

**NECTAR SIERRA LEONE BULK TERMINAL (NSBT)**

**FREETOWN, SIERRA LEONE**



**BULK AND BREAK-BULK TERMINAL DEVELOPMENT**

**ENVIRONMENTAL AND SOCIAL HEALTH IMPACT ASSESSMENT (ESHIA) REVIEW  
STUDY**

## CONTENT

### Acronyms



No	Abbreviation	Depiction
1	AC	Air Condition
2	CEA	Socio-Economic Assessment
3	CDAP	Community Development Action Plan
4	DSL	Department of Survey and Land
5	DLCP	Department of Land and Country Plan
6	Db	Decibel
7	DOE	Department of Environment
8	EIA	Environmental Impact Assessment
9	ESIA	Environmental Social Impact Assessment
10	ESHIA	Environmental Social Health Impact Assessment
11	ESMP	Environmental Social Management Plan
12	EMP	Environmental Management Plan
13	FGD	Focus Group Discussion
14	GoSL	Government of Sierra Leone
15	HRG	High Risk Goods
16	ILO	International Labour Organization
17	IUNC	International Union for Natural and Conservation Services
18	ISO	International Standardization Organization
19	IBP	Industrial Best Practices
20	MAFFS	Ministry of Agriculture Forestry and Food Security
21	MSDS	Material Safety Data Sheets
22	MOH	Ministry of Health
23	MTA	Ministry of Transport and Aviation
24	MHWN	Mean High Water Neaps
25	MLWN	Mean Low Water Neaps

<b>26</b>	MLCPE	Ministry of Land Country Planning and Environment
<b>27</b>	NEAP	National Environmental Action Plan
<b>28</b>	NEP	National Environmental Policy
<b>29</b>	NEBP	National Environmental Protection Board
<b>30</b>	ODS	Ozone Depletion Substance
<b>31</b>	OSHA	Occupational Safety Health Administration
<b>32</b>	SLPMB	Sierra Leone Producing Marketing Board
<b>33</b>	SLPA	Sierra Leone Port Authority
<b>34</b>	SLPR	Sierra Leone Port Revenue
<b>35</b>	SLEPAB	Sierra Leone Environmental Protection Agency Board
<b>36</b>	SEA	Strategic Environmental Assessment
<b>37</b>	SHUC	Safe Handling and Usage of Chemicals
<b>38</b>	SSWM	Sustainable Solid Waste Management
<b>39</b>	RER	Rapid Environmental Review

## **Executive Summary**

As one could see, sustainable environmental management at the quay requires the willingness by all operating clients within clearing and forwarding of goods at acceptable standards in the Port Authority operating zone to take responsibility in environmental protection and Industrial Best Practices (IBP), with many probably operational influences on environment and human livelihood setting. According to ‘S.selvakumar<sup>1</sup> and R.k.c.jeykumar<sup>2</sup> in their abstracts on Environmental Impact Assessment on Building and construction explains the significant of EIA study necessary because its gives detailed account of environmental impact of the proposed activity so that appropriate interventions can be seeing’. However, the management of NSBT carefully identified overlaps on its Environmental Terms of Reference (TORs) regarding their existing Environmental Social Health Impact Assessment (ESHIA). These anomalies are affecting the company obligations to environmental management and monitoring, with an understanding to few operational mismatch to activities and process indicators. Therefore, management of NSBT consider a review of its existing ESHIA through an acceptable bidding process as set by its auditing codes of conduct, in hiring the service of Njala Environmental Technicians (NET), under the stewardship of MR. Mohamed Dumbuya, to carry a Rapid Environmental Review (RER) of company existing ESHIA with simple modifications. Within the terrain under review, NSBT is occupying its concession from the parent mapping of Port Authority concessional land of N- 829’38.61’’, 829’38.60 and W- 1312’36.97’’, 1312’36.05’’.

However, there are relative developments on environmental risk reductions and staff capacity enhancement, in all established zones of NSBT. An extension to the additional administrative block in the additional plots has its justification on company reduction to human risk prone and property safety, with the motive to bridge NSBT main counterpart like Nectar Group United Kingdom to its operations. An economic equilibrium system also assessed from the previous ESHIA report, with a slight over speculations to company profit returns and community benefit and shares.

The consulting team herein refers to NET, would have to carry a Rapid Baseline Investigation (RBI) through acceptable marine-time codes of conducts and Environmental Protection Agency Sierra Leone guidelines, with a complete knowledge on NSBT operational process at the Queen Elizabeth II Quay for a justifiable impact assessment study to produce one working EIA document for NSBT. As prospect to the proposed project, there is a reality to have a balance on compliance and profitability scale.

### **The Environmental and Social Health Impact Assessment (ESHIA)**

The goal is to achieve a project that fully entrenches the real concerns of NSBT operational environment auditors and society into the decision-making process to allow design vicissitudes to occur and thus provides the need and direction for an explicit mitigation measures. The concept of avoiding impacts that could be sever is preferred. ESIA, in another way, is the first part of the process that tries ensuring positive and negative impacts from the project understanding by the people. As positive impact are enhance by project design, while negative ones are mitigated,

without compromising the economic efficiency of Nectar Sierra Leone Bulk Terminal (NSBT) and its affiliate like Sierra Leone Port Revenue Collection(SLPRC).

The scope of this environmental assessment review covers the physical extent of the project, site location and its immediate environs, proposal on administrative extensional phase, operation phase and decommissioning phase. Key aspects to the review exercise were in note of all relevant standards, legal and regulatory framework. The interaction of NSBT operations to other facility providers like the Port Authority, Bollore etc. were trapped in the investigation. Land use, Socio-economic environment; project influences on open environment and management possibilities to Health and safety preparedness.

### **Objectives of the ESHIA**

In Sierra Leone, the Environmental Protection Agency (EPA-SL) regulates environmental management. This is in accordance with the provisions of the EPA-SL Acts of 2008 and 2010. Pursuant on environmental recognition through the prevailing of legal requirements by EPA-SL Act. NSBT has it comprehensive challenge in trying to ensure sustainable environmental management; the proponent (NSBT.) undertakes this EIA review process for its facility operation at the Queen Elizabeth Quay. The review exercise of ESHIA will address apparent issues and provides relevant information for environmental considerations to project proponents. Distribution of Standards', to ensure that the environment and stakeholders experience project benefits; with protection from potential negative impacts. The target is that stakeholders and NSBT management accept the reason for environmental compliance and social corporate responsibilities.

Another objective sense is to ascertain correctness and reduce biases that could undermine operational efficiency. Methodologies for review of ESHIA document set in under the approved benchmark of field survey and assessment qualifiers; such as: environmental, social, Health, institutional, political and economic surveys, comprising data recording, sample collection, analyses in concert with consultations.

### **General Objectives on the review ESHIA is to:**

- I. Provide information on NSBT operational footprints to environmental issues that might affect physical land resources and people's welfare.
- II. Provide a review on mitigation/prevention strategies and pointing out constraints that have direct influences to NSBT environmental monitoring of impacts. This may require appropriate technological development and adoption.
- III. Integrate those strategies into an Environmental and Social Management Plan (ESMP) and a monitoring schedule to ensure compliance with the provisions in the ESMP.
- IV. Identifying potential variables on influences by other companies interest for incorporation into a Community views.

### **Specific Project Objectives and Outputs:**

The following are the Specific Company Objectives and Outputs.

- I. Establish a business of Cargo handling services, consultancy and logistics services
- II. Facilitation of bulk discharge, bagging and delivery of items to clients via trucks through modern terminal management principles.

The operations of NSBT as company involves both **Direct** and **Indirect Delivery** of unload item(s).

**Direct delivery:** by context involves direct discharge of the goods. The vessel with incoming goods berth at the port under the facilitation of NSBT, thereafter the client has to take full responsibility for the goods as require to be delivered. Custom and shipping protocols must been recognize, according to SLPA Terms of Reference (TORs).

**Indirect delivery:** involves storage or warehousing of the customer(s) goods for a period of time delivery whiles awaiting costume or shipping procedures.

## **General Information on Port and Harbour Sector**

Ports Authority and its harbours are the gateways of maritime trade as also inland transport. The need to enhance the standard of living of Sierra Leoneans due to potential rise on continual growth of national economy with rapid industrialization and communalized development of all associated sectors of the country as a whole. Inasmuch as maritime transport is economical and the only means to transport larger volumes of cargo across oceans, ports and harbours are, therefore, called upon to handle larger volumes of cargo throughputs of both raw material as well as products. Thus demand for handling bigger size ships and use of enhanced technologies with state of the art cargo handling systems require augmentation of services or facilities at existing ports. However, port development on operational activities may create a wide range of impact on the environment through activities like reclamation, construction work, development of utilities and services, discharges technological compatibility from ships, cargo operations and other port related activities. The potential adverse effects of NSBT operations at the Queen Elizabeth II Quay establishment will encompass Solid waste generation, air pollution, noise pollution, and socio-cultural impact. The preparation of EIA report and implementation of EMP are essential in address the any consequence that could led to adverse effects.

## **The Project**

In response to increasing demand for goods and services in Sierra Leone has made direct positive trigger on NSBT services in Sierra Leone, the project prospect will contribute to human Livelihood uplift that's' ranged from technology transfer, zero tolerance to discrimination or social conflicts amongst workers. The Government of the Republic of Sierra Leone (GOSL) through the Ministry of Transport and Aviation (MTA), Sierra Leone Ports Authority (SLPA) and the National Commission for Privatization (NCP) is committed to providing an enabling environment for trade promotion and port activities. The Nectar Sierra Leone Bulk Terminal (NSBT) is a company established under the laws of Sierra Leone and having its office at 45 Cline Street, Cline Town, and Freetown, Sierra Leone and has acquired a leased agreement at Queen Elizabeth II Quay through the Sierra Leone Ports Authority (SLPA). Nectar Sierra Leone Bulk Terminal(NSBT) Limited anticipate to establish such business of Cargo operations, Bulk discharge, Bagging, Expediting, Consultancy services, Terminal management, and Logistics all of these services are carried except for a delivery of goods beyond the port boundaries . The proponent will enjoy income generated through service delivery. It will create new opportunities for other entrepreneurs', services providers, and even academic scholars as a new trend in the country. Many secondary businesses are also likely to spring up due the presence of NSBT.

## QUANTITATIVE AND QUALITATIVE DATA REVIEW AND ANALYSIS

### Methodology on Socio-Economic Assessment (SEA)

As the ESHIA in context, implicit to wider area in consultation, which allows a full-blown information gathering on the report. Therefore, the aspect on the review work will apply similar assessment methodology to streamline activities of NSBT through by; available literature, interviews of stakeholders around project delineated areas in Freetown as well as interviews with company staff.

### Interviews

Stratified interviews of grouped and one-to-one conversation with key technical authorities carried using ‘Groupthink’ technique and self-administered questionnaire approach.

The review also consider representatives and /or staff of Government Agencies whose activities are likely to impact on the proposed company activities as could include:

- Sierra Leone Maritime Administration (SLMA);
- Environment Protection Agency – Sierra Leone (EPA-SL);
- the Sierra Leone Ports Authority (SLPA);
- the Ministry of Transport and Aviation,;
- the National Commission for Privatization(NCP)
- Ministry of Health and Sanitation (MOHS);
- Sierra Leone Investment and Export Promotion Agency (SLIEPA).
- Officials of the NSBT management team;
- Workers of the NSBT

Selection of Ministries and Agencies in review will help in ascertain NSBT recognition and legality for its existence in the Port Authority governing terrain. Such a classified population should express assessment of opinions and dialogs for opportunities between NSBT and beneficiaries as key stakeholders in the research. A probing structured Socio-economic questionnaire and checklist are prepared.

### Methodology for hazard and Risk reduction assessment

**Overview:** ‘From Health Library for disaster’ In qualitative hazard analysis, the frequency or likelihood of an event is described in words such as ‘highly likely’ ‘likely’’, ‘possible’’, ‘unlikely’’, etc. these words may be related to time periods.

In process of working order by NSBT, there is moderate to low operations at the work premises within the period of review, with careful assessment to NSBT management on accidental risk and hazard control. The EPA-Act 2008 amended 2010 and factory’s Acts of Sierra Leone-1974. All

work premises must take responsibility in protecting lives and the environment through improving compliances to guiding standards.

### **Hazard Reduction assessment:**

The work in this direction would focus mainly on potentialities for hazards happening and risk prone. Group thinking approach used to collect independent information by sharing their views/ comments and recommendation for any management through written papers and submit; by so doing, the research had an inclusion of least worker opinion(s) in the evaluation. Extent, period and manageability efficiency would be assess along for better preparedness and mitigation by NSBT.

### **Physical/Abiotic environmental assessment**

Conditions on abiotic data could be key area to emphases in the review, as NSBT consider its delineation on many operational foot prints which the review work would integrate additional data for a justification on the atmospheric environment within Port authority and NSBT concession. Criterial data such as ambient temperature, dew point and wet bulb temperature, percentage Relative humidity and noise levels would be determine in the research.

### **Chemical environmental assessment**

This aspect on review identifies main chemical threats of NSBT interaction at the Port Authority environs, but with critical assessment and evaluation for the past five months in records. Data shown cause for comprehensive environmental assessment, for general influences on dosage source per polluter at the port environment. The nature of terrain slope or gradient would exacerbate NSBT cost on monitoring and management. As the quantum of flying ash and clinkers, flew as dust like disposition on frontage of NSBT and edge of Quay bank. Sweeps of these dust would be assess with edge waters for an understanding on level of dosage. Key parameters as heavy metals and acidity concentration would be assess to develop a sharing Chemical management plan for NSBT workers and the general working population at the Quay.

### **Biological environmental assessment**

Although, NSBT activities has much insignificant impact to the river and its surrounding estuarine platform of the Rokel River Creek. The company still recognized its administrative housings and facilities services within the fringes or confine of the port area which characterized of the marine and terrestrial environment, so must its consider a quantification of company operation as relative to deposition of waste, environmental alteration like: Sanitary discharge and engineering control assessment, marine population assessment and physicochemical assessment of the water.

## **Capital investment**

NSBT consider its capital outlay as well enough to carry out all of its expectations in lined with compliances that range from taxes, cooperates responsibilities, sustainability pillars for management and workers welfare. Therefore, according to media review: NSBT have invested around £3.5 Million on the purchase of equipment & training facilities, the refurbishment of facilities like the warehouse etc. with the various challenge faced by management, growth rate dynamics was classified to be admirably. Since its growth, impact has integrated into mass scale employment with over hundred (100) staff enlisted with NSBT working diary. As was agreed by the previous ESHIA studies, management of NSBT has set aside \$1.010, 333 for its full integral operations with the new establishment block sponsored by Nectar Group UK, but NSBT has kept aside a contingency fund of 10% from the capital outlay, which estimated as \$350.000. For the attainment of key areas like the mitigation of Hazard and Risk prone and events, Environmental Management Process (EMP) and Community Development Action Plan (CDAP) together with the pursuance of licenses.

## **PROPOSED CAPITAL INVESTMENT BY NECTAR GROUP LIMITED UK**

Nectar Group being key financier to NSBT, has in proposal to integrate the remaining buildings of SLPAC within the same working environment would carry a facelift project that could give NSBT more space for its growth function, with the following infrastructural development in mind. The project is expecting to start in 2017 and ends in 2020 with complete refurbishment to the existing buildings. This parent body has enforced the concept for integration of its international expertise to work on project in four (4) phases. The project shall be a compliance adherence to EPA-SL and other international standards, the cost for such intervention would expect to reach approximately \$368,243.55 for the four years aforementioned.

