitor equipped with photochemical sensor will be used for the measurement of NH_3. The range of detection is between 1.0- 25 ppm with alarm set at 2 and 10 ppm. Measurement will be done by holding the sensor to a breathing height of about 1.5 meters in the direction of the prevailing wind, readings will be recorded when the monitor had warmed up sensors.

Volatile organic compounds (VOCs)

An Aeroqual Environmental Gas Monitor equipped with infrared sensor will be used for the measurement of VOCs. The Equipment operates on the principle of dual wavelength IR Absorption, the range of detection is between 0.1-1000 mg/m^3 with alarm set at 0.20 and 50.00 mg/m^3. Measurements will be done by holding the sensor to a breathing height

f about 1.5 meters in the direction of the prevailing wind readings will be recorded when the monitor had warmed up (3minutes) to burn off contaminants on the sensor and air sucked into the sensor.

Water Quality

Surface and Ground water:

Water handling and Analytical methods to be are presented on table 2.1 and 2.2 respectively.

Table 2.1: Details of sample handling

S/No	Parameter	Container type	Preservation technique
1.	Physico– Chemistry	Plastic (1.5 liters)	Iced Chest Cooler
2.	Oil and Grease	Wide mouth glass bottle	Acidified with H_2SO_4 / HCl
3.	Metals	Vials	Acidified with Nitric Acid
4.	Microbiology	Vials	Iced Chest Cooler

The analytical methods used for water parameters are summarized in table 2.2 below according to standard methods (APHA, 1995).

Table 2.2: Analytical methods to be used

S/No.	Parameter	Analytical Method
1.	pH	pH meter (ASTM 1293b – 95)
2.	Conductivity	Conductivity meter (APHA 2510B)
3.	TSS	Gravimetry (ASTMD 1888/78)
4.	TDS	Meter (ASTMD 1888/78)
5.	Chloride	Tritrimetry (Silver Nitrate ASTM D512)
6.	Alkalinity	Tritrimetry (Hce – APHA – 2320A)
7.	Sulphate	Tritimetry (ASTM D516 – 95)
8.	Phosphate	Tritrimetry (ASTM D515 – 95)
9.	Turbidity	Spectrophometry
10.	Nitrate	Tritrimetry (APHA 4500-N031B)
11.	COD	Tritrimetry (APHA 5220 B)
12.	BOD^5	Winkler (APHA 5210) method
13.	DO	Meter (ASTM D888 – 95) method
14.	ORP	Conductivity meter (APHA 2510B
15.	Metals	AAS (ASTM d357 – 95)

Soil study

Graduated soil auger shall be used to core soil samples from 0-15 cm top soil and 15 30cm bottom soil.

Sediment Chemistry

Eckman grab shall be used to trap sediment samples from upstream and downstream with the surface water around the facility.

3.1 Financial proposal for EAR of Elshcon Nigeria Limited

The cost breakdown for the EA study is given in table 3.1 below:

Table 3.1: Analysis cost

S/no.	Environmental components and parameters	No of samples	Rate / Sample Station	Total amount (N)
1.	air quality study: $PM_{7.0}$, PM_{10} (TSP), $PM_{1.0}$, & $PM_{2.5}$, Noxious gases: NO_2, CO, SO_2, H_2S, CH_4, VOCs & NH_3. CO_2	5	Lump/sum	150,000.00
2. (a)	Water quality: Surface and Bore Hole water: Dissolved Oxygen (DO), pH, Oil and Grease (O&G), Nitrates (NO_3^-), Sulphates (SO_4^{2-}), Chlorides (Cl^-), Phosphates (PO_4 and trace metals Lead (Pb), Copper (Cu), Iron (Fe) Manganese (Mn), Zinc (Zn) & Chromium (Cr) Colour, Temperature, Odour, Turbidity, Total Suspended Solids (TSS), Total Alkalinity, Total Hardness, Biological Oxygen Demand (BOD), Chemical Oxygen Demand (COD), etc.	2	45,000.00	90,000.00
(b)	Microbiology water	2	15,000.00	30,000.00

Table 3.1: Continue:

S/no.	Environmental components and parameters	No of samples	Rate / Sample Station	Total amount (N)
3.	Report writing & production		50,000.00	50,000.00
4.	Soil study	2	Lump/Sum	120,000.00
5.	Health and epidemiology	-	100,000.00	150,000.00
6.	Socio-economics	-	100,000.00	100,000.00
7.	Climate and meteorology	5	Lump/sum	40,000.00
8.	Noise study	5	Lump/sum	20,000.00
9.	RSMEnv Review Fees			50,000.00
	Grand Total			**800,000.00**

Amount in Word: Eight Hundred Thousand Naira Only

Thank you for giving us the opportunity to serve you.

Yours faithfully,
For' Prime Mover Consult Nig Ltd.

David Ishmael.
(Managing Director)
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