**NECTAR SIERRA LEONE BULK TERMINAL ENVIRONMENTAL ANNUAL ENVIRONMENTAL MONITORING REPORT 2023-2024**



**PREPARED BY:**

NJALA ENVIRONMENTAL TECHNICIAN SIERRA LEONE (NETSL)

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## **ABBREVIATIONS AND DEFINITIONS**

NSBT Nectar Sierra Leone Bulk Terminal

NETSL Njala Environmental Technicians Sierra Leone

NETSC Njala Environmental Technicians Consulting

EMR Environmental Monitoring Report

ESHIA Environmental Social and Health Impact Assessment

HSE Health, Safety and Environment

EPA-SL Environmental Impact Assessment – Sierra Leone

SAC Socfin Agricultural Company

ToRs Terms of References

WSM Workers Safety Management

IBP International Best Practices

SLPA Sierra Leone Port Authority

PPEs Personal Protective Equipment

FMEA Failure Mode and Effect Analysis

ERHRWP Environment Risk and Hazard Reduction at Work Place

## **DISCLAIMER**

The views expressed in this Report are based on the information supplied to Njala Environmental Technicians Consulting (NETSL) by Nectar Sierra Leone Bulk Terminal (NSBT). The opinions in this Report are provided in response to a specific request from Nectar Sierra Leone Bulk Terminal (NSBT) to do so. NETSL has exercised due diligence in reviewing all supplied information. Whilst NETSL has compared key supplied data with expected values, the accuracy of the results and conclusions from the review are entirely needful for the completeness of the report. NET does not accept responsibility for any errors or omissions in the supplied information and does not accept any consequential liability arising from commercial decisions or actions resulting from them. Views presented in this report apply to the site conditions and features as they existed at the time of NETSL’s investigations, and those reasonably foreseeable. These views do not necessarily apply to conditions and features that may arise after the date of this report, about which NETSL had no erstwhile knowledge nor had the opportunity to evaluate.

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Table 1: Version Control

|  |  |
| --- | --- |
| Project title | Biananual Environmental Monitoring Report for NSBT |
| Document title | Environmental Monitoring Report (EMR1) |
| Version | 2023NSBTEMR003-4 |
| Status | EIA license holder for (ESHIA) |
| Date of draft | 0/2024 |
| Requirement for tracking changes | Once a final version of the EMR has been approved by Health, Safety, and Environment (HSE) please make all further modifications to the EMR visible by either tracking changes or putting the modifications in a different colour to aid any subsequent review. |

Table 2: NSBT Company Profile

|  |  |  |  |
| --- | --- | --- | --- |
| **Company Information** | **Description** | | |
| **Company name** | Nectar Sierra Leone Bulk Terminal Company (NSBT) | | |
| **Business Certificates Tin No.** |  | | |
| **Affiliation** | Ministry of Marine, Ministry of Environment, Internal Affairs and Ministry of Trade | | |
| **Address** | 45 Cline Street, Cline Town, Freetown | | |
| **EIA CERTIFICATE No:** | EPA/SL/124 | | |
| **ISSUE DATE** | 12/08/2023 | **EXPIRY DATE** | 13/08/2024 |
| **PROJECT GEOGRAPHICAL COORDINATE** | N 829’38.61’’ W1312’36.97’’ | | N829’38.60 W1312’36.05’’ |
| **Contact Persons** | NSBT General Manager | | Siamba Kamara |
| Email | | siamba.kamara@nectar.co.uk |

## 

**Executive Summary**

NSBT is known in Sierra Leone for its cargo and bulk terminal operations. As a company that has an EIA license accredited by the EPASL since 2016 to date. The parent side of NSBT called NECTAR is well established in bulk terminal facilities across the World with consultancy services on cargo business. The company has connected views with GoSL in improving sea trade activities for commerce development in the country and other nations. NSBT management operates in homogenous systems with locals and foreign expatriates, and has high recruitment of labor force as Sierra Leonean citizens; a prerequisite to the Sierra Leone Local Content Policy. There is an amicable and convivial working relationship among all sectors within the project, and also shown strong relationship amongst the foreign and national staff. NSBT productivity plans and achievements have an enormous influence on income and profit generation for both the company and GoSL; either direct or indirect through tax maximization and employment of qualified local staff.

NSBT port expansion project is designed to increase its annual output capacity through increased berthing space; to that which management has been working on with much expectation to be commissioned in the few months ahead. The new establishment will contain equipment with NSBT proprietary for improving bulk, cargo processes, and other auxiliary services with support to other international investments like; Socfin Agricultural Company (SAC) being in the memorandum of understanding with NSBT on the berth expansion. However; NSBT has been in a good relationship with EPASL, as management continues to comply with its established “Terms of References (ToRs)” with all guidelines and principles followed accordingly and on time. The importance of this document is on the implementation of NSBT's obligation on its Environmental footprints and management benchmarks through which the capacity development plan forms a standing goal for the sustainable operation of NSBT in areas such as; Workers Safety Management (WSM), Environmental pollution and contamination monitoring and control, Aboriginal sustainability management and Company Relations with Community and neighboring contractors. With continual assessment on behalf of management, NSBT's performance on a larger scale; depends on its operational standards for the quality of the workplace with technical and engineering services as the main elements that meet the needs of its customers.

## **CHAPTER ONE**

## **1.0 INTRODUCTION**

NSBT has been a regular complier with the Environmental Protection Agency’s mandate; to undertake Environmental Management Assessment and monitoring for information sharing on its Environmental Management plan and CDAP every quarter. Also, implementation of previous recommendations on Environmental Management Plans and Community Development Action Plan (CDAP) activities.

However, NSBT recognition continues as it holds an EIA License for its sustainable operation at the Queen Elizabeth II Quay. Therefore, Environmental monitoring exercise is an important aspect of safety management Also, the company is currently investing in improving its operations on a modern scale; thus, Engineering mobilizations on works relating to principles that could better enhance the safety of its staff on International Best Practices (IBP) have been enforced, and with this, the company has embarked on very significant environmental modification like the energy conservation and climate change management on solar installation ahead of the new berth opening. The area inscribed in red shows the new berth expansion zone. This report highlights key areas for management efforts with expenditure for EMP implementations and CDAP application for the 2023 – 2024 year under review.

## **NSBT Facility Description**

Berths 1 and 2 leased from SLPA by NSBT have sustainably been managed by NSBT including all spaces that were actively acted on in guidance to its concessional surface plan engagement. It borders with other neighboring industries and fringes the Rokel River. In recent years, the existing terminal handling equipment for bulk services observed challenges which demand attention. Increasing cargo transports in Sierra Leone through coastal ports in the city is worth. the company progressing to its completion of the port expansion project, for which NSBT’s management is envisaging a positive and sustainable economic impact once the port expansion is completed with more transformation to their concession area on a modern scale.

Intriguingly, the expansion project is believed to be a force that can catalyst Sierra Leone annual output capacity in revenue collection from cargo and bulk terminal operations; including operational efficiency on terminal berths handling using modernized equipment for its proprietary bulk processes and other auxiliary facilities and expatriate support to other international investment such as Socfin Agricultural Company (SAC) and Rutile Company. NSBT work team are in full support to functionally sustained the process for Palm Kernel Oil exports in Sierra Leone trade with compliance to *Port and cargo laws of Sierra Leone* such as the Sierra Leone Maritime Administration Act, 2000 [No. 11 of 2000]and Merchant Shipping Act, 2003 [No.3 of 2003].

## **1.1.1 Status of the NSBT Port Expansion Project**

NSBT being owners of the berth expansion and holders of the EIA license, has the responsibility to fulfill its Environmental Management Plan (EMP) and should work in line with the contractor - EIFFAGE Gene Civil Marine Company’s engineering processes on the construction of the port at Queen Elizabeth II Quay in Western Urban Freetown. About the existing objectives that were set at the inception stages of planning and designing of the work process by the expansion project screening and scoping studies, both external and internal criteria were identified as obligations to fulfill by **EIFFAGE** management throughout the construction phase, this amongst others requires the submission of Environmental Monitoring Report on work interaction with sensitive environmental media such as (Air, water and soil/land) with the inclusion of occupational incidences and redresses, general work safety management and socio-economic benefits.