Expectation of the project realities can be justify with the present operational management, with the increase of environmental beautification and safety adherences.

## Project Layout and Activities



Figure 1 Project Layout.

NSBT FACILITIES AND HOUSING	PROPOSED NECTAR GROUP ESTABLISHMENT
Security post	Proposed warehouse 1
Locker room	Cold store
IT-Room	Proposed admin block
Workshop	Proposed warehouse 2
Admin office	Suma building
Training centre	
Shed 1 and 1A	
Port Fire Force	
Warehouse	
Cement shed	

NSBT ORGANOGRAM

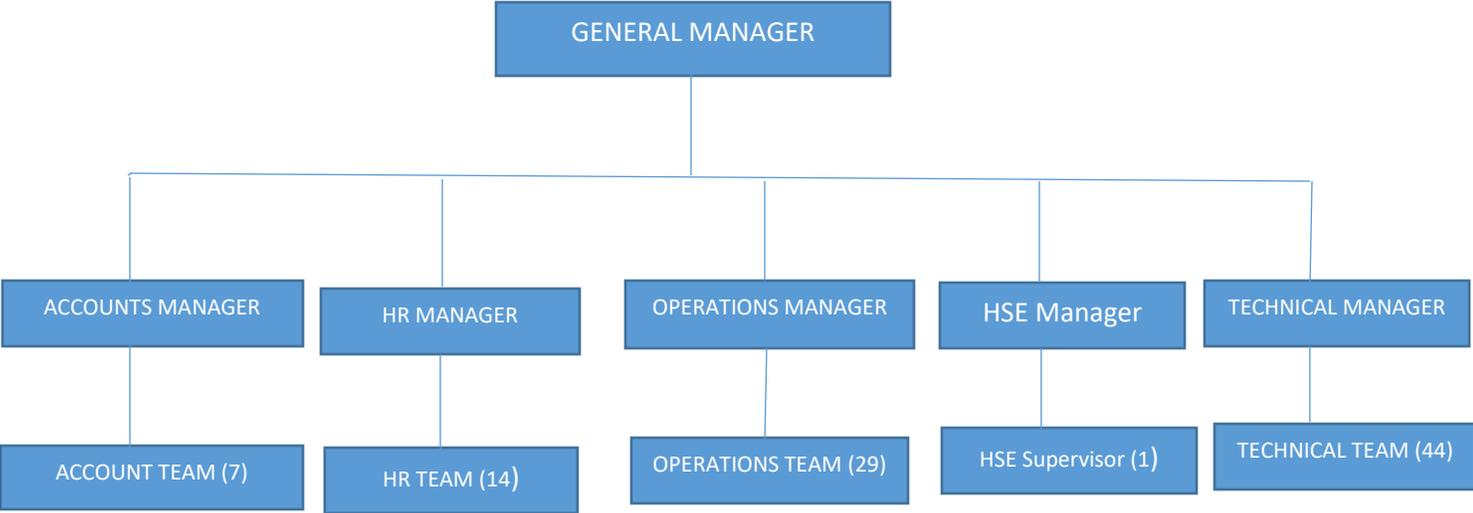


Figure 2. Showing NSBT Organogram

## Justification on NSBT Establishment in Sierra Leone

### **Sierra Leone News: NSBT donates fire engines to SLPA**

Nectar Sierra Leone Bulk Terminal (NSBT) has donated two fire engines to Sierra Leone Ports Authority (SLPA) on Tuesday at the Queen Elizabeth II Quay.

In his address the General Manager of NSBT Jim Page said they had their presence in Freetown since October 1988 when they first assisted in bagging imported rice from bulk vessels. "In doing so we reduced the costs of rice importation and introduced efficiencies. Since then our Company has developed globally with the introduction of the management of Bulk terminals being brought into our list of experiences."

In 2013 Nectar Group won the prestigious IBJ award for the 'Best Specialist Bulk Port or Terminal' for their work at the 5 MTPA Beira Coal Terminal. Mr Page said NSBT is a Joint Venture Company between Sierra Leone National Shipping Company Ltd. and Nectar Group Ltd. of the United Kingdom. In his address, the Chairman of National commission for Privatization (NCP) Lawyer Kabba Koroma said this is the first donation ever to Ports Authority and it is very commendable. "This donation comes at a time that the Ports is challenged with fire engines and these two engines will definitely protect the quay and the Cline Town community in case of any fire disaster." The NCP Chair hopes that other tenant in the Ports will follow suite to help make the quay very safe and accommodating as he said they are looking to turn the Queen Elizabeth Quay to a trans-shipment port, which he said would create more jobs and develop the economy. "I implore the management of SLPA to take good care of these engines as they are not cheap. We want them to be operational at all times and be ready to go to work whenever called upon. "He thanked NSBT and said he is hopeful they will continue to do more in the future as they have a very good working relationship with Bollore and Ports Authority. Minister of Transport Leonard "Balogun Koroma" who commissioned the two engines said transport facilitates growth and development in the other sectors of the economy such Trade, Tourism etc. Since our government's Agenda for Prosperity was launch, I can boldly declare that His Excellency's desire has been to see the Transport Sector rise to the status of being the "heart beat of the Economy" and recent activities within the sector have been speaking to that. "The minister averred that the event is built on the foundation of Relationship and trust. Sierra Leone's relationship with Nectar Group he said can be traced back to the year 1988 when Nectar was to discharge 9,700 metric tons of rice under PL480 Aid Programme from a barge called the "Amy Thompson". "Since then we can boast of a cordial and more fruitful relationship with Nectar." Leonard Koroma said the government could proudly say they appreciate the work NSBT is doing and the impression they've created in the first 18 months of their operations at the Sierra Leone Ports Authority. "They have invested around £3.5 Million on the purchase of equipment & training facilities, the refurbishment of facilities like the warehouse etc. Despite the numerous challenges they are being faced with we've seen NSBT growth rate to be commendable, as it has grown from a mere concept on a piece of paper to a fully operational company with well over eighty (80) staff of which about 96% are Sierra Leoneans." The Minister said they hope that this intervention will help the Sierra Leone Ports Authority to comply with the ISPS Code; reduce risk and fatalities at the Port; boost the work of the Local Ports team as they will now have the right tools to execute their work and It will aid in the training of a reserve team comprising SLPA & NSTB Staff members to be done by the Sierra Leone Fire Force.

Thursday March 09, 2017

Internet source information on NSBT relation and affiliation in Sierra Leone

## **SITE SELECTION PROCESS**

**Overview:** Site selection for NSBT project remain to be a direct influence from its vision and mission clauses, though there are relevancies connected from environment to socioeconomic comfortability. Management of NSBT selected Port environment as appropriate zone for their proposal in doing cargo and harbour stewardship in Sierra Leone.

### **Relevance to Environment:**

As NGL as the mother company, as internationally recognize in many countries. That rely on shipping and offloading of cargos, management considers' an extension to West Africa- Sierra Leone to be specific as a better place to integrate due to the country strategic hydromorphic characteristic and easy sailing to the harbour with appreciable depth for buoyancy at peak loading weight. The oceanographic dynamics of the river running the Quay, has a history of stable continental ridge for water current so could it enhanced easy anchoring of boats/ships. Therefore, the extensive study has it steps from proposal, screening, scoping and full study. Detail site screening has been submitted at the initial study, actions from EPA-SL mandated the process of the full study to be carried. With much curiosity by NSBT management, a called for a review to the same document with an anticipation to have equity in challenges and shares to responsibilities.

### **Relevance to Socioeconomic:**

The main aim of NSBT in Sierra Leone is to accelerate the process of cargo loading and offloading, with extra facilities like warehousing and technical consultancy services rendered. These services laid on nearness to infrastructures, utilities services, security and access to banking facilities. These aforementioned, continues to stimulate the scope of NSBT mission in Sierra Leone, thus the management also receives pleasure in its recruitment process and services since there is access to labour forces which continues shown impacts in Sierra Leonean Economy on tax revenue boost due to improved services and contact hours for screening of goods.

## Community and stakeholder engagement

The review studies uses stratified sampling from the previous sampling data. Therefore, key community groups and persons were contact in the community and technical stakeholders are also stratified and allows the team to engaged only four technical stakeholders. The slant adopted for this exercise would drives and build on prior importance to project realities.

### A stakeholder list:

This was to help develop a networking and partnership plan for the project life cycle.

**Table 1. List of stakeholders**

Stakeholder	Stakeholder details	Expectation note
Local Authorities	Councillor, local chiefs, head men/women and Youth groups	Partner with them to ensure consistence with community development initiatives, resolve socio-cultural issues, satisfy legal requirements as stipulated by local and/or traditional laws.
School authority	Cline town, Fourah bay and Moa wharf	Collaborate with them for capacity building, exchange of labour and capital.
Sierra Leone Port Authority and Customs	Port Authority Environmental Head Custom external or outreach units	Site security, exchange of technical expertise, marketing of NSBT project, employment, Combine environmental management planning for sustainable working relationship.
Sierra Leone Standard Bureau	SLSB port Staff attaché	Collaborate on equipment calibrations and product handling guide
Line ministries and departments	Environment; EPA-SL, Ministry of Health, Ministry of labour	Registration for legal status, acquiring licenses, compliance to national regulations and standards, advocacy.
Investment Partners	<ul style="list-style-type: none"> <li>• NECTAR GROUP-UK</li> <li>• SLPMC</li> </ul>	Poultry and Abattoir investment promotion in Sierra Leone, funding opportunities.
Research and development partners	Schools of Environmental Sciences & Natural Resources Mgt and Quality Control , Njala University; Sierra Leone	Technology development, quality control and quality assurance

## CHAPTER ONE

### 1.0 INTRODUCTION:

Nectar Sierra Leone Bulk Terminal Development Company (NSBT) has its external interest in shipping and cargo facility operations. The company affiliates' with Nectar Group in the United Kingdom and other countries in Africa with classified settings of its competency for harboring and electro-mechanical service delivery on cargos and other needy areas. As Government of Sierra Leone (GoSL) emulate its development, through increase in growth pole at the national shipping and aviation businesses in the country Nectar Group, intercepted the idea in support with stakeholders within the SLPAC to help the facilitation of owning an operational space at the Queen Elizabeth II Quay. However, leveling increase of Government support to NSBT aim in the establishment of its services at the port operations came as a response to the aspiration of the Government of Sierra Leone (GOSL) agenda for prosperity framework and Food Safety and Security with a cascading effect on youth employment.

Current stands on NSBT operations based on direct and indirect concept as trapped by the previous research; explains the definitional terms of NSBT day-to-day activities at the Quay' therefore an idea on direct delivery services hanged on the coordination of NSBT management with shipping agencies and clients by providing storage of the goods with International Acceptable Standards(IAS). This process also goes in hand with line chain system, which allows NSBT service only after the clients should have gone through screening process on all shipping protocols and Sierra Leone Port Authority (SLPA) codes of conduct. On context, indirect delivery systems based on NSBT facility on warehousing of goods at the period of shipment or immediate hauling of the goods. As management of NSBT also, maintain its International Best Practices (IBP) on cross trading. With the bigger picture in mind by management, their hopes for the company to improve and increase more facilities for its workers within the perspective of technological drive that could help Sierra Leoneans trained on civil, electronics and mechanical services and other skills.

Albeit on management interest to sick for recognition with the Environmental Protection Agency Sierra Leone (EPA-SL) protocols and Act 2010. On environmental protection and community involvement, the management of NSBT considered the process in pursuance of its Environmental Impact Assessment (EIA) License through the hiring of an independent consortium led by Dr. ET Ndomina and associates, for an assessment project Environmental Social Health Impact Assessment (ESHIA). With much interest on management compliances, request for a review of the initial ESHIA necessitate through the following pointers, like the incorporation of vital indicators and real activities of NSBT in one document. These however, triggered management of NSBT to hire the service of Njala Environmental Technicians (NET) to carry a review exercise on the existing ESHIA through the leadership of Mr. Mohamed Dumbuya.

## 1.2 DESCRIPTION OF THE PROJECT

### 1.2.1 NSBT as a project

NSBT has been in existence for over two years, with the sole aim of promoting shipping and cargo services and delivery at the Queen Elizabeth II Quay. Management records on its inheritance to the occupied facilities and building infrastructure where almost tremendous as the entire buildings and space were refurbish in order to meet international recommendations with many mobilization of working machines. The project has its initial concession as shaped with other operating agencies and company such as Bollore, Dangotae-Cement and others. The company does not have much alternatives, so was open to facility sharing with other stakeholders within the Quay. Some building where assigned to NSBT that still been occupied by SLPA. The engineering dynamics of NSBT would range from handling of cargoes, packaging, and storing and consultant service.



Figure 3: With red indentation showing NSBT concession area and its immediate neighbours.

### 1.2.2 Nectar Group aligned project with NSBT

A proposal to augment the livelihood of NSBT in its operation at the Quay came into play by Nectar Group management to rearrange a level playing field for NSBT and SLPMC concession, as relevance to environmental safety management and comfort for an anticipation of more skill in mobilization and deployments. The concept of extension, to the additional plots within the same bearing and terrain would expect to achieve the following infrastructural uplift at the proposed extensional zone.

### **1.3 Engineering Processes on the way:**

Myriad of engineering activities would involve, the building of new conduit along the entire length of the warehouses approximately 300m in length with concrete formation of 18<sup>11</sup> deep and 24<sup>11</sup>width, into this conduit will have inlet drain every 15m from perforated 100mm drainage pipe that will take the sub surface water,. This will then drain into the main drainage network. NSBT staff would carry all of these services.

#### **1.3.1 What are the proposed future on the expansion facilities?**

##### **Phase One: Span (July 2017 to November 2017)**

- I. Site evaluation and planning for refurbishment
- II. Defected electrical installation and damages on existing building
- III. Complete repairs on existing building: That is; warehouses, sheds and floor work on buildings
- IV. Maintenance of cold store block with electrical servicing and testing for a reactivation on process using modern systems.

##### **Phase Two: Span (January 2018 to December 2018)**

- I. Cementation of Nectar Group vicinity and other damage areas
- II. Installation of weighing bridge
- III. Installation of lighting systems around the entire NSBT environs
- IV. Refurbishing of internal clinic for workers in NSBT and Nectar Group
- V. Over hauling of pipelines and retaliations of new ones within international standards

##### **Phase Three: Span (January 2019-December 2019)**

- I. Refurbishment of office blocks and facilities for canteen services
- II. Repairs and refurbishment of warehouse four (4) and other environmental parameters for safe housing i.e. Installations of Air Conditioner(AC) with other electronics fittings
- III. Inspection of buildings after several exercises from phase on and phase two respectively

##### **Phase Four: Span (January 2020 to 2020 in completion)**

- I. Demolition of old labour dock building in other to create wider view for workers
- II. Renovation of Suma Building
- III. Demolish cement shed for outside storage facility

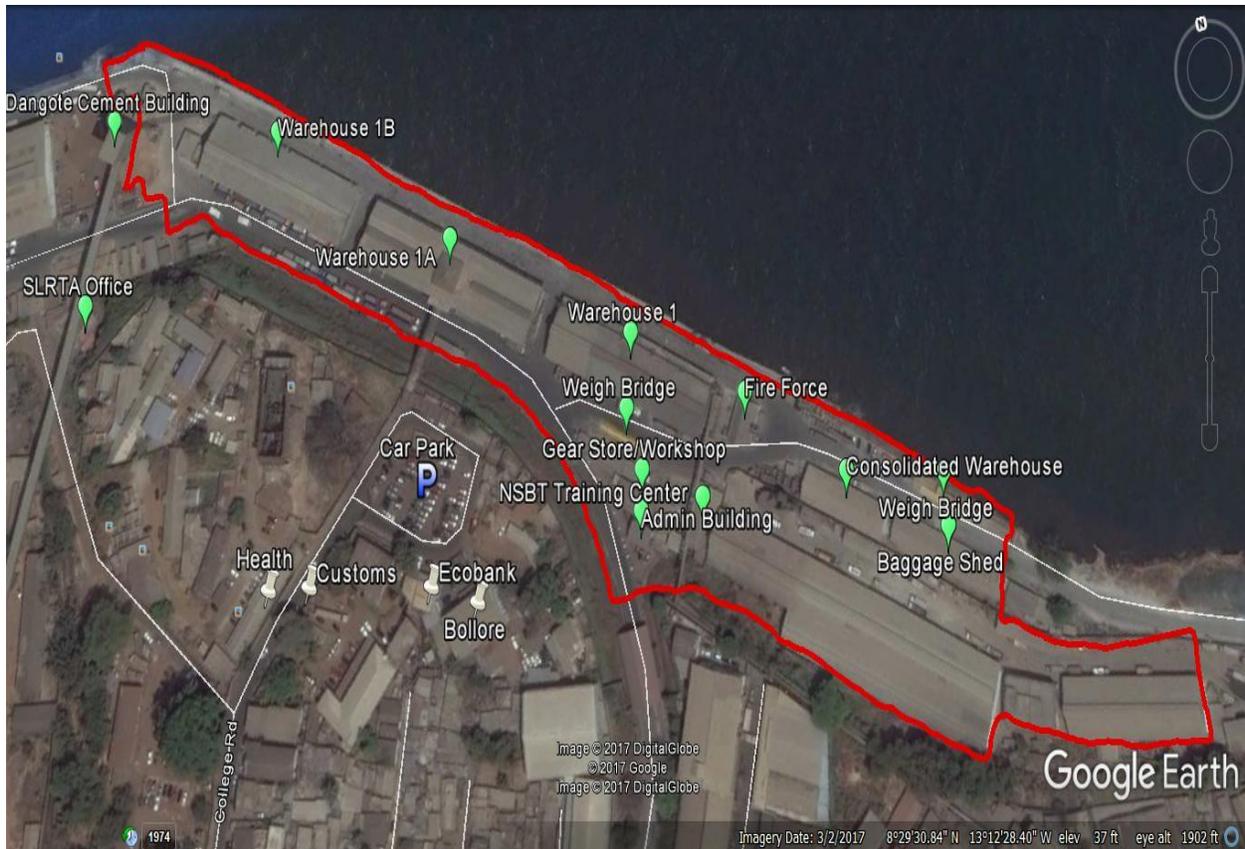


Figure 4: Shows boundary of the proposed extension of Nectar Group in service with NSBT

#### 1.4 Layout and port development by NSBT:

Nectar Group and NSBT in anticipation would create a complete hauling of the entire existing buildings within the area under lease by SLPA and SLPMC, with state of the art equipment and housing facility for the capturing of shipping and cargo businesses in the country. The conceptual framework of NSBT would maintain the historic shading plan of the port with environmentally accepted models as engineering approved for better access of customers and the prevention of accidental incidences.

NSBT as tenants of SLPA and SLPMC has attained total inclusiveness in all its facilities occupied, with great achievement to Human livelihood development, Sanitation and flood control together with cooperative safety management within its first year of recognition. In addition, there are hopes on the way in mobilizing modern technological systems for the benefit of non-train staff at the port. Within the start of the expansion work, much consideration would be follow; like working safety alert, waste management and employment management. All protocols on leasing process are in the annex page 4, and there is clear usage plan by SLPA and SLPMC and NSBT for any offset issues that could arise after the refurbishment of buildings.

The civil and mechanical work in anticipation are the construction of weighing bridge, electrical installations, mechanical assembles, and setting of standard workshop facilities for NSBT consultancy and operational interest.

## **1.5 NATURAL RESOURCES**

**Overview:** The environment occupied by NSBT services at the Port Authority terrain has set classifications of Air, Water and Land with variable interactions that probably can influence changes on the normal feeling of human as worker, animal as habitat and plant. All of these are classify as important under the environmental conservation laws and treaties. In context, Queen Elizabeth II Quay, has its existence far back in the history of Sierra Leone, and it was located by colonial masters and other great Sierra Leonean pioneers with several modification has been made for the suit of commerce and individualized managements. The earth is the only planet that is suitable for life in this universe. Life exists because of its interaction with the resources the earth provides. This interaction creates a balance between the living and the non- living resources and sustains both of them. The three most important non-living resources for us is the air we breathe, the water we drink and the land we live on. Without these three resources, we cannot exist. In this section, we will discuss the importance of air, water and soil for the sustenance of the living beings.

### **1.5.1 Air as a natural resources**

Air is a third critical resource for humans, plants, animals and all other organisms within a natural area. Monitor air in order to control and lower pollution levels, control smoke caused by wildland fires. Air is a mixture of gases that is composed of 78% Nitrogen, 21% Oxygen and a very small percentage of water vapour and other gases. The fact that air contains so much oxygen is not because the earth provided us the atmosphere with that composition, but because living things like plants produced oxygen for over 2 billion of years from carbon dioxide. The oxygen in air is essential for animals to survive because we use this oxygen to produce energy from the food we eat. The carbon dioxide we breathe out is in turn required for plants to trap energy from the sun and turn it into food. The air also has another important function: it regulates the temperature of the earth and causes weather to occur. Without the atmosphere's moderating effect, the earth would fried during the day and would be freezing cold in the night. The movements of air (wind) bring us rain every monsoon. Polluting the air by releasing hazardous chemicals can thus threaten the existence of life and can alter climatic patterns.

### **1.5.2 Water as a natural resources**

Water is one of the most important natural resources flowing from forests.

### **1.5.3 Land as a natural resources**

Provides nutrients, water, oxygen and heat to natural land areas. Understanding the ability and capacity of soil to support an ecosystem plays an important role in land management decisions.

The minerals useful for life found in the upper crust of the earth. Nevertheless, most of these are on rocks, which cannot used, by plants or animal. Instead, we need them crushed in small particles, which we call soil. The breaking up of rocks forms soil by various geological, climatic and

biological processes. Soil contains minerals such as Iron, Zinc, Nitrogen compounds, etc. that are all essential to sustain life. It also holds water and makes it available for plants to use. Soil also contains ores from which we can extract metals such as iron, copper, gold and aluminum.

## **1.6 STRATEGIC ENVIRONMENTAL RESOURCE AND DYNAMICS**

### **1.6.1 Tides**

At the northern mouth of the estuary, sand bars of considerable magnitude obstruct the flow of water from and into the estuary and consequently the velocity of the tidal stream are very great. In the dry season, during spring tides, the flood stream runs from 1 to 1.5 knots lasting for about 5 hours, and the stream on the ebb tide varies from 2 to 2.5 knots for about 7 hours. In the wet season, however, when the tidal prism augmented by the flood discharge from the river, the ebb stream attains velocities in the region of 5 knots. The tide brings in fair quantities of silt from the upper reaches of the estuary. The Highest Astronomical Tide or maximum tidal range goes up to 3.38 metres above the lowest Astronomical Tide or the Admiralty Chart Datum.

Mean High Water Neaps or MHWN are 2.30 meters above Chart Datum whereas Mean Low Water Neaps or MLWN are 1.0 meter above Chart Datum.

### **1.6.2 Wind**

The two principal winds are the northeast trades and the southwest trades. The northeast trills prevailing winds during the dry months (December to April), whereas the latter during the rainy season (May to November). The northeast trades blowing over the coast known as the Maritime Trades and are relatively cool and humid. The southwest trades are the Southeast Trades from the southern hemisphere, deflected at right angles as they cross the Equator. Near the coast land breezes, affect the prevailing seasonal winds. The most frequent wind directions are from northwest and southwest with speeds ranging from 4 to 12 knots.

### **1.6.3 Waves and swells**

Almost a perennial swell of moderate height coming in from the Atlantic disturbs ships at their moorings within the estuary. This phenomenon is particularly evident during the wet season when both frequency and amplitude are greatest. The maximum amplitude is in the region of 1.0 meter.

Wind waves, usually not higher than 1.0 meter, only occur for brief spells usually just before the change of seasons about May and October.

Within Cline Bay, waters are relatively calm and the wave height generally less than 0.50 meters. However, higher waves occur very briefly during season changes (March-April & September-October).

Although no actual wave records for Cline Bay exist, personal opinions of those familiar with the area suggest maximum wave heights in the region of 1.20 to 1.80 meters. However, an approximate idea of the significant wave heights at Cline Bay given in the table below.

Direction	Fetch Length	Average Depth	Maximum Wind Speed	Wave Length	Significant Wave Height
	M	M	Mph	M	m
<b>Northwest</b>	6700	11	30	11,50	1.2
<b>North</b>	6100	7	30	10.40	1.1
<b>Northeast</b>	5800	11	30	9.80	1.1
<b>East</b>	7600	9	30	11.50	1.2

Although this location is not free from swells that enter the estuary, the combined effects of refraction and diffraction due to the shallow contours at the approaches to the bay will moderate their energy so that they will be less intense than observed closer to the entrance of the estuary.

#### 1.6.4 Topography and Seabed contour

Kissy bay is a flat cove within the larger Cline Bay, which stretches from Cline Point all the way to Ardon Point.

The area behind the cove rises from a gently undulating terrain to the West to a gentle cliff towards the East. A small oil refinery and tank farm situated on the top of the cliff. The area behind the cove is sparsely built-up.

The area at the root of the cliff shows a marked accumulation of sand. The depth of the water in the cove is very shallow, deepening out along the cliff towards its end. There is a light littoral drift in a predominantly easterly direction.

#### 1.6.5 Hydro-morphology

The Rokel River is the longest river in Sierra Leone (290km). The Estuary is about 259km<sup>2</sup> in area and at its widest point (mouth) before it empties into the Eastern Atlantic is 11km. The deepest channel (33m) occurs in the south at the lowest reaches at Cline Bay. This deep channel runs as far as Pepel. Elsewhere at the side and the upper reaches, the estuary hardly exceeds 10m depth (Watts, 1957; 1958; Longhurst, 1958; Leigh 1973; Findlay, 1978; Tucker 1984; COMARAF, 1990). The tidal amplitude at Freetown ranges from 0.9m at lowest neaps to 3.0m at highest springs, with a mean of about 1.9m. Tidal currents are appreciably strong with the streams on the floods at spring running from 1 – 1.5 knots (2-3km/hr) and on the ebb from 2 – 2.5km

(4-5km/hr) while at neaps the stream on the flood runs at about 0.5-1km/hr and on the ebb at about 1km (2.5km/hr). During the wet season, the streams on the ebb can reach up to 5km (10km/hr). The duration of the flood stream is about 5 hours while the ebb stream is about 7 hours.

The Sierra Leone River Estuary vertically and horizontally stratified with gradients influenced and modified by both the tidal ranges and river discharges. The stratification became intensified in the rainy season. The surface salinity may drop along the main channel of the estuary to about 8‰ at Pepel and 16‰ at the head of the Bunce River (COMARAF, 1990). In the estuary, the surface salinity range is from 15‰ to 33‰ at springs and 19‰ to 35‰ at neaps. At the surface during the dry season at low water, salinity ranges from 22.6‰ at Pepel to 33.3‰ at Cape Sierra. Oxygen values ranged from 66-83% in the upper reaches, 55-90% in the middle reaches and 55-90% outside the mouth of the estuary (Leigh, 1973; Findlay, 1978). Surface water temperature varies from 26.0°C to 28°C whilst pH values range from 6.5 to 8.6. Dissolved phosphate content at the upper reaches, middle reaches and the mouth were 0.15 µg-at P/L, 0.3 - 0.97µg-at P/L and 0.25 – 0.72 µg-at P/L (Baimbridge, 1960). Leigh (1973) found inorganic phosphate concentration ranges of 0.10 to 0.76 µg-at P/L at the mouth and middle reaches respectively.

The average phosphorus concentrations for the surface and bottom waters found to be 0.39 µg-at/l and 0.45 µg-at/l in 1980 (IMBO, 1980).

The Nitrate-nitrogen values for the upper reaches, middle reaches and the mouth combined of the estuary as determined by Watts (1958) were 10.13µg-at N/L and 5.29µg-at N/L respectively. Leigh (1973) found that the range of nitrogen concentrations was 0.1µg-at N/L in the dry season and 66.6 µg-at N/L in the rainy season.

IMBO (1980) determined the average nitrate-nitrogen concentrations of the surface and bottom waters in the middle reaches to be 0.42mg/l and 0.45mg/l respectively.

The bottom deposits of the estuary is from sand or shelly sand from outside the mouth through mud in the middle reaches to coarse and in the upper reaches (Watts, 1957; Longhurst, 1958; Strasser-King, 1979; Turner 1984; COMARAF, 1990). The black muds of the middle reaches of the estuary have a relatively high organic content (Turner, 1984). In some places as high as 1.38mg C/g sediment (Cape Sierra) and in others as low as 0.033mg C/g sediment (mouth)

## 1.6.6 Fauna

### Plankton

The plankton of the Sierra Leone river estuary and parts of its creeks and bays have been studied by many researchers including (Watts, 1958; Bainbridge, 1960; Aleem, 1973; Leigh, 1973; Findlay, 1978; COMARAF, 1990; Conteh, 2001).

Horizontal distribution and seasonal fluctuations in plankton production are intricately link with the changes in climate during the rainy and dry seasons. During the rainy season (May-September), there is a reduction in solar insolation, increased discharge of freshwater, increase in dissolved and suspended solid deposition on the shelf and the lowering of the temperature. During this period, there is instability. Stability returns in November after a complete mixing of the estuarine water in October by strong winds. In the dry season (November-April) there is a reduction in river discharges, reduction in stream velocity, increase in wave and tidal effects, and increase in solar radiation and temperature leading to stratification.

Phytoplankton production increases in December followed by an increase in numbers of zooplankton in January and February. There is rapid reduction in nutrients due to corresponding uptake by phytoplankton and loss from surface waters due to dying plankton sinking to the bottom. There is a gradual increase in salinity due to the intrusion of oceanic waters and high evaporation rate reaching a maximum in May or June. Cold oceanic water intrusion during the prevailing harmattan depresses temperature at optimum salinities, thus favoring high standing stocks of plankton during the middle of the dry season at the middle reaches (Leigh, 1973). Seawater temperature reaches a second peak in April and May during which period plankton production decreases.

In general high plankton production is between the ends of the rainy season to the middle of the dry season (October-February). There is a decline from March to June, which extends into the rainy season. The major phytoplankton species are *Thalassiosira*, *Nitzschia*, *Pleurosigma*, *Coscinodiscus*, *Thalassionema*, *Skeletonema*, *Amphora*, *Ceratium*, *Peridinium*, *Senedesmus* and *Oscillatoria*. Some blue green algae may occur in the rainy season.

Dominant phytoplankton species in the dry season appears to be *Coscinodiscus*, and *Thalassiothrix*. In the rainy season, the dominant species are *Thalassiothrix*, *Coscinodiscus* and *Thalassiosira*. Average primary production levels of 100 – 150g C/m<sup>2</sup>/yr been recorded.