In compliance with EPASL requirement for environmental prudence, EIFFAGE prepared and submitted a closure report to the agency and NSBT upon the completion of the first phase of their work. The details of the report accounted for the status of the environment (air, water and land) before, during and after their operations. By law, they are expected perform a post construction environmental monitoring for a period of time, which will be continued by NSBT. The expansion work mobilization for the project is split into activities and the status of the activities are as follow:

1. Main quay walls, East & West Return combi-walls – 100% complete
2. West Return Anchor wall - 100% complete
3. East Return wall - 100% complete
4. Main Anchor Walls tie rods & waling beams 100% complete

|  |  |
| --- | --- |
| *Ariel view of the Berth construction site* | *C:\Users\Tiah\Downloads\expansion 4.jpgPresent Status of the Berth construction Project* |

Figure 1: Status of Berth expansion project

## **1.2 Display of Certification**

NSBT always displays its certificates as a guarantee of its operations within the premises of the SLPA company. The display of copies of compliance and protocols is a key requirement for EPASL management. Table 1 below showcases a number of certificates that have been obtained and renewed over the years by the company and their references numbers.

Table 3: Display of some certificates acquired by NSBT

|  |  |  |
| --- | --- | --- |
| Certificates Obtained | Certificate No. | Purpose |
| EPA-SL License Certificate | EPA-SL I24/2023 | EPA-SL Certified |
| Sierra Leone Standards Bureau | SLSB/LM/008/2023 | Standard Metrology |
| Certificate of fitness Ministry of health | REF.NO.OHS/IH017/24 | Business company |

## **CHAPTER TWO**

## **2.0 REFERENCED NATIONAL AND INTERNATIONAL BEST PRACTICES FOR NSBT**

Referenced national and international acts and policies play a crucial role in shaping the legal and regulatory landscape for various sectors. At the national level, The ***Environmental Protection Agency (EPA) Act in 2010 (Amended 2022)*** often ensure acts and policies that address issues such as environmental protection and other key national issues. These measures provide a framework for governance, establish rights and responsibilities, and protect company’s interests. On the international stage, treaties and agreements between nations tackle global challenges, including climate change, biodiversity conservation and sustainable management of living natural resources. These acts and policies serve as guidelines for harmonizing standards and cooperation for NSBT, fostering a more interconnected and responsible global community. By adhering to and continuously updating these referenced acts and policies, nations can work together towards a more sustainable and secure environment for all.

## **2.1 Referenced National Legal and Institutional Framework for NSBT**

This annual environmental monitoring report has been carried out in accordance with the Environmental Protection Agency Act (EPA Act, 2022). It summarizes the key environmental, social and health legislation framework, their relevance to the project and the key institutional framework required to enforce it. It considers all relevant acts, regulations, policies, and strategies including the following:

* EPA Act in 2010 (Amended 2022):
* Factory Act-1974:
* The Sierra Leone Local Content Agency Act, 2016 [No. 3 of 2016]:
* The Anti-Corruption Act 2000, as amended in 2008
* Wages and Industrial Relations Act 1971 and the Employers and Employed Act 1960
* The Goods and Services Act 2009 (as amended)
* The Sierra Leone Small and Medium Enterprises Development Agency Act, 2016 [No. 2 of 2016]
* The Companies Act, 2014 [No. 9 of 2014]
* The Business Registration Act 2007
* The Customs Act, 2011 [No. 9 of 2011]
* The Sierra Leone Electricity and Water Regulatory Commission Act, 2011 [No. 13 of 2011]
* The Human Rights Commission of Sierra Leone Act, 2004 [No. 9 of 2004]
* The Investment Promotion Act, 2004 [No. 10 of 2004] Repeals the Non-Citizens (Trade and Business) Act, 1969.
* The Child Right Act, 2007.
* Environment Protection Agency Act (2022)
* The Factories Act (1974)
* Local Content Agency Act (2016)
* The Sierra Leone National Environmental Policy (1990) revised in 1994
* The National Land Policy of Sierra Leone (2015)
* National Health Policy (2002)
* The Integrated National Waste Management Strategy (2012)
* The Sierra Leone National Plastics and Plastic Waste Management Policy of 2023

## **2.2 Referenced International Best Practices for NSBT**

NSBT project would have to be influenced by several policies, laws, and regulations on specific areas of environmental management and rehabilitation. Principally, there is a National Environmental Policy of 1994 and the Environmental Protection Agency Sierra Leone (EPASL) Act of 2010 and 2022 as reviewed, requiring projects that would have a direct or indirect significant impact on the environment.

Table 4: Referenced International Best Practices for NSBT

|  |  |  |  |
| --- | --- | --- | --- |
| **World Bank Environmental and Social Standards** | | | |
| **No** | **World Bank Environmental & Social Standards (ESS)** | **Reference and Guidelines** | **NSBT Obligation with Reference** |
| ESS 1 | Assessment and Management of Environmental and Social Risks and Impacts | Sets out the Borrower’s responsibilities for assessing, managing, and monitoring environmental and social risks and impacts associated with each stage of a project supported by the Bank through Investment Project Financing (IPF), to achieve environmental and social outcomes consistent with the Environmental and Social Standards (ESSs) | NSBT through its consulting firm, NET assesses and monitors the environmental and social impacts of its operation on the environment. |
| ESS 2 | Resource Efficiency and Pollution Prevention and Management | Recognizes that economic activity and urbanization often generate pollution to air, water, and land, and consume finite resources that may threaten people, ecosystem services, and the environment at the local, regional, and global levels. This ESS sets out the requirements to address resource efficiency and pollution prevention and management throughout the project life-cycle. | Management should understand that natural resources like sand, stones etc., are used efficiently and also ensure that pollution rate is kept minimal. |
| ESS 3 | Biodiversity Conservation and Sustainable Management of Living Natural Resources | Recognizes that protecting and conserving biodiversity and sustainably managing living natural resources are fundamental to sustainable development and it recognizes the importance of maintaining core ecological functions of habitats, including forests, and the biodiversity they support.  ESS3 also addresses sustainable management of primary production and harvesting of living natural resources, and recognizes the need to consider the livelihood of project-affected parties, including Indigenous Peoples, who’s access to, or use of, biodiversity or living natural resources may be affected by a project. | NSBT shall ensure that both on-shore and off shore operations do not affect the livelihood of people who benefit from access to the area, hence protecting the biodiversity of the site. |
| ESS 4 | Cultural Heritage | Recognizes that cultural heritage provides continuity in tangible and intangible forms between the past, present, and future. ESS8 sets out measures designed to protect cultural heritage throughout the project life-cycle. | NSBT shall ensure its operations do not alter but rather promote the cultural legacy of the mining area. |

## **CHAPTER THREE**

## **3.0 SCOPE OF NSBT ANNUAL ENVIRONMENTAL MONITORING REPORT**

The report considers mandatory implementation in accordance with the EPASL Act 2022. This obliges NSBT to strictly share information on its EMP and CDAP actions within selected time frame as agreed within the ToRs. Implementation of first biannual and/or annual are all under the stern guidance of EPASL; being the evaluator for accreditation for EIA License certification. The report contents satisfy both internal and external importance on areas such as: Environmental Quality Management Systems on Berth Expansion, general workers’ health and environmental safety, and Community Development Actions. In particular, this scope of this annual report decisively focuses on the following milestones:

**Objective 1:** Monitoring of Chemicals in use and storage, Water Usage, Occupational Health and Safety, and Waste Management.

**Objective 2:** Failure Mode and Effect Analysis (FMEA) for NSBT

**Objective 3 :** Air Quality and Noise Management

## **3.1 Objective 1: Monitoring of Chemicals in use and storage, Water Usage, Occupational Health and Safety, and Waste Management**

Essentially, NSBT’s commitment strides to meet its fulfillment on services for effective safety management and quality workplace. Therefore, the consulting team has been in reference with few international standards such as; ISO9001 and ISO 18024 (OHS) to obtain highest compliance rating that could be of great significant to both company and the country infrastructure since it addresses property damage, general environment and life protecting mechanisms for better work premise. The company’s Chemical and water usage, energy usage, sanitation and hygiene, waste management, Failure Mode & Effect Analysis (FMEA) and atmospheric footprint were assessed to achieve that.

## **3.1.1 Water Usage**

The company's water demand is basically for two main purposes: domestic and drinking either purpose, it is important to look at the sources, quantity used, and quality, especially for the drinking water.