The following major categories of zooplankton have been noted for the Sierra Leone River Estuary: Copepoda (*Temora turbinata*, *Centropages furcatus*, *Schmackeria serricaudatus*; *Cladocera*, *Evadne tergestina*, *Penilia avirostrius*) Mysiidacea; *Brachyuran larvae*; *Brachyuran megalopa*, *Amphipoda* Hyperiididae, Gammaridae; Decapoda (*Lucifer faxoni*); Chaetognatha (*Sagitta enflata*; *S. friderici*); Appendicularia; Thalacea; Polychaeta (Leigh, 1973; Findlay, 1978).

There is also minor representative of other benthic larvae (Mollusca, Echinoderms and fish larvae (Yillia, 1995 unpublished).

The Copepoda are the dominant category (40%-70%). Total zooplankton volumes varied from 1278 individuals /m<sup>3</sup> in dry season (February) to 540 individuals /m<sup>3</sup> in the rainy season (September).

**List of dominant benthic fauna found in estuaries of Sierra Leone.**

POLYCHAETA	<i>Rhophipholis cincta</i>	CRUSTACEA
<i>Clymene monilus</i>	<i>Ophiuroidea sp.</i>	<i>Squilla africana</i>
<i>Glycera convulata</i>	<i>Astropecten michelseni</i>	<i>Callianassa balssi</i>
<i>Diopatia neapolitanea</i>	MOLLUSCA	<i>Alpheus pontederiae</i>
<i>Pectinaria sourei</i>	<i>Ihiphegenia truncate</i>	<i>Penaeus notialis</i>
<i>Lumbrinereis impatieas</i>	<i>Tellina nymphlis</i>	<i>Parapenaeus atlantica</i>
<i>Goniada multidentata</i>	<i>Donax owe</i>	<i>Lyosquilla septemspinosa</i>
<i>Terribellid sp</i>	<i>Mactra specia</i>	<i>Upogebia furcata</i>
GEPHYREA (SIPUNCULIDAE)	<i>Glycimenis</i>	<i>Latreutes parvulus</i>
<i>Ochetostoma Mercator</i>	<i>Aloidis dauzenbergi</i>	<i>Polyonyx sp.</i>
<i>Sipanculus titubens</i>	<i>Surcula coerulea</i>	<i>Diogenes pugilator</i>
BRANCHIOPODA	<i>Pachymelana aurita</i>	<i>Pagurists manretanicus</i>
<i>Ligula parva</i>	<i>Neritina oweniana</i>	<i>Uca tangeri</i>
ECHINODERMATA	<i>Neritina rubricate</i>	<i>Heteropanope caparti</i>
<i>Rotula orbicularis</i>	<i>Neritina glabrata</i>	<i>Menippe nodifrons</i>
<i>Holothurian sp.</i>	<i>Aloidis trigona</i>	<i>Porcellanna longicornis</i>
<i>Amphioplus congensis</i>	CEPHALOCHORDATA	<i>Clibenarius cooki</i>
<i>Acrocrida semisquamata</i>	<i>Brachiostoma leoense</i>	

## 1.7 CARGO HANDLING EQUIPMENTS.

**Table 2. List of NSBT machines and information**

Equipment	Brand	Quantity	Function	CHASIS NO	Fuel
	DENNIS SABRE FIRE TRUCK	1	Firefighting	SFD322M12TG56 0586	Diesel
	TEREX TFC45 STACKER	1	Lifting Containers	TFC45177685	Diesel
	DOOSAN D25G FORKLIFT	1	Lifts/Moves material within a short distance	A377682	Diesel
	JCB TELEHAND LER MACHINE	1	Lifts/Moves material within a short distance with a boom that can extend	JCB5ABJGJ711963 7	Diesel
	TEREX 820 B/LOADER	1	Used for carrying grains/seedlings	SMFH44SCOFAH M3780	Diesel
	CATERPILL AR 50 F/LIFT	1	Moves material within a short distance	ET28B51028	Diesel

	<b>IVECO EUROCAR GO SWEEPERT RUCK</b>	<b>1</b>	<b>Road sweeping and water storage</b>	<b>ZCFA75B0302502 295</b>	<b>Diesel</b>
	<b>TVS ZT125 Bikes</b>	<b>1</b>	<b>Courier</b>	<b>MKZ53N1H6GJ00 5902</b>	<b>Diesel</b>
	<b>BOB CAT S175</b>	<b>1</b>	<b>carrying grains</b>	<b>A8M411155</b>	<b>Diesel</b>
	<b>BOB CAT S130</b>	<b>1</b>	<b>carrying grains</b>	<b>A8KA60417</b>	<b>Diesel</b>
	<b>Generator 01</b>	<b>1</b>	<b>Electricity Generation</b>	<b>100 KVA</b>	<b>Diesel</b>
	<b>Generator 02</b>	<b>1</b>	<b>Electricity Generation</b>	<b>30 KVA</b>	<b>Diesel</b>
	<b>Fuel Proof(bow ser)</b>	<b>1</b>	<b>Fuel(Diesel) Storage</b>	<b>20949</b>	<b>Petrol</b>

	<b>Land Plants</b>	<b>4</b>	<b>Movable electricity Generators</b>	<b>12KVA &amp; 15 KVA</b>	<b>Diesel</b>
---	--------------------	----------	---------------------------------------	---------------------------	---------------

### **1.7.1 Description of Activities and ancillary operation**

#### **NSBT services on cargo facilities**

NSBT facilitation on Cargoes before delivery. Bagging machines (Compac M140) made of stainless steel is use for bagging in order to avoid contamination of food grains.

#### **NSBT services on weighing facilities**

NSBT currently using two weighbridges at the inception stage, but with demand to its quality services rendered, additional weighbridge construction of two more, in order to facilitate the service of import and export processes for accurate recording of volumes.

#### **NSBT storage facilities**

Accessibility of warehousing facilities for imported and export consignment within the standard shelving and handling process for increasing business interest provided by NSBT management.

#### **NSBT Mobile Bagging Facilities**

This aspect works with electro-mechanical process that calibrated on different scales in Kilograms (Kg), for an acceptable view by consumer and facility provider and other commentators or stakeholders in process.

## CHAPTER TWO

### 2.0 DESCRIPTION OF LEGAL, REGULATORY AND ADMINISTRATIVE FRAMEWORKS FOR THE ENVIRONMENT

Legislation and Governance on environmental Management relating to the NSBT Company operations are to be in the following:

- Ministry of Lands Country Planning and the Environment; (MLCPE)
- Lands Policy;
- Environment Protection Agency Act (2008 as amended 2010);
- Factories Act – 1974;
- Fisheries Regulations and Development;
- Local Government; and
- International Conventions.
- Organizational Structure of Environmental Management at National and Local levels

#### 2.1 Ministry of Lands, Housing, Country Planning and the Environment (MLHCPE)

There is an overall institutional and legal framework for the management and protection of our environment in the national context. The responsibility for the management and protection of the environment formerly lay with the Department of the Environment of the Ministry of Lands, Housing, Country Planning and the Environment. The political head of the Department of the Environment was the Minister of Lands, Housing, Country Planning and the Environment.

The Administrative head was the Permanent Secretary who was responsible for coordinating the function of the departments within the Ministry viz. department of Land and Country Planning (DLCP), Department of surveys and Lands (DSL) and the Department of the Environment, (DOE). He was also the Principal Adviser to the Minister and the vote controller of the Ministry's budget.

The Forestry Division reverted to MAFFS. The EPA now called EPA-SL (Environment Protection Agency Sierra Leone) and it now functions under the office of the President.

#### 2.2 Department of the Environment

The then Department of the Environment (DOE) had in 1995 developed with World Bank Support, the National Environmental Action Plan (NEAP) the NEAP is now under review. This plan presented in two volumes. Volume 1 analyses the environmental issues in Sierra Leone and the recommends interventions. Volume 2 contains the environmental proposals. A National Environmental Policy (NEP) has been prepared in 1994. The goals, objectives and strategies of the (NEP) are outline below:

## **Policy Goals**

The goal of the National Environmental Policy is to achieve sustainable development in Sierra Leone through sound environmental management.

## **Objectives**

- To secure all Sierra Leoneans of a quality environment adequate for their health and wellbeing;
- To conserve and use the environmental and natural resources for the benefit of present and future generations;
- To restore, maintain and enhance the ecosystems and ecological processes essential for the functioning of the biosphere; to preserve biological diversity and the principle of optimum sustainable yield in the use of living natural resources and ecosystems; and
- To raise public awareness and promote understanding of the essential linkages between environment development and to encourage individual and community participation in environmental improvement efforts.

## **Strategies**

The following strategies were pursued in order to achieve the policy goals and objectives.

- (a) To establish and/or strengthen environmental protection standards, monitor changes in, and publish relevant data on, environmental quality and resource use;
- (b) To make prior environmental impact assessment (EIA) of proposed activities which may significantly affect the environment or use of a natural resource and to provide relevant information, in a timely manner, to persons likely to be significantly affected by a planned activity and to grant them equal access and due process in administrative and judicial proceedings; and
- (c) To promote environmental management through the creation of administrative and infrastructural support with appropriate financial backing;
- (d) To cooperate in good faith with other countries and agencies to achieve optimal use of Trans boundary natural resources and effective prevention or abatement of Trans boundary environmental protection.

The legal basis for the implementation of the NEAP and for environmental Management and protection in Sierra Leone was the National Environmental Protection Act, 2000.

### **2.3 The National Environmental Protection Act (NEPA)**

The National Environmental Protection Act (NEPA) 2000 empowered the then Department of the environment to perform the following tasks amongst others:

- Screen projects for Environmental Impact Assessment (EIA);
- Issue environmental Impact Assessment Licenses; and
- Formulate or promote the formulation of, and monitor the implementation of environmental policies, programs, projects, standards and regulations.

The Environment Protection Agency Act (EPAA) of 2008 gives the new Environmental Protection Agency (EPA) similar powers as NaCEF.

### **2.4 National Environment Protection Board (NEPB)**

The NEPA 2000 also provided for the establishment of an environmental protection Board. This Board, which was set up, had the following functions:

- (a) Facilitates coordination, cooperation and collaboration among government ministries, local authorities and other agencies in areas of environmental protection;
- (b) Review national and sectoral policies and make such recommendations or proposal it may think necessary to the Minister.
- (c) Review environmental impact assessments prepared pursuant to this Act and make appropriate recommendations to the Director.
- (d) Investigate or cause to be investigated, any activity, occurrence or transaction which it considers is likely to have or result in harmful consequences to the environment and advise on measures necessary to prevent or minimize such consequences;
- (e) Advise the Minister on areas of environmental protection and control requiring special or additional measures indicating the priorities and specific goals to be achieved;
- (f) Undertake or cause to be undertaken specific studies and research aimed at developing strategies for the protection of the environment and make appropriate recommendations to the Minister; and
- (g) Consider any other matters, which the Minister may refer to it and make appropriate recommendations or proposal thereon.

## **2.5 The Environment Protection Agency (EPA) now Environment Protection Agency -Sierra Leone (EPA-SL)**

The EPA-SL has set by an Act of Parliament (The Environment Protection Agency Act EPAA 2008). This Agency now functions under the office of the President by an amendment in 2010.

Under the EPAA (2008), the EPA-SL has wide-ranging functions and powers including:

- Formulation of policies on all aspects of the environment;
- Co-ordination of activities of bodies and agencies that impact the environment;
- Prescription of environmental standards and Guidelines;
- Issuance of environmental permits;
- Enforcement of compliance; and
- Studies and Research.

Unlike the EPAA, the Sierra Leone Environment Protection Agency Board (SLEPAB) carries largely oversight and supervisory functions. Like NEPB, the SLEPAB composition is largely statutory with inclusion of many line ministries and units whose activities influences the environment. The Ministry of Finance and Economic Planning is conspicuously absent.

An Executive Director and Three (3) Deputy Executive Directors in charge of head the EPA-SL:-

- Field operations and extension;
- Planning, Policy and Research; and
- Finance and administration.

The proposed and new establishment in EPA, which have been include:

- Chemical Control and Management-(New)
- Information, Education and Communication-(New)
- Environmental compliance and Enforcement-(New)
- Inter-sectoral and International Cooperation;
- Finance Department

- Administration

The Provincial and District Environmental Officers are yet to be appointed. Now, EPA-SL is under-resourced with constraints to skilled staff that should promulgate its mandate.

### **Local Level**

- I. At the local level, the environmental Sanitation functions are carried out by provincial officers of the DOE (formerly under NaCEF but now under the EPA-SL) of the then MLHCPE through its Assistant Environmental officers in the Northern, Southern, Eastern Provinces and an officer for the Western Area.
- II. Presently tasks of the Assistant Environmental officers operating at provincial levels include monitoring of environmental programmes, evaluation of environmental degradation and completion of reports.
- III. The EPA office also encapsulated the country City and Town Councils Act on urban planning, Environmental Planning, Monitoring and Evaluation has been in co-partnered.
- IV. City and Town Councils charged partly with the responsibility of Environmental Management and Sanitation. Council employees attach assistant Environmental Health Officers to the councils to offer professional advice and training on the cleaning and physical removal of garbage and disposal.

### **2.6 EIA Procedure and Guidelines**

Litigation on environmental procedures came into interest through DOE in July 1999. The documents unscripted as EIA guideline documents for Environmental Impact Assessment. The documents highlighted; objectives and gave outlines on procedures for an Environmental Impact Assessment with guidelines that could support proponents should she/he wants to carry out environmental assessments. The EIA processes will include the following:

- I. Integration of environmental considerations in development planning processes, in order to make use of natural resources in a responsible manner; and
- II. Protection and enhancement of the quality of all life forms;

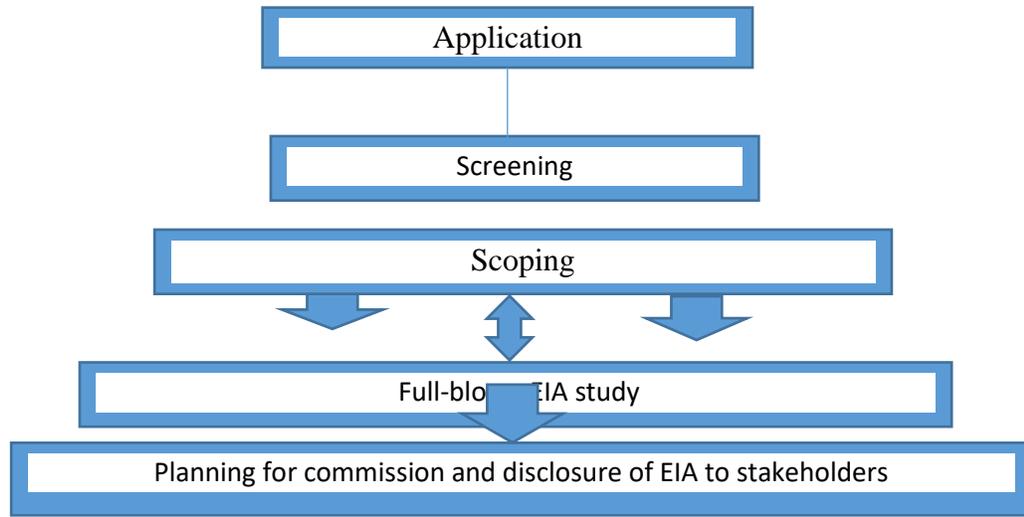
### **2.7 Responsibilities in Dealing with EIAs – Competent Agency**

The current guidelines define the competent Agency as the agency that will have to take responsibility for the EPA-SL process, including the review of the initial proposal, of the reports and of the final decision on the acceptability of the submitted EIA.

It affirms the EPA as the competent authority at the National level in Sierra Leone and the role, in the long term, of regional environmental offices when they established, in dealing with EIAs at the national level.

## 2.8 EIA Processes and Procedures

The processes and procedures described below has incorporated into the new EPAA (2008) and much of its rules used in EPA Act 2010.



### Screening

In case of Category 'B' projects or activities, this stage will entail the scrutiny of an application seeking prior environmental clearance made in Form 1 by the concerned stakeholders for determining whether or not the project or activity requires further environmental studies for preparation of an Environmental Impact Assessment (EIA) for its appraisal prior to the grant of environmental clearance depending upon the nature and location specificity of the project. The projects requires' an Environmental Impact Assessment report, shall be termed Category B1 and will not require an Environmental Impact Assessment report. These entails the following:

- I. Identification all expertise, resources and plans for the possible abatements and pre-sustainable environmental plans by client
- II. Identify all Government Authorities and agencies to be responsible
- III. Allow a share of views by clients on anticipated financial dealings by project upon successful.
- IV. The public participation process;

At the end, the consulting firm or team should submit either behalf or behalf of the proponent to EPA as the competent agency for environmental evaluation of project.

## Scoping

Scoping' refers to the process by which the SEA of proposed project that class as Category B1 for instance, such projects or activities including applications for expansion and/or modernization and/or change in product mix of existing projects or activities can be determine detailed and comprehensive. Use TOR in addressing all relevant environmental concerns and issues for the preparation of an EIA report in respect of the project or activity for which prior environmental clearance is meet. The scoping process would ensure that the EIA focuses on the right issues.

## EIA and EIS

The guideline provides a template structure for the EIA report (or EIS Environmental Impact Statement), as follows:

- Executive Summary
- Project Description
- Description of the Environment
- Description of Project Impacts
- Description of Alternatives Considered
- Assessment of the legal implications of the impacts
- Description of Expected Benefits of the Project
- Description of Methodology
- Evaluation of Impacts
- Mitigating Measures
- Identification of Information Gaps
- Other:
- List of Participants
- List of References.

### 2.8.1 Categorization of Projects

The NEPA 2000 and the EPAA (2008) schedule categorize projects into three “schedules” according to their potential impacts:

- Schedule I includes “projects requiring Environmental Impact Assessment License”.
- Schedule 2 outlines factors for determining whether a project requires an Environmental Impact Assessment
- Schedule 3 outlines contents of Environmental Impact Assessment (EIA)

The project categorization as given in NEPA 2000 has retained and incorporated into the EPAA (2008).

The National Environmental Protection Board (NEPB) has been screening projects. A new Board, Environment Protection Agency- Sierra Leone Board (EPA-SLB), has replaced the NEPB. The

NEPB as pointed out was under-funded and understaffed and could not fully carry out the roles assigned to it under the EA. The new board may suffer similar fate unless there is increased support from GOSL and other donor agencies. This support will take the form of training some of their staff and recruiting service providers to assist them to carry out their roles of reviewing and clearing sub-projects and of monitoring. Those service providers should be hire by EPA-SL as and when required. Under the EPAA – 2008 the EIA Processes and Procedures including Project categorization remain the same as outlined above. Only the nomenclature has altered.

## **2.9 The Factories Act – 1974**

This Act became effective on 30 May 1974. It deals with health and safety measures as they concern the factory worker. It protects the worker through demands for all aspects of cleanliness, reports of all injuries, accidents, diseases and death.

A Factories Appeal Board is in operation and has the duty of hearing and determining any appeal submitted by factory owners, thus giving right where it is due. The necessary environment conditions of the Act are therefore stated or highlighted below.

### **2.9.1 Powers of Inspectors**

Section 14 of part IV of this Act states that an inspector shall execute this Act, since they have the power to do the following:

- To enter, inspect and examine a factory and its environs at any time, as long as he has reasonable cause to believe that explosives or any highly inflammable materials are stored or used;
- To take with him during an inspection, a police officer, if he has reasonable cause to expect any serious obstruction during the execution of his duty;
- To require the production of all documents and to examine and copy them in pursuance of this Act;
- To make necessary inquires and examinations to ascertain whether the provisions of the Act are complied with; and
- To prohibit the use of any machinery, if he is reasonably of the opinion after examination, that it is not in good and safe condition.

If anyone willfully delays or obstructs the Inspector in the exercise of any of his duties under this Act, then such a person shall be guilty of an offence and be liable to a fine not exceeding twenty Leones or to imprisonment for a term not exceeding one month or both. The occupier of the

factory shall also be guilty of such an offence and be liable to punishment in like manner, even though he has not personally caused the obstruction.

### **2.9.2 Rules for the Implementation of the Act**

As stated in section 16, the Minister may make rules for the effective implementation of this Act and such rules may provide:

- For the safety of persons employed in such trades and occupations as may be declared to be dangerous trades;
- For imposing obligations for the better safeguarding of persons against accidents from dangerous parts of any machinery;
- For the construction and maintenance of fencing to the dangerous parts of any machinery;
- For the proper maintenance and safe-working of raising and lowering machinery;
- For prescribing the duties of inspectors appointed for the purpose of this Act;
- For prescribing the qualifications to be possessed by engineers and other persons, for them to be placed in charge of, or entrusted with the care or management of any specified machinery;
- For the reporting of any occurrences at any works arising from, or in connection with, the use, maintenance or repair of any machinery;
- For the appointment of persons to hold enquiries under this Act, and prescribing powers and duties of such persons; and
- For the fixing of penalties not exceeding a fine of one hundred Leones or imprisonment for a term of six months or both such fine and imprisonment, for the contravention of any rule.

### **2.10 Safety, Security and Welfare of Employees**

Part V of this Act, deals with the aspect of health, stipulates that every factory shall be in a clean state, and free from effluent arising from any drain, sanitary convenience or nuisance. This part of the Act' also states that for overall safety of all employees, the factory must not be overcrowded, must be effectively ventilated, and provided with suitable lighting systems. The factory holder must take every care, to secure the health, safety and welfare of all employees.

As indicated in section 38, it is incumbent on the company to notify the District Inspector, in writing, of any accident or death in the factory. As by, points in section, 39', that all factory-

contracted diseases identified by a medical Practitioner, must be brought to the notice of the Chief Inspector in Freetown.

Section 40 states: Where injury immediately results in death, the site of the accident must left undisturbed after the removal of the corpse, until inspected by a police officer or an inspector.

On receipt of the report of an accident, the inspector shall consider it necessary or if directed by a higher authority immediately proceed to the scene of the accident, as indicated in section 41, and shall make enquiry into the cause of the death. This section further states that for the purpose of this enquiry, the inspector is free to use one under oath, any document, and award fees for giving evidences, as may be fixed by the minister.

Any person who, without reasonable cause fails to comply with the terms summons for inspector, or refuses to be examined or answer to questions other than that which may incriminate him, or anyone who obstructs an Inspector or any person acting under his directions in the execution of his duty under section 41, shall be guilty of an offence.

The owner of every factory, according to section 45, must within 24 hours report in writing to an Inspector every dangerous occurrence caused by any machinery or electrical abnormality. Section 26 of part VI stipulates that there shall be kept posted in a prominent position in every factory:

- The prescribed abstract of this Act;
- The address of the Chief Inspector and of the nearest Inspector; and
- Printed copies of any regulations made under any part of this Act which are for the time being in force in the factory, or the prescribed abstracts of such regulations.

## **2.11 Offences and Penalties**

Part VIII of this Act deals with offences, penalties and legal proceedings. Section 47, subsection 1 of this part, states that in the event of any contravention of the provisions of this Act or of any Regulation or Order made there under, the occupier or owner of the factory, shall, be guilty of offence under the Act.

Regarding offences for which there are no penalties provided, section 48 stipulates that, any person guilty of an offence under this Act for which no express penalty is provided by or under the Act, shall be liable to a fine not exceeding fifty Leones or to imprisonment for a term not exceeding one month or both. If the contravention for which he/she convicted continues, he shall be guilty of a further offence and liable to a fine not exceeding ten Leones for each day on which the contravention is continued. Section 50', states that if anyone is kill, or dies, or suffers any bodily injury, in consequence of the occupier or owner of a factory having contravened any provision of this Act. The occupier or owner of the factory, shall without prejudice to any other penalty, be

liable to a fine not exceeding two hundred Leones or to imprisonment for a term not exceeding three months, or to both.

All offences committed under this Act shall, section 56 states, be prosecuted in a magistrate court.

## 2.12 World Bank Requirements

Appropriate IFC/World Bank policies and guidelines include:

- Indigenous peoples (OD 4.20 or PS7) – addresses the traditional rights of people including land and water rights and ensures that indigenous people benefit from development projects;
- Induced development and other socio-cultural aspects;
- Occupational health and safety guidelines;
- Social and Environmental assessment (OP 4.01 or PS 1) – policy and procedures for environmental assessments whereby potential impacts are taken into account in selecting, siting, planning and designing projects;
- Designed to ensure that IFC projects are environmentally and socially sound and sustainable; and
- Water Resources Management (OD 4.07) – policy to promote economically viable, environmentally sustainable and socially equitable water management.

## 2.13 World Bank Environmental, Health and Safety Guidelines

### Ambient Air

Concentrations of contaminants, measured outside the project property boundary, should not exceed the following limits:

Particulate Matter (<10 microg)

Annual Arithmetic Mean	100 microg/rn <sup>3</sup>
Maximum 24-hour Average	500 microg/rn <sup>3</sup>
Nitrogen Oxides, as NO <sub>2</sub>	
Annual Arithmetic Mean	100 microg/rn <sup>3</sup>
Maximum 24-hour Average	200 microg/rn <sup>3</sup>
Sulphur Dioxide	
Annual Arithmetic Mean	100 microg/rn <sup>3</sup>
Maximum 24-hour Average	500 microg/rn <sup>3</sup>

### Workplace Noise

- Feasible administrative and engineering controls, including sound-insulated equipment and control rooms should be employed to reduce the average noise level in normal work areas;
- Plant equipment should be well maintained to minimize noise levels; and
- Personnel must use hearing protection when exposed to noise levels above 85 dB.

## **Work in Confined Places**

- Prior to entry and occupancy, all confined spaces (e.g. tanks, dumps, vessels, sewers, excavations) must be tested for the presence of toxic, flammable and explosive gases or vapours, and for lack of oxygen;
- Adequate ventilation must be provided before entry and during occupancy of these spaces;
- Personnel must use air-supplied respirators when working in confined spaces which may become contaminated or deficient in oxygen during the period of occupancy; and
- Observers/assistants must be stationed outside or confirmed spaces to provide emergency assistance, if necessary, to personnel working inside these areas.

## **Health General**

- Sanitary facilities should be well equipped with supplies (e.g. protective creams) and employees should be encouraged to wash frequently, particularly those exposed to dust, chemicals or pathogens;
- Ventilation systems should be provided to control work area temperatures and humidity;
- Personnel required to work in areas of high temperature and/or high humidity should be allowed to take frequent breaks away from these areas; and
- Pre-employment and periodic medical examinations should be conducted for all personnel, and specific surveillance programs instituted for personnel potentially exposed to toxic or radioactive substances.

## **Safety General**

- Conveyors and similar machinery should be provided with a means for stopping them at any point;
- Shield guards or guard railings should be installed at all belts, pulleys, gears and other moving parts;
- Elevated platforms, walkways, stairways and ramps should be equipped with handrails, toe boards and non-slip surface;
- Electrical equipment should be grounded, well insulated and conform to applicable codes;
- Employees should be provided with hard hats, safety boots, eye and ear protection aid, and snug fitting gloves as appropriate;
- Masks and dust-proof clothing should be provided to personnel working in areas with high dust levels;
- Procedures must be strictly enforced for the storage, handling, and transport of explosives;

## **Training**

- Employees should be trained on the hazards, precautions and procedures for the safe storage, handling and use of all potentially harmful materials relevant to each employee's task and work area;
- Training should incorporate information from the Material Safety Data Sheets (MSDSs) for potentially harmful materials;
- Personnel should be trained in environmental, health and safety matters including accident prevention, safe lifting practices, the use of MSDSs, safe chemical handling practices, proper control and maintenance of equipment and facilities; and
- Training also should include emergency response, including the location and proper use of emergency equipment, use of personal protective equipment, procedures for raising the alarm and notifying emergency response teams, and proper response actions for each foreseeable emergency.

## **Record Keeping and Reporting**

- The sponsor should maintain records of significant environmental matters, including monitoring data, accidents, occupational illnesses, spills, fires and other emergencies;
- This information should be reviewed and evaluated to improve the effectiveness of the environmental, health and safety program; and
- An annual summary of the above information should provide to IFC.

## **Screening Process**

The screening process used by the World Bank classifies proposed projects into one of four categories, depending on the type, location, sensitivity, and scale of the project and the nature and magnitude of its potential environmental impacts.

- Category A: A proposed project classified as Category A if it is likely to have significant adverse environmental impacts that are sensitive, diverse, or unprecedented. These impacts may affect an area broader than the sites or facilities subject to physical works.
- Category B: A proposed project is classified as Category B if its potential adverse environmental impacts on human populations or environmentally important areas – including wetlands, forests, grasslands, and other natural habitats—are less adverse than those of Category A projects. These impacts are site-specific; few if any of them are irreversible; and in most cases, mitigatory measures can be design more readily than for Category A projects.
- Category C: A proposed project is classified as Category C if it is likely to have minimal or no adverse environmental impacts. Beyond screening, no further EA action is required for a Category C Project.

- Category FI: A proposed project is classified as Category FI if it involves investment of Bank funds through a financial intermediary, in subprojects that may result in adverse environmental impacts.

NSBT project has classified as category B project hence, required by EPA-SL Acts 2010, for NSBT to prepare an Environmental Assessment Study (EAS) to address the environmental and social concerns related to sub-projects and a Resettlement Policy Framework (RPF) where possible to address potential issues of displacement and resettlement in connection with some aspects of the project.

## **2.14 The National Lands Policy (2005)**

The Land Policy of Sierra Leone aims at the judicious use of the nation's land and all its natural resources by all sections of the Sierra Leone society in support of various socio-economic activities undertaken in accordance with sustainable resource management principles and in maintaining viable ecosystems.

For the purposes of sustainability of land use, its' stated in section 4.4 of the policy that:

- i. Land categories outside Sierra Leone's permanent forest and wildlife estates are available for such uses as agriculture, timber, mining and other extractive industries, and human settlement within the context of a national land use plan;
- ii. Inland and coastal wetlands are environmental conservation areas and activities considered incompatible with their ecosystem maintenance and natural productivity are strictly prohibited;
- iii. All land and water resources development activities must conform to the environmental laws in the country and where Environmental Impact Assessment report should be required. Environmental protection within the 'polluter pays' principle will be enforced; and
- iv. Provided that payment of adequate compensation in reasonable time will be made, government may acquire land wherever and whenever appropriate to, among other things:
  - a) Facilitate urban renewal and redevelopment programmes;
  - b) Implement any rural or urban improvement programme;
  - c) Provide social infrastructure;
  - d) Supply promptly serviced or un-serviced lands at prices, which can secure socially and economically acceptable patterns of economic development;



## **2.16 Convention of the International Trade of Endangered Species (CITES)**

The requirements of this convention became effective in Sierra Leone on the 16<sup>th</sup> January 1995. The convention seeks to eliminate and/or reduce trade in certain species inclusive of those that are considered endangered. By this convention, a list has been produced comprising of species that require protection against trade. The majority of the species listed in CITES, are those also considered by the International Union for Conservation of Nature and Natural Resources (IUCN), as endangered and threatened. CITES also takes cognizance of species not necessarily threatened, but which require trade control to protect them from being threatened.