Table 5: Monthly Domestic Water Usage (Annual)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **LOCATION** | **Feb** | **March** | **April** | **May** | **June** | **July** | **TOTAL** |
| Quantity in Liters | Quantity in Liters | Quantity in Liters | Quantity in Liters | Quantity in Liters | Quantity in Liters |
| Step 1 water tank | 6000 | 6000 | 9000 | 6000 | 3000 | 3000 | 33,000 |
| Step 2 water tank | 6000 | 6000 | 6000 | 6000 | 3000 | 3000 | 30,000 |
| Buffer zone water tank | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Savage Square water tank | 9000 | 9000 | 9000 | 9000 | 3000 | 3000 | 42,000 |
| Technical coordinator's water tank | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SLPMC admin water tank | 20000 | 20000 | 20000 | 20000 | 10000 | 0 | 90,000 |

All facilities using water through the NSBT management and support system within the operational area at the SLPA environment; revealed that; a total of 195,000 liters was used from February to July 2024. With critical assessment, however, according to the information in Table 6; moderate water consumption was noticed during July; due to rainfall and fewer users due to weather. With the highest figure in usage considered to be within the SLPMC facility, with a sub-total of 90.000Litres more than all other areas in service. The monitoring efficiency by NSBT should be robust; and key observations should be on: leakage and no control or security. An alternative supply system should be implemented such as; improve rain harvesting and responsible usage.

## **3.1.2 Energy Usage**

Energy being used by the company is viewed in two broad areas: Electrification and Transportation. For electrification, the company uses the electricity provided by the national electricity grid (EDSA) and a Diesel generator, with an installed capacity of 120 kW solar PV array as a backup. The company uses heavy-duty vehicles that are fueled with diesel. Therefore, the quantity of fuel used for electrification and transportation for the reporting period is combined and presented in the tables below:

**3.1.2.1 NSBT Alternative Energy Systems**

**NSBT alternative energy adoption for climate change impact**

NSBT in its operation considered the modification to change from fossil fuel use to green energy; this adoption became reality as NSBT pushed on its expansion project at the port; with much recognition to the project linked to environmental resources and compliance with Environmental Protection Agency Sierra Leone (EPA-SL), and Global Climate Change Management request for all industries in a way to reduce greenhouse gas emissions as it is critical to human life and general environment, NSBT has installed huge solar panels and worth to produce an equivalents kilo-voltage of 100 to 120 kW. These have cost huge expenditure on the NSBT budget, as can be seen on.

Table 6. Alternative Energy Supply

|  |  |  |
| --- | --- | --- |
| **System Details** | | |
| **Item** | **Details** | **Environmental Expert Comment** |
| Solar System | 120 kWp | Generating power from the sun shining on the roofs of NSBT roof-mounted system increases energy security, reduces vulnerability to blackouts, and avoids costly transmission line investments. |
| Energy Storage System | 85 kWp |
| System Design | Solar PV and Battery Systems |
| Est. Annual Output | 155,878 kWp/y |

Table 7: Alternative Energy Supply

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Design** | **PV Capacity (kWp)** | **ESS Capacity (kWp)** | **Est. Annual Yield (kWp)** | **Engineering Expert Comments** |
| Roof mounted system | 120 | 85 | 155,878 | Structural analysis will inform exact placement of panels |

## **3.2 Objective 2. Failure Mode and Effect Analysis (FMEA) and Energy Control System for NSBT**

**Principle**

FMEA for NSBT serves as a systematic and proactive risk assessment tool used to identify potential failures for an electrical appliance, or system, and to analyze the potential effects on overall performance. By conveying these factors, NSBT can prioritize and address high-risk areas with appropriate mitigation strategies and the actual required wattage expected to utilize in each location established by NSBT. FMEA helps to enhance product or process reliability, efficiency, reduce costs and improve safety by identifying and addressing appliance or device possible failures and effects.

## **The FMEA principles for NSBT systems and management**

1. The purpose of the FMEA is to take actions to eliminate or reduce failures, starting with the highest-priority ones.
2. Failure modes and effects analysis also documents current knowledge and actions about the risks of failures, for use in continuous improvement. FMEA is used during design to prevent failures.
3. Reduces the risk of a problem happening more than once; provides prompts for employees to follow when facing a potential failure mode; promotes more collaboration among teams that handle areas such as design, manufacturing, quality, testing, sales, and purchase.

FMEA Checklist on Appliances and Control for NSBT Facilities and Management

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Electrical Description** | | | | **Description of failure** | | | **Impact of failure** | | |
| **Electrical Unit** | **Energy** | **Maximum**  **Energy(Watts)** | | **Failure Mode Identification** | | | **Impact on Environment** | | **Impact on Human** |
| **ADMINISTRATIVE BUILDING – SECOND FLOOR** | | | | | | | | | |
| Socket | N/A | N/A |  | | Ammeter test | | | When defected causes electrical flow shortage and possible fire ignition | This can lead to electrocution, possible mortality, and property loss |
| Extension | N/A | N/A |  | |
| Florescent Bulb | 14 watts | 504 |  | | Defective lightning | | | Possible explosion, daylight factor effects | Visionary disturbance in human |
| Air Conditioner | 900 Watts | 9000 |  | | Emission of high temperature, a drop of liquid water from the unit | | | Unusual sound, leakages of water inside the indoor unit, and reverse cooling effects | Exposure to leaking gas and poor handling can cause cancer in humans. |
| Computers laptop | 720 watts | 7,920 |  | | Regular inspection by an IT expert | | | Increase in radiation level | Long exposure can lead to cancer in human |
| Monitor | 1600 watts | 12,800 |  | |
| Printers | 340 watts | 340 |  | | Observe error codes regularly and assess voltage rating | | | Increase in radiation level | Long exposure can lead to cancer in human |
| Freezers | 571 watts | 3,555 |  | | Poor earthen, less gas, and low voltage supply | | | Thermal effect via operation causes radiation and possible leakage on the evaporator causes | Cold exposure may affect various organs in the human body such as the respiratory system, skin disorders, etc, |
| Inverter | 5,500 watts | 11,000 |  | | When an Inverter does not turn on | | | Short-circuiting is the biggest impact of an inverter on the enenvironment | lead-acid battery can severely irritate the human respiratory tract and acid can cause third-degree burns. |
| Fan | 50 watts | 50 |  | | Vibrating but no oscillation | | | the user notices a spark, failure to do so might result in fire, bodily injury, or electrical shock | Fans can lead to health problems. |
| Plasma TV | 57 watts | 57 |  | | Distorted colors on part of the screen | | | Continues use of Plasma television can cause radiation exposure to human and increasing climate change temperature | The human health and ecotoxicity potentials are evaluated by combining data on the heavy metal contents |
| Water heater | 3000 watts | 3000 |  | | Non heating of water and smell of burnt cables | | | The water heater utilization gives off harmful emissions every time it runs, which has negative impacts on the environment | The harmful emission of water heaters has a direct relationship with the air which in return can harm human beings |
| Microwave | 1,700 watts | 1,700 |  | | Heating food slower than usual | | | Microwaves release short wavelength and that can cause indoor pollution in office environment | Emission of radiation has a tendency to pollute the indoor environment causing radio nuclear exposure to human existence |
| **Total** | | **38,606 watts** | | | | | | | |
| **ADMINISTRATIVE BUILDING –FIRST FLOOR** | | | | | | | | | |
| Socket | N/A | N/A | Ammeter test | | | | This can lead to electrocution, possible mortality, and property loss | | This can lead to electrocution, possible mortality, and property loss |
| Extension | N/A | N/A | Counterfeit starter | | | | A broken fluorescent bulb has a contaminant gas that can easily pollute the environment | |
| Florescent Bulb | N/A | N/A | Counterfeit starter | | | | A broken fluorescent bulb has a contaminant gas that can easily pollute the environment | | Visionary disturbance in human |
| Air condition | 1,397 watts | 6,985 | Unusual sound, leakages of water inside the indoor unit, and reverse cooling effects | | | | Warm air blowing out causing heat in a closed environment and release of solvent gas can cause climate change | | The use of AC can lead to an increase in radiation that is harmful |
| Computers Laptops | 920watts | 5,520 | Regular Boot Errors | | | | Increase in radiation level | | Long exposure can lead to cancer in human |
| Printers | 60 watts | 60 | Printer not responding | | |  | The organic compounds in printer ink can lead to soil and even water pollution when left in landfills | | printers emitted tiny bits of toner in the form of ultrafine particles which penetrate into the lungs and lead to a cardiovascular problem |
| Freezers | 140 watts | 420 | Overvoltage and or improper connection | | | | When it cannot hold its temperature as well as it should | | Refrigerants, such as chlorofluorocarbons (CFCs) are extremely dangerous to the environment when left in landfills |
| Fan | 50 watts | 50 | Vibrating but no oscillation | | | | Fans must be powered off when the user notices a spark, failure to do so might result in fire, bodily injury, or electrical shock | | The continual use of electric fans can lead to abnormal body temperature |
| Water heater | 3000 watts | 3000 | Water never gets hot enough | | | | The water heater utilization gives off harmful emissions every time it runs, which has negative impacts on the environment | | The harmful emission of water heaters can increase radiation that causes radio-nuclear doses to man |
| Water Dispenser | 240 watts | 480 | The water dispenser fails to run because of: Frozen or clogged fill tubes or water lines. | | | | Can substantially reduce plastic waste but can cause an increase in indoor temperature. | | Using water dispensers without monitoring of tubes and water chambers can cause bacterial boom and cause disease spread to human |
| Monitors | 3,200 watt | 16000 | Inaccurate colors | | | | LCD screens have chemicals that posed adverse effects on the environment such as air and water pollution when left in landfills | | Ionizing chemicals contained in LCD screens are dangerous for human health |
| Plasma monitor | 137 watts | 274 | Distorted colors as part of the screen | | | | Plasma monitor has heavy metals that are very harmful to the environment when left in landfills | | The human health and ecotoxicity potentials are evaluated by combining data on the heavy metal contents |
| Microwave | 1200 watts | 1200 | Physical observation | | | | Microwaves release radio-nuclear waves into the environment every year | | Emission tends to pollute the air which has a direct impact on human existence |
| Inverter | 3000 watts | 3000 | When an Inverter does not turn on | | | | Short-circuiting is the biggest impact of an inverter on the environment | | A lead-acid battery can be severely hazardous to the human respiratory tract and acid can cause third-degree burns. |
| Server | 2,200 watts | 6,600 | Constant reboots and sudden slowness indicate a faulty server | | | | Data centers contribute 2% of the total global greenhouse gas emissions. Electronic waste, otherwise known as E-Waste, is another byproduct of data center refresh activity | | Prolonged noise exposure may lead to many adverse health impacts causing sickness in humans. |
| Network Keyboard | 200 watts | 200 | Irresponsive | | | | Keyboards require plastic (made from fossil fuels) to make - and end up as e-waste at the end of their life because they don't biodegrade | | The use of keyboards can lead to ergonomic impacts on lumber vertebra column |
| **Total** | | **43,789 watts** | | | | | | | |
| **ADMINISTRATIVE BUILDING – GROUND FLOOR** | | | | | | | | | |
| Florescent Bulb | 14 watts | 14 | Counterfeit starter | | | | A broken fluorescent bulb has a contaminant gas that can easily pollute the environment | | According to studies, florescent light can inflict dizziness on human |
| Socket | N/A | N/A | Physical examination | | | | Can cause fire outbreak | | This can lead to the loss of lives and properties |
| Standing Fan | 50 watts | 50 | Vibrating but no oscillation | | | | Fans must be powered off when the user notices a spark, failure to do so might result in fire, bodily injury, or electrical shock | | The continual use of electric fans can lead to health problems. |
| Freezer | 171 watts | 171 | When it cannot hold its temperature as well as it should | | | | Refrigerants, such as chlorofluorocarbons (CFCs) are extremely dangerous to the environment when left in landfills | | Causing an increase in radiation that can impact human |
| Total | | **235 watts** | | | | | | | |
| **TECHNICAL** | | | | | | | | | |
| Socket | NA | N/A | Physical examination | | | | Can cause fire outbreak | | This can lead to the loss of lives and properties |
| Air conditioner | 900 Watts | 4500 | Warm air blowing out | | | | The use of AC can lead to an increase in CO2 emissions that are harmful to the environment. | | Air conditioning at work and at home can lead to problems, such as colds, fevers, headaches, and fatigue. |
| Computers Laptop | 1440 watts | 17,280 | Regular Boot Errors | | | | Computers contain heavy metals and toxic chemicals that pollute the soil and contaminate groundwater when they are dumped into landfills | | A computer can decline in cognitive abilities and damaged vision |
| Computer Monitor | 1600 watts | 3200 | Inaccurate colors | | | | LCD screens have chemicals that can posed adverse effects on the environment such as air and water pollution when left in landfills | | The chemicals radiation caused by LCD screens are dangerous for human health |
| Printers | 50 watts | 50 | Printer is unresponsive | | | | The chemicals in printer ink can be extremely harmful to the environment and toxic to soil environment | | The toner used in laser printers contains hazardous compounds such as toxic powder that can cause cancer on human |
| Florescent Bulb | 14 watts | 994 | Fluorescent tube lights at one end only. | | | | A broken fluorescent bulb has a contaminant gas that can easily pollute the environment | | When defected can cause discomfort on human leading |
| Security Fog Light | 240Watts | 2,400 | Detected dim, flickering, or not turning on at all, and a blown fog light fuse | | | | A fog light can influence the radiation balance in the atmosphere | | Visionary impact. arises when persistently exposed to beams from fog light |
| Water Dispenser | 120 watts | 120 | The water dispenser fails to run because of: Frozen or clogged fill tubes or water lines. | | | | By using water dispensers, you can substantially reduce plastic waste,  And as well can released radiation | | If cleaning of tubes and dispenser container lacks, there will be tendency for the dispenser to develop pathogens that my cause water borne disease. |
| **Total** | | **28,544 watts** | | | | | | | |
| **WEIGH BRIDGE** | | | | | | | | | |
| Water Dispenser | 120 watts | 120 | The water dispenser fails to run because of: Frozen or clogged fill tubes or water lines. | | | | By using water dispensers, you can substantially reduce plastic waste, decrease carbon emissions, and release radiation | | The risk of cross-contamination can cause waterborne diseases such as cholera and another contagious disease like hepatitis tuberculosis etc. |
| Printer | 340 watts | 340 | Printer is unresponsive | | | | The volatile organic compounds (VOCs) and heavy metals in printer ink can lead to soil and even water pollution when left in landfills | | printers emit tiny bits of toner in the form of ultrafine particles which penetrate into the lungs and lead to a cardiovascular problem |
| Fluorescent Bulb | 14 watts | 84 | Fluorescent tube lights at one end only. | | | | A broken fluorescent bulb has a contaminant gas that can easily pollute the environment | | According to studies, florescent light can inflict dizziness on human |
| Weigh Bridge scale | 10 watts | 10 | Errors typically arise and are detected by an electronic monitor | | | | Occupies useful space on land that increases the load | | Crane might collapse and hit the digital room or human causing mortality |
| **Total** | | **554 watts** | | | | | | | |
| **Update/Modification:** Throughout reporting, no new electrical appliance was added. However; damaged appliances like bulbs, AC, Computers, and others., were serviced; while some were replaced with the same brands and specifications. This inventory will be reviewed continuously for the subsequent Environmental Monitoring Reporting period. | | | | | | | | | |

Table 6: Statistical Analysis of FMEA

|  |  |  |
| --- | --- | --- |
| **NSBT establishment area** | **Expected wattage requirement per maximum rating(watts)** | **% Rating** |
| Administrative Building Second Floor | 38606 | 34.55 |
| Administrative Building First Floor | 43789 | 39.19 |
| Administrative Building – Ground Floor | 235 | 0.21 |
| Technical | 28544 | 25.54 |
| Weigh Bridge | 554 | 0.49 |
| Total | **111,728** | **100** |

**Discussion**: It is shown that, in all established areas of operation in NSBT, there is more energy utilization for the administrative building first floor at (39.19%), followed by the administrative building – second floor at (34.55%) and with a technical area of (25.54% ), but showing a favorable value for admin building and weigh bridge with (0.21% and 0.49%) respectively.

**RECOMMENDATION:** In an effort to reduce the likelihood of failure of the electrical appliances which may affect the steady operations of the company, NETSL conducted the FMEA and as such has proffered the following recommendations:

1. This document should be made available the electrical servicing team of the company.
2. Management should ensure that top quality appliance(s) is procured.
3. The electrical servicing team should adopt periodic preventive maintenance for all electrical components of the company.

**3.3 Fossil Fuel used in NSBT operations by power generation and transport**

Table 7. NSBT Power generation and automobiles using Diesel



**Comment:**

Diesel as a fossil fuel product contains a higher carbon chain that makes it burn with a high calorific value due to enthalpy of combustion, therefore; shown in Table 7, many fossils were used in the year, 2023 with a value of 49179 Litres when compared with 2024, with 39288 Litres; justifiers that NSBT operations were less in services that use diesel. The increase was also attributed to power generation and vehicle operation.

## **Using, Storing and Transporting of Chemicals**

* + 1. **NSBT Safe Handling and Usage of Chemicals**

The idea on chemical safety management system; describes as a systematic approach to safety requires an efficient flow of information from the suppliers to the users of chemicals on potential hazards and correct safety precautions. This concept related to that of (ILO1993) Code of Practices on Safety. In essences, the supplier should provide an employer with essential information about hazardous chemicals in the form of a chemical safety data sheet. This Material Safety Data Sheet(MSDS) describers the hazards of a material and provides instructions on how the material can be safely handled, used and stored.