### **Safe Handling and Usage of Chemicals (SHUC)**

The US Occupational Safety and Health Administration (OSHA) hazard Communication Standard, Canada's Workplace Hazardous Materials Information System (WHMIS) and the European Community's Commission Directive 91/155/EEC. In all directives, the requirements for preparing a complete MSDS established. Criteria for the data sheets include information about the identity of the chemical, its supplier, classification, hazards safety precautions and the relevant emergency procedures. The following discussion details the type of required information included in the 1992 ILO Code of Practice Safety in the use of Chemicals at Work.

Under the ILO Code of Practice, workers and their representatives should have a right to an MSDS and to receive the written information might be for specialist-consultant, further information may be needed from employer NSBT.

## **2.17 SIERRA LEONE ENVIRONMENTAL AND SAFEGUARD POLICIES**

In Sierra Leone, the World Bank Safeguard Policies adopted and applied. The ESHIA developed, and currently in review, would be design so that all investments of NSBT should comply with states laws of Sierra Leone including, the environmental and social safeguards policies of Sierra Leone. Safeguard policies in discussion herewith, has its scooped from the World Bank group.

The safeguard policies are as follows:

- Environmental Assessment (OP4.01, BP4.01, GP4.01)
- National Habitats (OP4.04, BP4.04, GP4.04)
- Pest Management (OP4.09)
- Involuntary Resettlement (OP/BP 4.12)
- Safety of Dams (OP 4.37, BP 4. 37)
- Projects on International Waterways (OP 7.50, BP 7.50, GP 7.50)
- Management of Cultural Property (OPN 11.03)
- Indigenous Peoples (OD 4.20)
- Projects in Disputed Areas (OP 7.60, BP 7.60, GP 7.60)

## **2.18 Environmental Assessment (OP 4.01, BP 4.01, GP 4.01)**

This policy requires environmental assessment (EA) of projects/investments proposed for Bank financing to help ensure that they are environmentally sound and sustainable, and thus improve decision-making. The depth and type of analysis of the EA process depend on the nature, scale, and potential environmental impact of the activities proposed for funding under the project. The EA process takes into account the natural environment (air, water and land); human health and safety; social aspects (involuntary resettlement, indigenous peoples, cultural property) and transboundary and global environmental aspects.

The environmental and social impacts of the NSBT with its alternatives site incorporated, would involve activities and investments made. These activities include construction and operation of facilities (Buildings, Unloading, Bagging, the construction of Weigh Bridge, etc).

OP 4.01 further requires that the EA report must be disclosed as a standalone document. GOSL and the World Bank set a condition for appraisal of the project. The disclosure should be both in Sierra Leone where the public can access and assess its inclusions on environmental delineation.

## **2.19 Natural Habitats (OP 4.04, BP 4.04, GP 4.04)**

The conservation of natural habitats, like other measures that protect and enhance the environment, is essential for long-term sustainable development. The Bank therefore supports the protection, maintenance, and rehabilitation of natural habitats.

Natural Habitats are land and water areas where (i) the ecosystems biological communities are formed largely by native plant and animal species, and (ii) human activity has not essentially modified the areas primary ecological functions. All natural habitats have important biological, social, economic and existence value. Important habitats may occur in tropical humid, dry and cloud forest; temperate and boreal forest; Mediterranean-type shrub lands; natural arid and semi-arid land, mangrove swamps, coastal marshes, and other wetlands; estuaries sea grass beds, coral reefs, freshwater lakes and rivers; alpine and sub alpine environments, including herb fields and grasslands.. This policy could be of essence to the real establishment of NSBT in joint support with Nectar Group as facilitator. The guide allows the management to fully abide and share information of environmental management designs and plans.

## **2.20 Consultation and Disclosure Requirements**

OP 4.01 requires that for “all Category A and B Projects”, the borrower consults project-affected groups and local non-governmental organizations (NGOs) about the project’s environmental aspects and considers their views. The borrower initiates such consultations as early as possible. For Category A’ Projects, the borrower consults these groups at least twice: (a) shortly after environmental screening and before the terms of reference for the EA are finalized: and (b) once a draft EA report is prepared”.

OP 4.01 further requires that “for meaningful consultations between the borrower and project affected groups and local NGOs on all Category A and B projects proposed for NSBT or IDA financing, the borrower provides relevant materials in a timely manner prior to consultation and in a form and language that are understandable and accessible to the groups being consulted”.

Category A’ reports for a project proposed for financing by any agency or IDA are to be made available to project-affected groups and local NGOs, and the public at large in the borrowing country. An EIA report for projects proposed for IDA funding or other agencies are prerequisites to bank appraisal.

Public consultation and disclosure should be address by various pieces of Sierra Leone’s legislation and guidelines. Since there are various types of donors whose requirements differ from each other, Sierra Leone’s legislation is more flexible and less stringent than the Bank policies in this respect. However, there is no limitation as to the extent and scope of consultation and disclosure, nor as to whom should be consult. There, is no real contradiction between Sierra Leonean legislation and Bank policies, which can be applied to their public consultation and disclosure without violating Sierra Leonean law.

## **CHAPTER THREE**

### **3.0 DESCRIPTION OF NSBT ENVIRONMENT**

#### **3.1 Land Use pattern**

The Queen Elizabeth II Quay has its concrete pavements and sloppy training that runs from North and belt through Westwards towards the Bishop Johnson area, whilst the port is open to the Sierra Leone former Producing Marking Board at eastward area on a flat landscape with eroded sedimentary and Quartz rocks that shown at edges of the beach. As back in the 90s, the work of the port was with mechanical machineries, that uses less automatics; these conditions of ad hoc used to induce incidences at work and requires more staff at risky operation. As NSBT and other associates came into the Port business, many intra and inter personal gains had achieved, this keep the operation of the Port in a very functional form that over time has reduces the susceptibility of accidental rates and increase the delivery time of vessels; thus help shipping companies to avoid inconveniences at the port.

The area under NSBT operation has stores that were built since back in 80s, but rather has received much facelift with modern systems of management that works on International Accreditation with operational efficiency on delivery of goods and services at the Port, time spent in weighing, loading and offloading has reduced tremendously. The entire port has it original placement activities on commerce and engineering operations with no other activities allowed this is in a way to combat hazard events. See the satellite imagery of NSBT operations and the Queen Elizabeth Quay the II platform.

### **3.2 ENVIRONMENTAL MONITORING PROCEEDURES AND INFORMATION**

#### **3.2.1 Atmospheric Monitoring Data**

Source: atmospheric percentage relative humidity, minimum and maximum humidity values and their respective temperatures was assess. Few anomalies noted; percentage Relative Humidity and dew points temperatures seem undulating as reference to atmospheric characteristics.

Requirement: It is very important for the company to observe data as regards to the stated parameter, since extreme abnormalities on RH% and Dew points temperatures could influence moisture and insulating air that could directly disturbed plant growth, human comfort and chemistry of materials.

Verification: A capacitance-type sensor was attach at the meter, to measure relative humidity. This Changes in relative humidity causes changes on the reading. Response time of 60 seconds was adapted as intervals for every session and appropriate toggles of dew point and wet bulb values where obtained. Prior to calibration on HR33 (MgCl) and HR75 (NaCl) salts base was used on the referenced calibration chat list.

### **3.2.2 Noise Monitoring Data**

To measure noise levels in relations to temperature and Relative humidity. Noise is measure in units called decibels (dB) with sound –level meters. The exercise done with a simple pocket

Sound –level meter that usually adequate for environmental monitoring in work place. In process, the equipment was allow to do internal calibration of clean air first for a precision on sampling. Ideally, the sound level-meter consists of a microphone, an amplifier, and an indicating meter, which allows the level of sound to be obtain directly in (Decibel-dB).

As required by EPA, an alertness to noise level shown to be one major impact that the operations of Rainbow Company will be charge for. Therefore, the monitoring of criterion variable like air quality placed an important role to this year’s environmental management plan.

### **3.2.3 Soil and Water Monitoring**

This work carried in order to establish the relationship between NSBT and associated operations environment along with its surrounding soil and water fringes.

#### **Objectives**

1. To determine the physico-chemical properties of different soil sweeps around the NSBT concession area.
2. To determine the physico-chemical properties of the water body around the NSBT concession area.

#### **Methodology:**

Soil sweeps and water samples collected in February and March 2017 at the NSBT concession area. Sweep soil samples collected around the concession area. On each sampling date, three soil sweep samples selected randomly. The sample points that shared similar physical appearance

characteristics were composited. One of the samples observed to be clinker, another in the middle of peak activity area and the third at a less active area. The last two were mixtures of different particles whose origin not known initially. In addition, one composite water sample taken at the edge of the sea that borders with the company on each sampling date. The samples collected in 500ml samples containers. All samples of soil sweeps and water taken to the laboratory for analysis.

### 3.2.4 Laboratory analysis of soil sweeps and water samples

The analyses carried out at the Njala University Quality Control Laboratory at Njala Campus following given standard operation procedures. The following table shows the analysis carried out, procedures/methods followed and the instruments used.

Test Parameter	Test method	Instrument
Ph	-	HANNA pH meter
Electrical Conductivity	-	Digital Electrical Conductivity meter
Turbidity	-	Hach Turbidimeter
Aluminium	Titrimetric	-
Zinc	-	HACH Portable Colorimeter
Iron	-	HACH Portable Colorimeter
Magnesium	-	HACH Portable Colorimeter
Calcium	Titrimetric	-
Carbonates	Complex metric titrations	-
Bicarbonates	Complex metric titrations	-
Copper	-	HACH Portable Colorimeter
Manganese	-	HACH Portable Colorimeter
Lithium	Flame photometry	Flame Photometer
Phosphorus	Spectrophotometry	Spectrophotometer
Chlorine	Thiosulfate titration	-
Sodium	Spectrophotometry	Spectrophotometer
Barium	Flame photometry	Flame photometer

Table 3: Test parameters, methods and instruments used in analysing the samples collected.

### **3.3 ENVIRONMENTAL TOXICOLOGY ON CRETERIAL PARAMETER IN MONITORING**

Soil and water are the most crucial life supporting elements. Therefore, careful attention must be on these environmental components in every daily life activity. Soil and water are the hosts of almost all nutrients and interact with every other element within the environment. This implies that poor management of the soil and water resources can have detrimental effect on the establishment. Particularly, in the recent two decades, with the process of urbanization and industrialization, human activities such as discharge of industrial waste influenced soil environment significantly. It is however worth noting that soil pollution levels vary from one environment to the other. Soil and water pollution could be harmful for human health. For example, it could cause toxicity, cancer, and gene mutation. Specifically, heavy metal pollution is one of the most important issues because of the innate traits of heavy metals. Heavy metal concentration within an environment could be as result three major factors; the inherent soil properties, human activities and within the environment and those outside the environment.

Heavy metal contamination is a major problem of the environment especially of growing medium sized cities in developing countries primarily due to uncontrolled pollution levels driven by causative factors like industrial growth and heavy increase in traffic using petroleum fuels. Heavy metal contamination may occur due to factors including industrial emission and transportation

Chemicals are part of our daily life. All living and inanimate matter is made up of chemicals and virtually every manufactured product involves the use of chemicals. Many chemicals can, when properly used, significantly contribute to the improvement of our quality of life, health and well-being. Majority of the known metals and metalloids are very toxic to living organisms and even those considered as essential, can be toxic if present in excess. Such harmful chemicals include a group known as heavy metals. Heavy metals are individual metals and metal compounds that can affect human health. They are naturally occurring substances and are most times present in low amounts. However, in areas where high accumulation has occurred over long periods, heavy metals detrimental to humans health. These elements were been classed as heavy metals due to their specific gravity (5.0 or greater). Among such metals are arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver. Notwithstanding, the latter two are not known to be highly carcinogenic to humans and their effect are normally minor ones.

The most common forms of exposure of humans to these heavy metals are ingestion (drinking or eating) or inhalation of airborne particles and vaporized metals (breathing). Working in or living near an industrial site, which utilizes these metals and their compounds increases ones risk of exposure, as does living near a site where these metals have been improperly disposed. The health risks associated with some heavy metals includes:

### **3.3.1 Health Risks associated with human exposure to Arsenic**

Arsenic is odourless and tasteless. Inorganic arsenic is a known carcinogen and can cause cancer of the skin, lungs, liver and bladder. Lower level exposure can cause nausea and vomiting, decreased production of red and white blood cells, abnormal heart rhythm, damage to blood vessels, and a sensation of “pins and needles” in hands and feet. Ingestion of very high levels can possibly result in death. Long-term low-level exposure can cause a darkening of the skin and the appearance of small “corns” or “warts” on the palms, soles, and torso.

### **3.3.2 Health Risks associated with human exposure to Barium**

Barium is a very abundant, naturally occurring metal and used for a variety of industrial purposes. Despite its multitudinous applications in pharmacology and construction industries, uncontrolled exposure can be detrimental to human health. Short-term exposure can cause vomiting, abdominal cramps, diarrheal, difficulties in breathing, increased or decreased blood pressure, numbness around the face, and muscle weakness. Large amounts of barium intake can cause, high blood pressure, changes in heart rhythm or paralysis and possibly death.

### **3.3.3 Health Risks associated with human exposure to Cadmium**

Cadmium is a very toxic metal. All soils and rocks, including coal and mineral fertilizers, contain some cadmium. Cadmium has many uses, including batteries, pigments, metal coatings, and plastics. Cadmium and cadmium compounds known of its human carcinogenesis. Severe damage to the lungs may occur through breathing high levels of cadmium. Ingesting very high levels severely irritates the stomach, leading to vomiting and diarrhoea. Long-term exposure to lower levels leads to a build-up in the kidneys and possible kidney disease, lung damage, and fragile bones.

### **3.3.4 Health Risks associated with human exposure to Chromium**

Chromium used in metal alloys such as stainless steel; protective coatings on metal (electroplating); magnetic tapes; and pigments for paints, cement, paper, rubber, composition floor covering and other materials. Its soluble forms used in wood preservatives. Chromium (VI)

compounds are toxins and known human carcinogens, whereas Chromium (III) is an essential nutrient. Breathing high levels can cause irritation to the lining of the nose; nose ulcers; runny nose; and breathing problems, such as asthma, cough, shortness of breath, or wheezing. Skin contact can cause skin ulcers. Allergic reactions consisting of severe redness and swelling of the skin as dermal impact on human. Long-term exposure can cause damage to liver, kidney circulatory and nerve tissues, as well as skin irritation.

### **3.3.5 Health Risks associated with human exposure to Lead**

Because of human activities, such as fossil fuel burning, mining, and manufacturing, lead and lead compounds be found in all parts of our environment. This includes air, soil, and water. Lead used in many different ways. USEPA has determined that lead is a probable human carcinogen. Lead can affect every organ and system in the body. Long-term exposure of adults can result in decreased performance in some tests that measure functions of the nervous system; weakness in fingers, wrists, or ankles; small increases in blood pressure; and anaemia. Exposure to high lead levels can severely damage the brain and kidneys and ultimately cause death. In pregnant women, high levels of exposure to lead may cause miscarriage. High-level exposure in men can damage the organs responsible for sperm production.