**3.4.2 Matrix on chemical properties assessment and risk, hazard clarification**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Physical & Chemical | Stability & Reactivity | Toxicological information | Ecological Information | Disposal Considerations | Transport Information | Regulatory Information | Company information and management o handling |
| **Liquid Chemicals:** | | | | | | | | |
| 1. Engine oil | lab | In-situ | lab | In-situ | EPA | NSBT | EPA | Contained with safe keeping |
| 1. Lubricant oil | lab | lab | lab | In-situ | EPA | NSBT | EPA | Contained with risk of spills |
| 1. Transmission oil | lab | lab | lab | In-situ | EPA | NSBT | EPA | Contained with safe keeping |
| 1. Hydraulic oil | lab | lab | lab | In-situ | EPA | NSBT | EPA | Contained with lesser risk |
| 1. Engine cleaner/degreaser | lab | In-situ | lab | In-situ | EPA | NSBT | EPA | Contained with insignificant risk |
| 1. Oil spill removal | lab | EPA | lab | In-situ | EPA | NSBT | EPA | Contained appropriately |
| 1. Brake fluid | lab | In-situ | lab | In-situ | EPA | NSBT | EPA | Contained with very low risk |
| 1. Coolant/Anti freezer | lab | In-situ | lab | In-situ | EPA | NSBT | EPA | Contained with lower risk |
| 1. Refrigerant | lab | lab | lab | In-situ | EPA | NSBT | EPA | Still having challenge with servicing history check |

## **3.5 Occupational Health and Safety Management for NSBT**

Occupational Health and Safety Management is a comprehensive and proactive approach dedicated to ensuring the well-being of all employees and to reduce insurance liabilities on the employers. With a firm commitment to safeguarding of workforce and workplace from potential hazards and risks, NSBT's implementation of robust policies and procedures complies with industrial standards and regulations, through regular risk assessments, training programs, and continuous monitoring. NSBT considers all-inclusive protection of its personnel from accidents, emergencies, and disasters, the impact can be related to the sustenance of NSBT's overall productivity and organizational successes; this can be measured using the regular toolbox talk (TBT).

Table 8: Training on Toolbox Talk for NSBT

|  |  |  |
| --- | --- | --- |
| **SAFETY TOOLBOX SHEET** | | |
| **DATE** | **PRESENTER** | **TOPIC** |
| 02/02/2024 | Yusuf Sesay | Safety signs/Symbols |
| 09/02/2024 | Lamina Kargbo | Safety precaution |
| 16/02/2024 | Patrick Roberts | Eating habit (Overeating) |
| 23/02/2024 | Amidu Karim Kamara | Working at height |
| 01/03/2024 | Esther Ngaujah-Kabia | International Women's day |
| 08/03/2024 | No ToolBox | Public holiday |
| 15/03/2024 | Kalie Saccoh | Glucoma |
| 22/03/2024 | No ToolBox | Due to Heavy Operation |
| 29/03/2024 | No Toolbox | Easter Holiday |
| 05/04/2024 | Lamina M Kargbo | World Health Day |
| 12/04/2024 | Patrick Roberts | Drugs abuse and its Effect |
| 19/04/2024 | Amidu Karim Kamara | What is First Aid |
| 26/04/2024 | Mr. Lamina Kargbo Yusuf Sesay Technical Department | World Safety Day The Use of Solar Panel |
| 03/05/2024 | Yusuf Sesay | Organisational Culture |
| 10/05/2024 | Amidu Karim Kamara | I could have save a life |
| 17/05/2024 | Benjamin Wurie | Coast Guard Visit |
| 24/05/2024 | Dr. Kamara | Terms and condition of his service |
| 31/05/2024 | Amidu Karim Kamara | Lifting and Rigging |
| 07/06/2024 | Yusuf Sesay | Understanding Safety Culture |
| 14/06/2024 | Patrick Roberts | Pressure to get work done |
| 21/06/2024 | Patrick Roberts | Accident prevention |
| 28/06/2024 | No ToolBox | Due to Heavy Operation |
| 29/06/2024 | Lamina Kargbo | Fire Safety |
| 30/06/2024 | Amidu Karim Kamara | Accident and Incident Reporting |

**3.5.1 Personal Protective Equipment (PPEs) types, model and application in use**

NSBT prioritizes the importance on the safety and well-being of its workforce, and the use of Personal Protective Equipment (PPE) as critical component in its daily operations. All workers and visitors within the company’s concession are required to fully use the appropriate PPE, in order to mitigate potential hazards. The specific PPE’s requirements are determined based on the nature of the tasks and potential risks involved. PPE’s like: hard hats, safety goggles, high-visibility vests, steel-toed boots, and sometimes hearing plugs are supplied regularly and strict safety leadership is being demonstrated to ensure the regular proper usage of various PPEs.

By enforcing the use of PPE’s, the project underscores its commitment to preventing accidents, incident rates at work place.

**Recommendation:** OS&H principles in any workplace plays a significant role in the mitigation of accident and emergencies from company operational instruments, work zone, fighting, biosecurity threats, physical, chemical, biological hazards; the following recommendation made and needed for NSBT to promptly implement.

1. Records of PPE’s products, model, date of supply and total amounts distributed should be key in documentation
2. Environmental Monitoring templates should be developed for all aspects of training, work safety applications, and rescues, this is very important and requires the management of NSBT to collaborate with experts for immediate actions.

## **3.5.2 Waste Management**

The management of NSBT emphasizes waste management efficiently in practice that will minimize its impact on the environment and its workers; through clean and sustainable working environmental practices. Segregation of waste at source is practiced. Bins are designated for different types of waste, including recyclables, non-recyclables, hazardous waste, and organic waste. Regular waste audits are conducted to assess waste generation patterns and identify areas for improvement. The company waste is managed by; Shitanga Logistics Company.

Shitanga has been an NSBT waste management contractor in previous years, but as management changed its service request with MASADA; an experience of very efficiency in collection has been prominent. Therefore; since the management of NSBT has to fulfill its mandate a decision taken to work with “Shitanga and much improvement has been shown. Evidence to the effect is provided in the appendices.

|  |  |
| --- | --- |
| C:\Users\vayasu\Desktop\EMP- semetsrial report\ENVIRONMENT - AUDIT\9.WM - Waste Management\WM. 1\Oil filters.jpg**OIL FILTERS** | C:\Users\vayasu\Desktop\EMP- semetsrial report\ENVIRONMENT - AUDIT\9.WM - Waste Management\WM. 1\Organic waste.jpg**ORGANIC WASTE** |
| C:\Users\vayasu\Desktop\EMP- semetsrial report\ENVIRONMENT - AUDIT\9.WM - Waste Management\WM. 1\Plastic waste.jpg**PLASTIC WASTE** | C:\Users\vayasu\Desktop\EMP- semetsrial report\ENVIRONMENT - AUDIT\9.WM - Waste Management\WM. 1\Soiled rags, absorbant,... .jpg **SOILED ABSORBENT** |

Figure 2: Designated bins for different types of waste

**Recommendation:** NET identifies important waste management steps requires for NSBT to implement in the shortest possible time; these actions would help management achieve part of an ISO9001 certification requirement, these include:

1. The bins should indicate NSBT logo or name broadly and restricted from public
2. Quantification of total waste by type and location generated is key to effective monitoring.

## **3.6 Objective 3: Air Quality and Noise Management**

**3.6.1 Air Quality Assessment**

**Requirements**

As imperative by Environmental standard requirement for project interfacing in the environment, to assess quality of its atmosphere (Air), whilst carrying out its main objectives, as implies to NSBT project at the SLPA community. Basic atmospheric data were collected throughout the monitoring phases around NSBT concessional area and berth expansion terrain to ensure that adequate information were in place for comparative analysis. All atmospheric data were collected in-situ with specified equipment. Wind speed, relative humidity, temperature and noise were determined. NSBT physical atmospheric environment defines with the atmosphere it exists in with relevance on: humidity stratification, temperatures and noise levels within and outside the company location.

**Equipment**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| |  |  |  | | --- | --- | --- | | Model: HT-80A | Model: LKC 1000E/1000S+ | ETEKCITY Infrared thermometer 774 | | C:\Users\MR DUMBUYA\Downloads\IMG_1719.JPG | C:\Users\MR DUMBUYA\Downloads\IMG_1717 (1).JPG | C:\Users\MR DUMBUYA\Downloads\IMG_1720.JPG | |

Figure 3: Equipment for Air Monitoring

**3.6.2 Sound Level-Equipment**

Equipment name: – (Model: HT-80A): The Sound Level Meter (SLM) is a sound measuring device designed to meet the measurement requirements of safety Engineers, Health, Industrial safety offices and sound quality control in various environments. It functions with measuring the following g environmental conditions:

Altitude up to 2000 m

Relative Humidity (90 %) max.

Operation ambient 0 ̴ 40 ᵒC

**Air Quality:**

(AQI, RH%, PM and Formaldehyde) measuring equipment:

Equipment name: - Equipment name:( Temtop- LKC – Model 1000E/1000S+): Measuring AQI, RH, Temp and PM (2.5 & 10µg). The LKC- 1000 Series are designed to detect Air Quality.

Method

The measuring range of the sound level meter operates in decibel (dB), each time a datum is taken in the appropriate or required environment can be resolute within the range of 30dB ̴ 130dB at 1.0dB under accurate conditions. And all precautions were adhered to during the entire session of monitoring. Whilst a multifunctional air quality monitor with high precise electrochemical formaldehyde sensor, laser particle sensor transformed invisible pollutant concentration into visual data for knowing the quality atmosphere within NSBT operational area at the Queen Elizabeth II Quay.

Table 9: Sampling Points

|  |  |  |
| --- | --- | --- |
| **Sampling Points** | | |
| SLPA Admin. Building | Cofferdam North | Main Weigh Bridge |
| Weigh Bridge East | Cofferdam West | Berth 1 |
| Leocem Gate | Baggage shed | Berth 2 |
| Generator Area | Socfin | Buffer Zone |
| Cofferdam East | Workshop | Savage Square |

For clarity and simplicity, the average values of all data for the different sampling zones are accounted for and presented on monthly basis. This document being the annual environmental monitoring report, a careful study is made in the trend of atmospheric data for both the biannual and annual reporting period.

Table 10: Average atmospheric data per month (August 2023 – January 2024)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **SAMPLE POINT** | **PM2.5 (µg/m3)** | **PM10 (µg/m3)** | **AQI** | **Temperature (oC)** | **Relative Humidity (%)** | **Formaldehyde HCHO (mg/m3)** | **SOUND (dB)** | |
| **MAX** | **MIN** |
| **August** | 19.3 | 36.1 | 41.7 | 33.5 | 65.7 | 0.03 | 63.4 | 52.3 |
| **September** | 27.6 | 41.9 | 58.5 | 31.4 | 59.3 | 0.03 | 66.3 | 46.0 |
| **October** | 21.4 | 36.0 | 57.6 | 30.2 | 62.05 | 0.15 | 73.9 | 48.2 |
| **November** | 19.8 | 29.1 | 37.1 | 30.15 | 61.3 | 0.1 | 69.6 | 50.7 |
| **December** | 23.1 | 30.6 | 51.4 | 31.6 | 55.1 | 0.02 | 68.1 | 45.3 |
| **January** | 20.4 | 33.7 | 42.3 | 33.5 | 51.8 | 0.05 | 64.9 | 44.2 |
| **MAXIMUM PERMISSPLE LIMIT** | 24hrs – 15 | 24hrs – 45 | 0-50 |  |  | 0.1 | 70 dB | 45 dB |
| Annual – 5 | Annual - 15 |
| **REFERENCES** | WHO AQG (2021) | | Air Quality Communication  El Salvador (2012) |  |  | WHO, 2010 Short and long-term exposure | Compendium of WHO and other UN guidance on health and environment 2022 | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **SAMPLE POINT** | **PM2.5 (µg/m3)** | **PM10 (µg/m3)** | **AQI** | **Temperature (oC)** | **Relative Humidity (%)** | **Formaldehyde HCHO (mg/m3)** | **SOUND (dB)** | |
| **MAX** | **MIN** |
| **February** | 24.68 | 41.98 | 92.80 | 44.4 | 59.06 | 0.04 | 72.11 | 60.28 |
| **March** | 26.96 | 45.16 | 75.82 | 43.47 | 54.29 | 0.06 | 70.75 | 61.26 |
| **April** | 22.86 | 28.22 | 108.96 | 40.38 | 54.18 | 0.01 | 71.17 | 64.23 |
| **May** | 27.02 | 30.20 | 64.78 | 30.6 | 67.18 | 0.01 | 68.79 | 61.86 |
| **June** | 19.36 | 26.02 | 73.73 | 31.02 | 71.88 | 0.02 | 80.89 | 69.75 |
| **July** |  |  |  |  |  |  |  |  |
| **MAXIMUM PERMISSPLE LIMIT** | 24hrs – 15 | 24hrs – 45 | 0-50 |  |  | 0.1 | 70 dB | 45 dB |
| Annual – 5 | Annual - 15 |
| **REFERENCES** | WHO AQG (2021) | | Air Quality Communication  El Salvador (2012) |  |  | WHO, 2010 Short and long-term exposure H | Compendium of WHO and other UN guidance on health and environment 2022 | |

Table 11: Average atmospheric data (February to July 2024)

## **Atmospheric data analysis:**

Looking and comparing the values of the various atmospheric parameters monitored, the following are observed, coupled with the respective expert recommendation(s):

1. NSBT operates on an 8 working hours policy, therefore the WHO 24hr – 15 standard for both PM2.5 and PM10 are considered. Assessment of the values from Table 10 indicates that; Particulate Matter (PM) 2.5 and 10 throughout the reporting period are above the permissible limits, though not at alarming rates. However, the PM10 for September is acceptable and the results show a consistent trend for PM values respectively throughout.
2. Values for the Air Quality Index were fairly good for the first reporting period and high – above permissible limit for the whole of the second reporting period. This is not negligible and management, through the HSE is expected to put strict measures in place to control air pollution within the company’s concession area.
3. The temperature and relative humidity are relatively not bad, though there were noticeable fluctuations. However, it cannot be fully established that causes of PM variation can result from NSBT’s operation. The global change in climate patterns for which Sierra Leone experienced severe effects this year. Notwithstanding, NSBT management is encouraged to identify ways of committing to the national climate change fight.
4. Formaldehyde (HCHO) readings were good and within permissible limit for both reporting periods. This shows a healthily safe environment for work. The management is encouraged to maintain or improve in this area.
5. The sound levels were high, but can be as a joint contribution from all components of the quay. Management however, ensures the provision of ear morphs to staff within areas with high sounds, especially heavy duty operators.

**Limitation:**

The readings for the month of July was absent do to the consulting team’s desire to meet the EPA-SL timely EMR submission standards. However, the monitoring continued and will reflect in the next report for NSBT.

**3.7 General Sanitation, facility safety, and Assessment**

**NSBT Facility Management:** This aspect of monitoring and guidance identification carries in to help link the relationship with water, system flow, and structural design with management actions using a matrix as applied with “Environmental Health and Sanitation”. Good housekeeping is perquisite for healthy work place and its forms the bases for ISO14001. Work premises and space determine the conveniences for staff breathing and eventually can reduce disease transmission amongst workers and as well help in reducing the likelihood of fire outbreaks, as well as firefighting commitments. To achieve that, different checklists were developed by the consulting team to ascertain proper management of the entire facility

# Table 11. Sanitation, drainages, and security

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Features** | **YES/NO** | **RATING** | | |
| Good | Moderate | Poor |
| Training of staff on safety handling | YES |  |  |  |
| Availability of Space | YES |  |  |  |
| Proper Drainage flow within the company’s Facility | YES |  |  |  |
| Availability of clean water supply | YES |  |  |  |
| Availability of temperature regulatory equipment | YES |  |  |  |
| Are windows built with guards and meshes to prevent the entry of dust and insects? | YES |  |  |  |
| Are there enough exits to allow prompt escape? | YES |  |  |  |
| Are light fixtures in good condition? | YES |  |  |  |
| Are all work areas clean and free of debris? | YES |  |  |  |
| Are stored materials properly stacked and spaced? | YES |  |  |  |
| Is permanent wiring used instead of extension cords? | YES |  |  |  |

**3.7.1 Fire Safety Management**

NSBT herein agreed to comply with the National Fire Force regulations and also adopt international and standards on fire safety since it is multi-national (Basically; foreign nationals, Sierra Leonean, and Ghanaian), the International Labor Organization (ILO; 134a.) has also been used as referenced guideline for chemical handling and fire safety:

**Table 12. Fire Safety Management and Assessment**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Yes** | **No** | **Action Required** |
| Does the company have a fire safety certificate? |  |  | See certificate in appendix |
| Does the company have an emergency plan in case of fire or other emergency?  (This covers areas as follows; evacuation routes, assembly areas, fire extinguishers and first aid locations, telephone numbers for fire brigade and hospital. |  |  | The company’s safety department is always in readiness with easy movement when in action. |
| Are all workers familiar with the emergency plan, trained in its use, and regularly involved in testing it? |  |  | When developing an emergency plan, workers should be knowledgeable with the emergency plan document. |
| Are the procedures followed indicated throughout the factory and in a format and language that the workers can understand? |  |  | The company should provide fire safety procedures within the entire facility, and in a clear language |
| Are there regular evacuation drills and alarm tests to evaluate the effectiveness of the emergency plan? |  |  | Evacuation drills/ alarm systems should be accounted for in the emergency plan |
| Are there existing means of fire detections? |  |  | Check regularly to ascertain working status |
| Can existing means of detection (e.g. smoke detectors) discover a fire quickly enough to raise the alarm in time so that all workers can escape to a safe place? |  |  | Add on existing ones or repair/replace damaged ones |
| Can the fire alarm be heard clearly throughout the entire factory even when initiated from any single point? |  |  | The alarm should be unique and audible within the facility |
| Is the alarm system electrically powered with the availability of a backup power supply? |  |  | It should have a constant power source |
| Do all workers know how to operate the fire alarm system? |  |  | Workers need to be trained in using fire alarm system |
| Are there enough fire exits in the correct location for all workers to escape in the case of an emergency? (e.g. at least two on each floor) |  |  | There are wide entrances that allow the passage of more than five people parallel to each other |
| Are the type and size of the exits suitable and sufficient for the number of workers? |  |  | Exits are wide and suitable for the staff size |
| Are all escape routes easily identifiable, free from obstructions and clearly illuminated? |  |  | Routes are free and clear from obstructions |
| Are all exit doors labelled/lit, unlocked and designed to open outwards? |  |  | Safety department should ensure that |
| Are the extinguishers suitable for the type of fire (e.g. class A and B) and of sufficient capacity? |  |  | No distinct differences for the different classes of fire |
| Are there sufficient extinguishers sited throughout the factory? |  |  | The facility has fire extinguishers in all sections/units |
| Are the locations of extinguishers and fire hoses identified and unobstructed? |  |  | Fire extinguishers are well fitted without hindrance for use at any time. |
| Has any NSBT personnel been trained to use extinguishers and fire hoses? |  |  | Yes; staff training is ongoing with the supervision of national Firefighting staff with protocols of the National Fire Force. |
| Are the fire extinguishers fully charged and inspected weekly/monthly? |  |  | The extinguishers are charged, since there |
| Are the fire extinguishers fully checked and tested periodically by an external competent authority? |  |  | Fire extinguishers are monitored by the consultant and the EPA-SL every session in the monitoring. |
| Are there fire/safety wardens on each floor/Unit of the factory who have been specifically trained in firefighting? |  |  | For each training session, every unit is expected to send a representative |
| Do these fire wardens wear identifying clothes so that all workers know who they are? |  |  | There is no identification of personnel doing firefighting either by tagging of other form. |
| Have warning signs been placed within the factory indicating that they must not be used in case of fire? |  |  | There are warning signs in some areas of the facility, but not everywhere |
| Is smoking prohibited in all working areas and "No Smoking" signs posted clearly and prominently throughout the factory? |  |  | There are restricting signs in some areas, but not entirely. |

## **3.8 by NSBT in the period under EPA-SL compliance**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Enlist of Constraints** | **Risk Rating Factor for EIA compliance** | | | **NSBT Perception** | **Expectations by NSBT management** |
| 0 | 1 | 2 |
| General compliance on Safety by other beneficiaries at the port |  |  |  | Obstruction to management Safety qualifiers | Joint enforcement with NSBT and SLPA |
| Threats from external neighborhood |  |  |  | Requires EPA-SL unilateral actions with other operators on best Practices | EPASL and NSBT enforcement on regulation |
| NSBT correspondence with Auditors |  |  |  | NSBT’s management is in full correspondence with all Auditors in respect to its operations in SL | NSBT’s management expects technical support from all auditing bodies |
| Exemptions for EPA-SL compliances |  |  |  | 3% deduction of license cost for complete compliance | EPASL appraisal and recommendation |

Table 11: Challenges, Perceptions and Expectations of NSBT Management

Risk Definition: 0-0 = No threats assumed **1**-1= moderate to high risk (Required preparedness and some mitigation enforcement 2-2= Major risk expected if not plan and mitigated.

## **CHAPTER FOUR**

## **4.0 NSBT COMMUNITY DEVELOPMENT ACTION PLAN ACTIVITIES IMPLEMENTED**

Table 12: NSBT Community Development Action Plan (CDAP) Budget Allocation, Projection, and Implementation

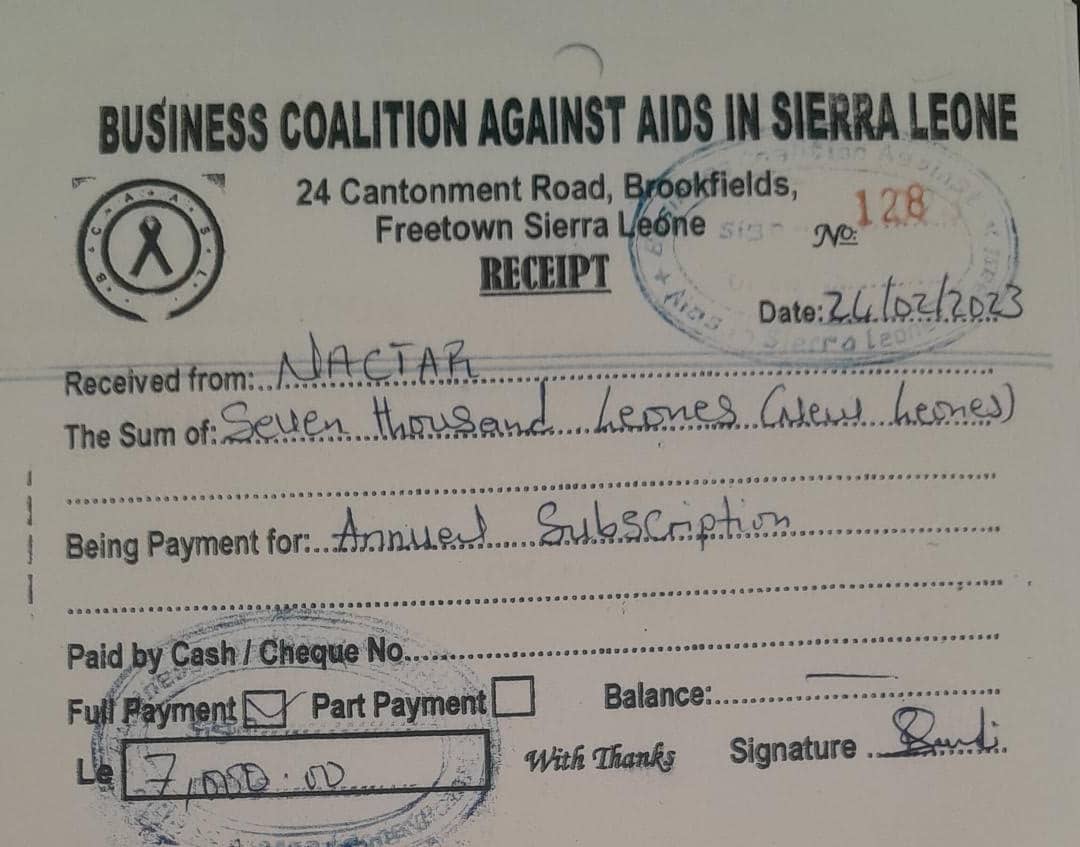
|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **No.** | **Project/Activity** | **Cost (NLe)** | **Status of implementation** | **Implementing Partners** | **Period of implementation** |
| 1 | 28 Set Desk & Bench for SLMB Primary School, Cline Town | 58,800 | 100% Implemented | ADKAIN | Sep – Oct 2023 |
| 2 | Text Books for SLMB Primary School, Cline Town | 15,000 | 100% Implemented – to be handed over to the school when school reopens in September | NSBT HSE | July 2024 |
| 3 | 30 Set Desk & Bench for SLMB Primary School Cline Town | 79,950 | 100% Implemented – to be handed over to the school when school reopens in September | ADKAIN | July 2024 |
| 4 | Waste collection for community support | 25,200 | Continuous on Monthly Basis | Shitanga Logistics | Throughout reporting period |