### **3.3.6 Health Risks associated with human exposure to Mercury**

Mercury combines with other elements to form organic and inorganic mercury compounds. Metallic mercury used to produce chlorine gas and caustic soda, thermometers, dental fillings, switches, light bulbs, and batteries. Mercury in soil and water has the potential to be converted by microorganisms in forming methylmercury ( $\text{CH}_3\text{-Hg}$ ) which has lethal effect on Biota. The USEPA has determined that, mercuric chloride ( $\text{HgCl}_2$ ) and methylmercury are possible human carcinogens. The nervous system is very sensitive to all forms of mercury. Exposure to high levels can permanently damage the brain, kidneys, and developing foetuses. Effects on brain functioning may result in irritability, shyness, tremors, changes in vision or hearing, and memory problems. Short-term exposure to high levels of metallic mercury vapours may cause lung damage, nausea, vomiting, diarrheal, increases in blood pressure or heart rate, skin rashes, and eye irritation.

### **3.3.7 Health Risks associated with human exposure to Lead and Cadmium**

Lead and cadmium are among the most abundant heavy metals and are particularly toxic. The excessive amount of these metals in food is associated with etiologic of myriad diseases, especially with cardiovascular, kidney, nervous as well as bone diseases.

## **3.4 SOCIO-ECONOMIC ENVIRONMENT**

National demographic data could be the start to any base line research, as it involves the statistics of human populations and their dynamics to survival, growth poles in business and challenges. Concerns of people in the study area, their distribution across the area, and any concentrations of vulnerable groups could be screen in the process. Key information on the following are considered as relevant to NSBT operations. Health indicators, Educational indicators, culture, economy, infrastructure and environment.

### **3.4.1 Health indicator:**

Which determine how much resistance people can offer to any health effects of an emergency; for example: disease pattern indicates potential outbreaks of new disease or worsening of existing disease after an emergency. This could of enhance to NSBT since its employees are leaving from different places in Freetown with other expert staff though come and interact on usual terms.

### **3.4.2 Educational Indicator:**

Which determine how sophisticated the role of the community can be in participation in any response activities and the level and type of public messages that can be use, for example:

Literacy rate, which is important in the assessment as would help in planning of Community Development Actions

### **3.4.3 Culture:**

A community's culture, including its traditions, ethnicity, and social values, is highly relevant to emergency management, Attitudes towards hazards and vulnerability will be strongly influence by attitudes towards nature, technology, the causation of accidents and emergencies, and the value of mitigating or contingent actions.

### **3.4.4 Economy**

The economy of the community requires protection, and the more sensitive and vulnerable sections of the economy require careful consideration in economy management. It is likely that an emergency that causes considerable structural and environmental damage would devastate the local tourism industry etc.

### **3.4.5 Infrastructure**

The infrastructure (both physical and organizational) of a community is often highly vulnerable to hazards, particularly natural hazards. A vulnerability assessment should consider any possible damage to power generation and distribution systems, water supplies, communications systems, etc. these are often referred to as “lifelines”, and relevant considerations include:

- Effect of loss of services on the community;
- Possible extent of the damage;
- Alternative means of supplying the service;
- Time required for repairs;
- Cost of repairs

It is also important to have a basic description of the government structure, and of service and community organizations, since they will provide the mechanism for emergency management programmes and strategies.

### **3.4.6 Environment**

The environment is an important determinant of settlement patterns and lifestyles of communities; it can be defined as the natural surroundings, including plants and animals, water, air, and soil. Damage to any of these elements may affect other elements of the environment. Many hazards can adversely affect the environment, including chronic (continuous and low-level) or acute (sudden and high-level) paradoxically, while the environment nurture the community it can also be the source of some of the greatest natural hazards. Describing the environment in vulnerability assessment will often identify some hazards that yet been considered.

### 3.5 DISTRIBUTION OF TOTAL POPULATION BY REGION, DISTRICT, CHIEFDOM, AREA OF RESIDENCE AND SEX IN SIERRA LEONE

#### 3.5.1 Rural and Urban Population Distribution in Western District Sierra Leone

**Table 4 Rural and Urban Population Distribution in Sierra Ice Cream main marketing zone**

District	All Residence			Rural			Urban		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
Western area	1500234	749558	750676	43638	22235	21403	1456596	727323	729273
Western Area Rural	444270	221351	222919	43638	22235	21403	400632	199116	201516
Koya	70423	34381	36042	20584	10229	10355	49839	24152	25687
Waterloo	213778	104978	63603	16396	8621	7775	113185	57357	55828
Western Area Urban	1055964	528207	527757	-	-	-	1055964	528207	528207
Central 1	62499	32023	30476	-	-	-	62499	32023	32023
Central 2	21413	11623	9790	-	-	-	21413	11623	11623
East 1	61244	30380	30864	-	-	-	61244	30380	30380
East 2	89530	45336	44194	-	-	-	89530	45336	45336
East 3	448572	222544	226028	-	-	-	448572	222544	222544
West 1	53981	26564	27417	-	-	-	53981	26564	26564
West 2	130149	64657	65496	-	-	-	130149	64657	64657
West 3	188576	95080	93496	-	-	-	188576	95080	95080

Source: Statistics Sierra Leone 2015 CENSUS.

#### 3.5.2 The population development in Western Area Urban.

**Table 5 Population distribution in Western area Urban only**

Name	Status	Population Census 2004-12-04	Population Census 2015-12-04
Western Area Urban (Freetown)	District	772,873	1,055,964
Central I	Ward	50,271	62,499
Central II	Ward	20,135	21,413
East I	Ward	55,166	61,244
East II	Ward	79,934	89,530
East III	Ward	316,409	448,572
West I	Ward	46,319	53,981
West II	Ward	91,345	130,149
West III	Ward	113,294	188,576
Sierra Leone	Republic	4,976,871	7,092,113

Source: Statistics Sierra Leone (web)

## **3.6 Applied Socio-economic methodology for NSBT**

### **Objectives**

The objective of this component is to assess the socioeconomic conditions and impacts of the proposed Container bulk Terminal and Warehousing project.

### **3.6.1 Methodology**

#### **Data collection**

Both secondary and primary data were collected during the study. A desktop review was done to gather the existing secondary data and information. Primary data were collected using a combination of socioeconomic data collection techniques namely semi-structured interviews mainly by Focus Group Discussions (FGD), observations, and key-informant interviews. Most of the time, observation and semi-structured interviews were used simultaneously. Field assistants hired and trained on these socio-economic assessment techniques before the data collection began. Three communities interviewed and amongst the 50 people interviewed in three groups from the three communities in three business days. In each community, one FGD held. Present per discussion were 2 Health workers, 2-3 teachers, and the rest constituted traders, council workers if available, transport owners, 1-2 fishermen, residential property owners, residents, company workers, and religious leaders.

#### **Semi-structured Interviews**

Three (3) Communities were randomly selected out of 5-6 immediate surrounding communities directly affected by the project operations. Further random selection of Interviewees in a community to represent in the group discussion was successful and included the above categories listed. Semi-structured interviews conducted using interview guides/semi-structured questionnaires with open-ended questions. All FGDs took place in quiet premises and the researchers made sure that the community were well represented. In the cases of Key Informant Interviews, interviews were conducted at their business places with appointments booked for interviews to be conducted at a time that was convenient to the respondents. These appointments followed a clear explanation of the objectives of the study. Using this method, it was possible to probe for answers, follow-up the original questions and pursue new lines of questions. It created room for two-way interaction and exchange of information between the interviewer and the respondent. During the interviews, the questionnaires was used, together with notes taken were taken on issues that emerged but that were not exhaustively captured by the questionnaires. At the end of each day, the research team sat together to review and harmonize the results.

#### **Observation**

Direct observation of activities and unique features in the area under consideration was carried out. Events from the surrounding were attentive and recorded by the research team. This method provided first-hand information about the area. The information then formed a basis for detailed interviews with the respondents. It was also useful in confirming some issues that came up during the semi-structured interviews. During observation, questions were asked respondents about issues that are relevant to the variables under investigation. The questions concentrated heavily on issues

that could not be observed. At the end of each day, the research team sat to review the quality of data and information collected.

### **Key-informant Interviews**

Key-informant interview was used to extract information from the opinion leaders in the affected areas. These key-informants (opinion leaders) were people who held some respected positions in the society. The key informants included the religious leaders, some businesspersons who command respect in the local community, local leadership, and fishermen association chairperson. The key informants gave insight on many issues that needed further clarifications and helped in the validation of information collected using the other research methods.

## **3.7 OCCUPATIONAL AND HEALTH ENVIRONMENT**

**Overview:** As the company's commitments, required fulfilment to its ISO9001 and 14001 there enshrined principles on effectiveness to safety that could hand gains on either side of the interaction; that is, both the company and the external environment. Therefore, the consulting team has always been in emphasis with ISO 18024(OHS), national standards such as Factory Safety Acts 1974 and International Labour Organization (ILO)-1993, Chapter 3 and Codes of practices such as Hazard communication, safe handling and Chemical uses by ILO Convention No.170 and Recommendation No. 177. Compliances rating could be of highest significant since it addresses property damage and life protecting mechanisms for better work premises.

The review work in research, shall assess the methodology in use by NSBT Company in order to prone events that could dissuade the normal operations of NSBT and the propose expansion facility under sleeve by Nectar Group as key stakeholder to NSBT. Areas on interest are; spills prevention, incidents or accidents recording formalities and gains, OHS aspect and designs, implementation and leadership for actions on OHS.

## **3.8 Environmental Waste Management and Methodologies in use by NSBT**

### **Foreword**

Preventing spills, incidents or accidents through good project planning, design, implementation and leadership became a concern that resorted on company review of ESHIA. However, if a spill or other unplanned event occurs, we have plans and processes in place to ensure we can respond effectively.

Facilities provided include a trash bins and waste sorting lots. Prior to any construction of NSBT health and safety units will notify Shitanga Logistics LTD as servicing company on waste collection in the Port Authority operations. Management approach in waste handling goes in lined with ISO14001 and ISO9001. Sorting approach is one accepted methodology for NSBT, in a way to understand operational influences on generation rate per department and working periods. Another aspect of intervention is the process of waste categorization-as NSBT intends to be in position in identifying any possible sort of hazardous waste for correct handling and disposal using ILO, EPA-SL and Freetown City Council Statutory Instrument NO.6 of 2010.

## Purpose

The Purpose of this inclusion on the document is to summaries the Environmental influence that the company (NSBT) has its role-play by relying contributed to within the given periods.

## Scope of Environmental Safety Management Unit on waste generation

1. Assessing volumes of waste generated within NSBT concession area
2. Disposal methods of general Waste / Chemicals / Waste Water
3. Preparing details of operational efficiency and constraints management reports in quarter bases

## NSBT expectation on Solid Waste

Reuse, Recycling and Reduction of Waste Generation has mainly identified as future drive for sustainable solid waste management within the company concession. Therefore, there are plans on the way to improve on quantification of generation, identification of waste potentiality for commerce, transform into possible agro-feeds, and manure for food waste possible.

## Waste Identification

Within the quarterly monitoring process, NSBT had able to identify frequency of waste generated as Papers>Plastics>Tins from can drinks and sweeps from dust intrusion. These classified, as most generated. Other aspects of waste are the hazardous type that UNEPA identifies as Corrosive on skin, Acidic; highly volatile, highly reactive on exposure to sunlight, explosive, Radioactive and toxicity level index very high. Examples of such are:

- i. Fuel oils and solvents as waste-(Type: Organic liquid)
- ii. Plastics
- iii. Aerosol cans;
- vi. Filters
- v. Electronic waste like computer cartridges

**Table 6 Aspect on Solid Waste Management**

Type of waste generated	Quantity generated in Kg or g	Method of collection	Quantity of gen/department/Vol	Frequency of generation

## **Possibilities for Maintenance Dredging**

### **Overview:**

Maintenance Dredging is important to the conduct of maritime commerce, NSBT aspect to dredging activities will occur non- perennially on its bathing area at the Queen Elizabeth Quay; this could result from many factors that seem to compromise ideal anchoring of ships due to sedimentation of debris and mud around NSBT concessional area. Maintenance of navigable waterways depths is a continuous process in many ports and harbors, whose bottom contours are constantly changing due to silting near the mouth of rivers. In addition, as ship has become larger and draft requirements (depth of the ship's hull below the waterline). In reality if the country as to increase commerce via imports and export routes; there should be relative monitoring of sea depth, NSBT in attendance to its Environmental Monitoring processes necessitate the possibility for Maintenance Dredging within its concessional area.

### **Methodology for Maintenance Dredging**

In short, dredging is essentially the underwater removal of sand, soil or silt and its movement from one place to another, for purposes of deepening a channel or navigable waterway. Dredging of NSBT in prospects will arise on decades or mid-decades scaling, provided there is no interoperation on sea management or other sea users, including upstream debris management, drainage continuity flow and effective Solid Waste Management (SWM) in the country. NSBT intends to carry an effective method of silt suction approach for ideal dispersal into the open bays with less use of mechanical processing that could possibly reduce the release of fuel oil and noise during work processing.

## **CHAPTER FOUR**

### **4.0 REVIEW DATA ON NSBT ENVIRONMENTAL SOCIAL HEALTH IMPACT ASSESSMENT**

**Overview:** As the study requires overview of the existing ESHIA, the team of consultant in review of the NSBT environmental footprints, however references the ESHIA documents as base line and went ahead in trying to stratified specific delineation area with the use of new and custom methodology and tools in order to have correctness of research. In retrospect, all stakeholders interviewed were over whelms and sufficiently assisted the process of information sharing, with physical, Biological and chemical data assessed on NSBT influences to its external environment was carefully assessed. SPSS version 23 used in the simulation of qualitative response into quantitative for setting of effective environmental management actions like the CDAP and EMP.

#### 4.1 Assessing volumes of waste generated within NSBT concession area

Table 7 NSBT analysis on machinery fluids and assessment

Month	Types of lubricant used						
	Hydraulic oil	Engine oil	Transmission oil	Radiator coolant	Brake fluid	Degreaser/engine cleaner	Oil spill remover
December 2016	13	5	1	25	1	8	3
January 2017	4	10	-	10	-	-	2
February 2017	11	10	1	4	-	2	7
March	2	38		15	-	10	-

Source: From monthly lubricant record-(2016-2017)

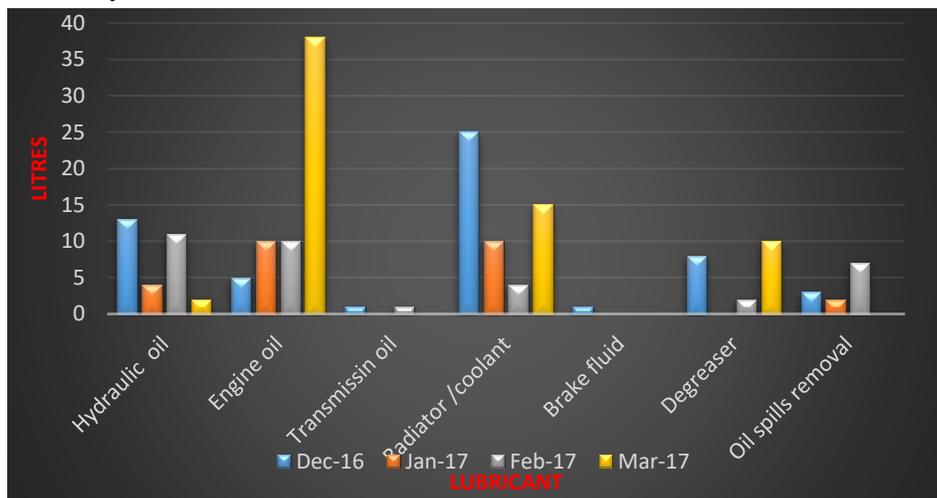


Figure 5: Showing Statistical analysis of waste evaluation at NSBT

Commentary: the quantitative data can be seen as trend difference on litres of generation to liquid waste type for the period stated. The highest waste in generation found to about (35 Ltr) for engine oil and followed by radiator /coolant oil which is found to (25Ltr)

#### 4.1.1 Disposal methods of all General Waste / Chemicals / Waste Water

NSBT are committed to have all their waste collecting bins/containers closed and clearly labelled to avoid difficulty in sorting. As this method, ease the service of Shitanga Logistics LTD.