## **APPENDICES**

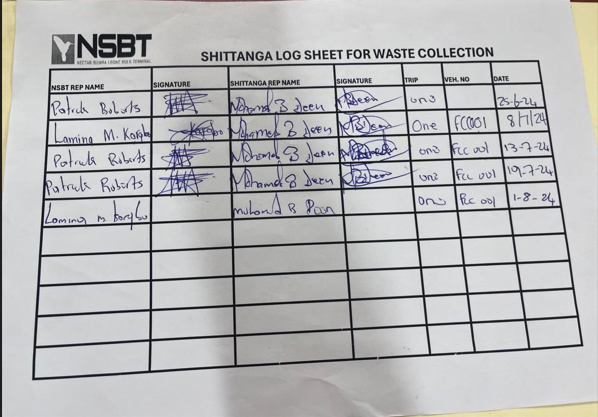
## APPENDIX 1: NSBT ALTERNATIVE ENERGY ADOPTION FOR CLIMATE CHANGE IMPACT



## APPENDIX 2: BUSINESS COALIATION AGAINST AIDS IN SIERRA LEONE ANNUAL PAYMENT RECEIPT BY NSBT



## APPENDIX 3: SHITANGA LOGISTICS WASTE COLLECTION INVOICE BY NSBT FOR COMMUNITY GARBAGE



## APPENDIX 4: 30 Set Desks & Benches for the SLMB Primary School, Cline Town

|  |  |
| --- | --- |
| C:\Users\Tiah\AppData\Local\Packages\5319275A.WhatsAppDesktop_cv1g1gvanyjgm\TempState\F5596548813F399FF7462396544F0F0C\WhatsApp Image 2024-08-05 at 15.27.20_74785f69.jpg | C:\Users\Tiah\AppData\Local\Packages\5319275A.WhatsAppDesktop_cv1g1gvanyjgm\TempState\816C69A2EE5190DB2CF3B54BE31BD117\WhatsApp Image 2024-08-05 at 15.27.22_038f82da.jpg |

## APPENDIX 5: Text books for the SLMB Primary School, Cline Town

|  |  |
| --- | --- |
| C:\Users\Tiah\AppData\Local\Packages\5319275A.WhatsAppDesktop_cv1g1gvanyjgm\TempState\3F1E82639DF713656D2571C55722201C\WhatsApp Image 2024-08-05 at 15.34.42_5f7469a6.jpg | C:\Users\Tiah\AppData\Local\Packages\5319275A.WhatsAppDesktop_cv1g1gvanyjgm\TempState\57FF0DE28727A37E8AEEF1BE5134C9C3\WhatsApp Image 2024-08-05 at 15.34.42_c6927514.jpg |

## APPENDIX 6: Waste Collection for the Cline Town community by Shitanga Logistics

|  |  |
| --- | --- |
| C:\Users\Tiah\AppData\Local\Packages\5319275A.WhatsAppDesktop_cv1g1gvanyjgm\TempState\F2E454EBE804DB692E8FD44475FD277F\WhatsApp Image 2024-08-05 at 15.28.20_b3882949.jpg | C:\Users\Tiah\AppData\Local\Packages\5319275A.WhatsAppDesktop_cv1g1gvanyjgm\TempState\4D6F3A093FA3C4D1989631ECFA10AEC5\WhatsApp Image 2024-08-05 at 15.28.22_8adaf2a5.jpg |

Appendix 7: Chemical Safety Data Sheet (CSDS) for NSBT/2023-2024

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Properties of Chemicals in Use** | | | | | | | | | | | | |
| **Name of Chemical** | **Hazard Identification** | | | **Suitable extinguishing agent** | **Handling and Storage** | **Accidental Release** | **Exposure controls** | **Physical and Chemical properties** | | | | **Toxicological Information on Biota** |
| **PH** | **Viscosity in Water** | **Solubility in Water** | **Miscibility in Water** |
| **Water** | **Soil** | **Biota** |
| Engine Oil |  |  |  | Water-based extinguisher | Should be kept in a clean, dry, and cool environment with a temperature of 40 and 80℃ | Workers should try to contain the spill as quickly as possible to prevent it from spreading using oil absorbent materials such as “sand, wood dust and turpentine” | The effective use of PPEs (e.g; gloves, goggles, respirator and ear plugs and /ear muffles if needed) | 7-8 | 5-40 | 0% | 0% | Cause skin irritation and eye irritation. Inhalation of engine oil fumes can also cause respiratory irritation. |
| Lubricant oil |  |  |  | Water-based extinguisher | Should be kept in a clean, dry, and cool environment. | Workers should contain the spill. Secondly, the spill should be cleaned up with absorbent materials. absorbent materials such as “sand, wood dust and turpentine” | Workers should wear protective clothing, including gloves and eye protection. | 8-9 | 20 - 200 | 0% | 0% | Cause skin irritation, eye irritation, and respiratory irritation. |
| Transmission oil |  |  |  | Water-based extinguisher | Prevent exposure from dusty environment, improve temperature control, and protection from light in order to attain temperature of 40 and 80℃ | Workers should be trained on spill management in NSBT Tool Box Talk (TBT).  The spill should be cleaned up using absorbent materials such as(sand and wooden dust or shaving) | Enforce the use of PPEs for workers | 8-9 | 20 - 80 | 0% | 0% | Causes skin and eye irritation, as well as respiratory irritation. |
| Hydraulic oil |  |  |  | Water-based extinguisher | Prevent exposure from dusty environment, improve temperature control, and protection from light. | Staff should control spills and work around oil traps and enforced the use of rags clothing to enhance absorption of any possible oil drops the spill. Prevent contact with any ignition sources should be removed from the area | Prevent mislabeling of contents and use correct draining equipment(Funnel, lever systems and oozing tube) whenever in use | 7-8 | 10-100 | 0% | 0% | It can cause skin irritation, eye irritation, and respiratory irritation |
| Engine cleaner /degreaser |  |  |  | Water-based extinguisher | Placed in a ventilated area, maintain temperature control, and protection from ignition sources. | Contain the spill. Once the spill has been contained, the area should be ventilated to prevent the build-up of fumes. | Enforce the use of PPE (including gloves, eye protection, and a respirator). | 9-10 | 5 - 50 | 0% | 0% | Causes liver and kidney damage with repeated or prolonged exposure |
| Oil spill removal |  |  |  | Water-based extinguisher | Protects content from low humidity storage, maintain room temperature, and protects products from ignition sources. | Spillage should be contained to prevent the oil from spreading using absorbent materials such as sand, wood dust and sandy-clay soils, or straw should be used to absorb the oil. | Workers should wear Enforce the appropriate use of PPEs through training and field practical lessons quarterly | 7-8 | <10 | 80% | 70% | Toxic to marine life. |
| Brake fluid |  |  |  | Water-based extinguisher | Monitor temperature, light exposure, and shelf life. | Effect physical controls of stores and handling using ventilated stores Contain the spill. If spills on floor used absorbent materials, such sawdust, kitty litter, or clay, should be used to soak up the fluid | Workers should wear Enforce the appropriate use of PPEs through training and field practical lessons quarterly | 7-8 | 2 - 10 | 0% | 0% | Can be harmful if swallowed or inhaled, so it should be handled with care |
| Coolant/Anti freezer |  |  |  | Water-based extinguisher | Make registration of all ACs and other coolant/anti-freeze products should be stored in a cool, dry environment. | Contain the spill and prevent it from spreading. Next, absorbent materials should be used to clean up the spill. | Workers should wear appropriate personal protective equipment, including gloves, eye protection, and a respirator. | 8-10 | 15 - 30 | 67% | 30% | It is important to avoid breathing in the fumes of coolant/anti-freeze. |
| Petrol |  |  |  | Water-based extinguisher | Store in a cool, dry, and well-ventilated area, prevent contamination when in transport and storage in man-holes and drums | Immediately create caution tape demarcation and use sand and clay dust to prevent spreading and contact with flammables and sparks. | Workers should wear personal protective equipment, including gloves, eye protection, and a respirator.. | 5-8 | 0.3 - 0.5 | 0.4% | 0% | Skin irritation |
| Diesel |  |  |  | Water-based extinguisher | Temperature control, ignition source protection, ventilation, and approved containers. | Contain the spill and prevent it from spreading. | Workers should wear personal protective equipment, such as gloves, eye protection, and a respirator. | 6-8.0 | 2 - 6 | 0.05% | 0% | Skin irritation |