Pictures shows the real aspect of NSBT Solid waste management technique on ground



**Figure 6** Showing sorting procedures of waste via colour

#### 4.2 ATOMOSPHERIC CONDITION AT NSBT WORK PREMISE

**Table 8 : Atmospheric condition within Work shop**

Date: 20-03-17

	Atmospheric reading			
	Relative Humidity (%)	Time(Hr/Sec/Min)	Wet Bulb(Wb)/°C	Dew Point/°C
Initial	60.9±63.0	1.00PM	25.3	23.4
Min	64.0±64.8	1.10PM	23.5	24.4
Max	65.9±68.6	1.20PM	25.7	24.1

**Table 9 : Atmospheric condition outside training hall**

Date: 20-03-17

	Atmospheric reading			
	Relative Humidity (%)	Time(Hr/Sec/Min)	Wet Bulb(Wb)/°C	Dew Point/°C
Initial	48.8±57.2	1.30PM	26.0	22.6
Min	47.6±48.8	1.40PM	24.4	21.5
Max	49.1±50.1	1.50PM	26.2	23.1

**Table 10: Atmospheric condition outside NSBT East wards end**

Date: 20-03-17

	Atmospheric reading			
	Relative Humidity (%)	Time(Hr/Sec/Min)	Wet Bulb(Wb)/°C	Dew Point/°C
Initial	43.5±48.9	2.00PM	25.9	22.8
Min	46.7±48.7	2.10PM	25.5	23.3
Max	47.7±49.9	2.20PM	26.5	23.2

**NSBT Noise level analysis**

Table 10 Noise levels assessment

Area assessed	Criteria	Noise	Expert comment on Activity
<b>Work shop</b>	≤65dBA/8HRS loading	57.5±58.0 dB	Insignificant levels and ideal to for human without PPEs
<b>Outside training hall</b>	≤65dBA/8HRS loading	59.0±60.8 dB	Insignificant levels and ideal to for human without PPEs
<b>outside NSBT East wards end</b>	≤65dBA/8HRS loading	65.3±67.6 dB	Insignificant levels and ideal to for human without PPEs

#### 4.2.1 Soil and Water assessment

The tables below shows the results obtained from the analysis of the three-soil sweep samples collected in February (Table ) and March (Table ) 2017.

Table 11 : Results obtained from the analysis of soil sweep samples collected in February 2017

Test Parameter	Unit	Sample Label		
		Clinker	Dust Sweeps (Midway)	Dust Sweeps (Edge)
Ph		11.32	6.92	5.51
EC	mS/cm	1164	336	212
Aluminum	mg/kg sample	35.2	11.1	11.3
Zinc	mg/kg sample	6.63	1.23	0.01
Iron	mg/kg sample	22.6	3.20	0.05
Magnesium	mg/kg sample	2.06	1.12	1.12
Calcium	mg/kg sample	12.3	1.20	1.11
Phosphate	mg/kg sample	3500	25.00	22.00
Copper	mg/kg sample	0.09	0.02	0.00
Manganese	mg/kg sample	0.08	0.04	0.04
Barium	mg/kg sample	0.00	0.00	0.00
Lithium	mg/kg sample	0.001	0.001	0.002
Nitrates	mg/kg sample	0.00	0.25	2.35

The results obtained from the analysis showed that most of the test parameters were present in higher amounts in the clinker sample as others. However, the results are not surprising as such are the kinds of characteristics of clinker. High pH, EC, Aluminium, Zinc, Iron and phosphate were recorded. It is therefore imperative that serious attention been paid to in handling the product to avoid negative impact on human health. Substances with high pH values are caustic and therefore been handled with care. The seriousness of the detrimental effect of heavy metals on human health cannot be overemphasized. Although the clinker was low in copper, manganese, barium and lithium, care must be in process to avoid accumulation over time.

The dust sweep samples recorded very low values with those obtained from the point of more activities having slightly higher values than those recorded for the less active areas (Edges). This difference in values is however due to the accumulation of dust raised by moving vehicles owned by the company itself and a lot more from other factories. Another source could be dust drifted by wind from the central business district of Cline town. Similar results were obtained from the results obtained from the two sets of analysis were not significantly different from each other.

Table 12: Results obtained from the analysis of soil sweep samples collected in March 2017

Test Parameter	Unit	Sample Label		
		Clinker	Dust Sweeps (Midway)	Dust Sweeps (Edge)
Ph		11.06	6.78	6.01
EC	mS/cm	1144	322	222
Aluminum	mg/kg sample	35.7	10.2	11.5
Zinc	mg/kg sample	6.25	1.53	0.00
Iron	mg/kg sample	25.3	3.22	0.05
Magnesium	mg/kg sample	2.76	1.21	1.28
Calcium	mg/kg sample	12.3	1.20	1.11
Phosphate	mg/kg sample	3400	23.00	22.00
Copper	mg/kg sample	0.07	0.02	0.00
Manganese	mg/kg sample	0.08	0.04	0.06
Barium	mg/kg sample	0.00	0.00	0.00
Lithium	mg/kg sample	0.00	0.00	0.001
Nitrates	mg/kg sample	0.00	0.21	2.35

The table below shows the results obtained after analysing the water samples. With the exception of pH, EC, Mg, Ca, Cl and Na all other parameters analysed found to be low. It is of no doubt that, the aforementioned parameters are high considering the nature of the water body. Notwithstanding, care must be taken on the nature of materials use for construction purposes to avoid the destructive nature of salts from the sea breeze.

#### 4.2.2 Water samples analysis

Table 13: showing water sample assessment

Sample Label	Test Parameter	Result Feb. 2017	Results Mar. 2017	Unit
NSBT WATER SAMPLE	pH	7.93	7.89	pH
NSBT WATER SAMPLE	Electrical Conductivity	3.40	3.60	S/m
NSBT WATER SAMPLE	Turbidity	0.35	0.26	mg/L
NSBT WATER SAMPLE	Aluminium	0.06	0.05	mg/L
NSBT WATER SAMPLE	Zinc	0.01	0.00	mg/L
NSBT WATER SAMPLE	Iron	0.05	0.07	mg/L
NSBT WATER SAMPLE	Magnesium	1,220	1,230	mg/L
NSBT WATER SAMPLE	Calcium	336	321	mg/L
NSBT WATER SAMPLE	Carbonates	0.02	0.03	mg/L
NSBT WATER SAMPLE	Bicarbonates	0.09	0.07	mg/L
NSBT WATER SAMPLE	Copper	0.00	0.00	mg/L
NSBT WATER SAMPLE	Manganese	0.001	0.001	mg/L
NSBT WATER SAMPLE	Lithium	0.09	0.09	mg/L
NSBT WATER SAMPLE	Phosphorus	0.08	0.10	mg/L
NSBT WATER SAMPLE	Chlorine	10,504	10,312	mg/L
NSBT WATER SAMPLE	Sodium	8,551	7,125	mg/L

#### Recommendations

Deposition of air pollutants would be susceptible to capture by the plant canopy and accumulated in or on the leaves. As the accumulation is roughly a function of the deposited amount of pollutants, the exposure time and the effects of climatic factors are of prime importance. As such, many plant species are useful for bio monitoring atmospheric deposition of pollutants. In the case of heavy metal containing aerosols, the elemental particles would accumulate on the leaf surface. However, there is no adequate method in completely removing all heavy metals originating from the dust deposition, as fine particulates can enter the leaves via stomata and fixation of particulates by epidermal cells may occur. There is also possibility of skin itching effect by exposure population if workers not protected to work when there is heightening operation in port as most of dust containments come from other operational footprints in the quay.

### 4.3 SOCIOECONOMIC DATA ASSESSMENT

#### Overview of the study area:

This study sampled three (3) communities surrounding the concession demarcation found in the Central II of the Western Area Urban Division of the Municipality of Freetown. Some of the surrounding communities engage in urban vegetable production and artisanal fishing mostly for consumption. The Atlantic estuary bound more than half of the concession on one side. Along this waterway, shipping cargoes berth the quay every day and week. Fishing is not allowed along this particular stretch. When they do fish, they do so individually and in small paddleboats. Based on the responses recorded, Fishermen are community inhabitants that mainly fish in groups. The inhabitants describe the fishing type as “line-fishing”. No one uses fishing nets for fishing in these communities because they lack a fishing ground and no one owns a fishing net in the communities surveyed. The Fishermen available in the community engage in this activity as a source of protein. Women and children do not partake in this activity.

According to the respondents, the prevailing diseases in the area are malaria, typhoid fever, convulsion/seizure, cholera, common cold, hernia, joint pains, dysentery, river blindness, stomach aches and ulcer that happen throughout the year. There were suspected cases of Ebola during the country’s epidemic Ebola Virus disease in the communities. This situation disrupted their businesses, and left them with no option except to sit back and watch until it passed. The participants asserted that children and women are the most vulnerable, when it comes to diseases. Children suffer mostly from malaria, typhoid fever, and seizure. Men suffer mostly from pains, hernia, ulcer, and river blindness. Women suffer mostly from ulcers, malaria, dysentery, and common cold. The diseases by gender reflect the gender roles in the area. The men mostly engage in unskilled hard labour like working at the quay as load carriers. Their activities expose them to the diseases like pains, and cold, as mentioned. Ulcer is common among all gender, probably due to extreme poverty and, hence, lack of sufficient food. It is very common for people to have only one meal per day in these communities. The most common rainy season diseases are dysentery, cold, and cholera. Open defecation in the ocean (as observed) is predominant in a couple of communities surveyed; especially Kanikay Wharf and the bay at Seaside Community as there are no proper refuse and sewage disposal systems in these communities. During the rainy season, surface runoff transports the faecal material into the estuary. The other types of diseases are prevalent throughout the year.

According to the WHO, about 1.25% of the population aged between 15-and above, are positive of HIV/AIDS, and the total of the population that are positive is 50,882 of the Sierra Leone Population (WHO 2015). It reports that 4,398 of children age 0-14 lived with the disease. Women are predominant 15-and above with the statistic of 30,438, with Men 15-and above 20,444 (WHO 2015). Cell phone use is very common in the communities, literally, every household has at least two cell phones, and everyone considers this asset a necessity. The national power grid reaches to these communities. There are prepaid meters in every house that help in the billing of the amount of electricity consumed.

In addition to cell phones, the communities use other means of communication especially with the rest of the municipality and other nearby communities around them. They have long been using the service of people as messengers to transmit information between people and places. This practice is still common and a strong part of the culture of Themnes and Limbas that make up the majority of the inhabitants in these communities. Friends and family relay messages via passers-by or friends and family members moving from one point to another. The other significant mean of communication is person-to-person contact. Parents/guardians send their children to deliver messages to neighbours, families, and friends while members of secret societies especially men of the “*Orjeh*” and “*Sokobana*” societies, have developed communication codes that only the members can understand, decode, and transmit. National television stations and FM radio stations are also major means of transmitting information to the people in these communities and other parts of the municipality.

In each of the communities, there are not demarcated, any land for these male and female secret societies. Becoming a member is prerequisite for major leadership positions in the community. Hence, these sacred places serve as training ground for young citizens, where they learn how to sustain the values and standards of the society. Details of the training are classified; severe punishment could be levy upon any member who reveals any piece of the classified information to none members. These societies are very powerful and so dear to the inhabitants. They set the standards for belief systems, interactions, and policy development. They have also been useful in maintaining the peace of the region. The leadership structures create the opportunity for individuals to work hard and hold those positions, thereby achieving great admiration and respect from the community members. According to the respondents, the practices are not counterproductive and, hence, double standard is acceptable. There are reported herbalists in these communities. They use the power of the Holy Qur’an to strengthen their African traditional powers. This merger between Islam and African traditional religion has been a very welcoming idea and is partly responsible for the large majority of Muslims in the communities. The socio-cultural dynamics in these communities, i.e., the different cultural practitioners have great respect for each other. There is high tolerance between Muslims and Christians, for example. Sundays are customarily Christian days while Fridays are customarily Muslim days, and everybody acknowledges and respects this arrangement. Muslims and Christians patronize each other in their festivals and celebrations. In fact, there have been quite a number of intermarriages between the two religions. The two main fascinating forces behind this religious tolerance are family ties and African traditional religion. Members of families divide into becoming active Muslim and Christian members and, hence, that strong family tie hinders religious fight. Additionally, members of the two religions have commonality in membership in the secret societies. Hence, the mosque or church is a place for worship, whilst the African traditional forum is a place for community cohesion. In addition to cultural tolerance, these communities have great respect for the dead. They ceremoniously bury the dead. The Muslims and Christians dignify their deceased members and burry them in specially located graveyards. These communities make use of one common cemetery, the Kissy Road Cemetery. Most of the youth embark on activities that minimize the likelihood of continuing or going to school like motorbike riding, and driving, or hanging around the quay area as casual workers for loading and off-loading vehicles and containers. The women engage in early petty trading. Majority of the women are petty traders. Poverty is also a major impediment to educational pursuit. Most parents or guardians cannot afford to pay extra school charges for their children. In the communities, just like the entire nation, elementary education is free of charge to enable all to go to school, but the extra fees requested at these schools are too high for parents and guardians to afford, as most households have more than three kids to take care of. The Guma Valley Water Company supplies are the main sources of water for domestic

purposes: drinking, bathing, laundry, cooking, and general cleaning. There are strategic areas that water tanks of capacities 10,000 litres placed for community use. Some areas of the communities have pipe borne water that seldom flows. Frequent water cuts, and unclean water from tap were some of the problems experienced and reported during the survey. The estuary also mainly serves to supply fish to the communities around the concession in talk (Cline Town and Bay, Kanikay, Seaside, Bankolay, and Moa Wharf). The communities' dependence on the Guma Valley Water Company supply source poses health risks to the population, as reported during the survey, as the tap that flows is most times not clean and fit for immediate consumption. There is no standard testing or treatment of the water sources in the communities. The only means of test is organoleptic characterization. If the water were very turbid, users would let it stand for the particles to settle at the bottom of the container and then poured out for use. If the water were clear enough, they would use it directly. This is one reason for the high prevalence of water borne and water related diseases particularly in the rainy season. Water availability in the rainy season is not much of a challenge, as compared to the dry season.

Every member in these communities depend on charcoal for cooking and food preservation. For heating purposes, electricity from the national grid is mainly used. Generator owners use petrol and diesel for business purposes and heating of homes. Just like any other community in the country at large, a meal of rice and vegetables is the staple food in the communities surveyed. The two main types of vegetables are cassava leaves and potato leaves, and sometime peanut butter soup. Other food types considered significant include cassava and its products (especially gari and foo-foo), yams, fruits, other types of vegetables (beans, okra, cucumber, and pepper), groundnut, and spices. People grow most of these food items on a very small scale. In addition to fish from the estuary, the communities buy fish brought in by petty traders at the market. A pound of beef costs just a little below SLL 20,000.00 (2.70 USD), making it a luxury for poor people.

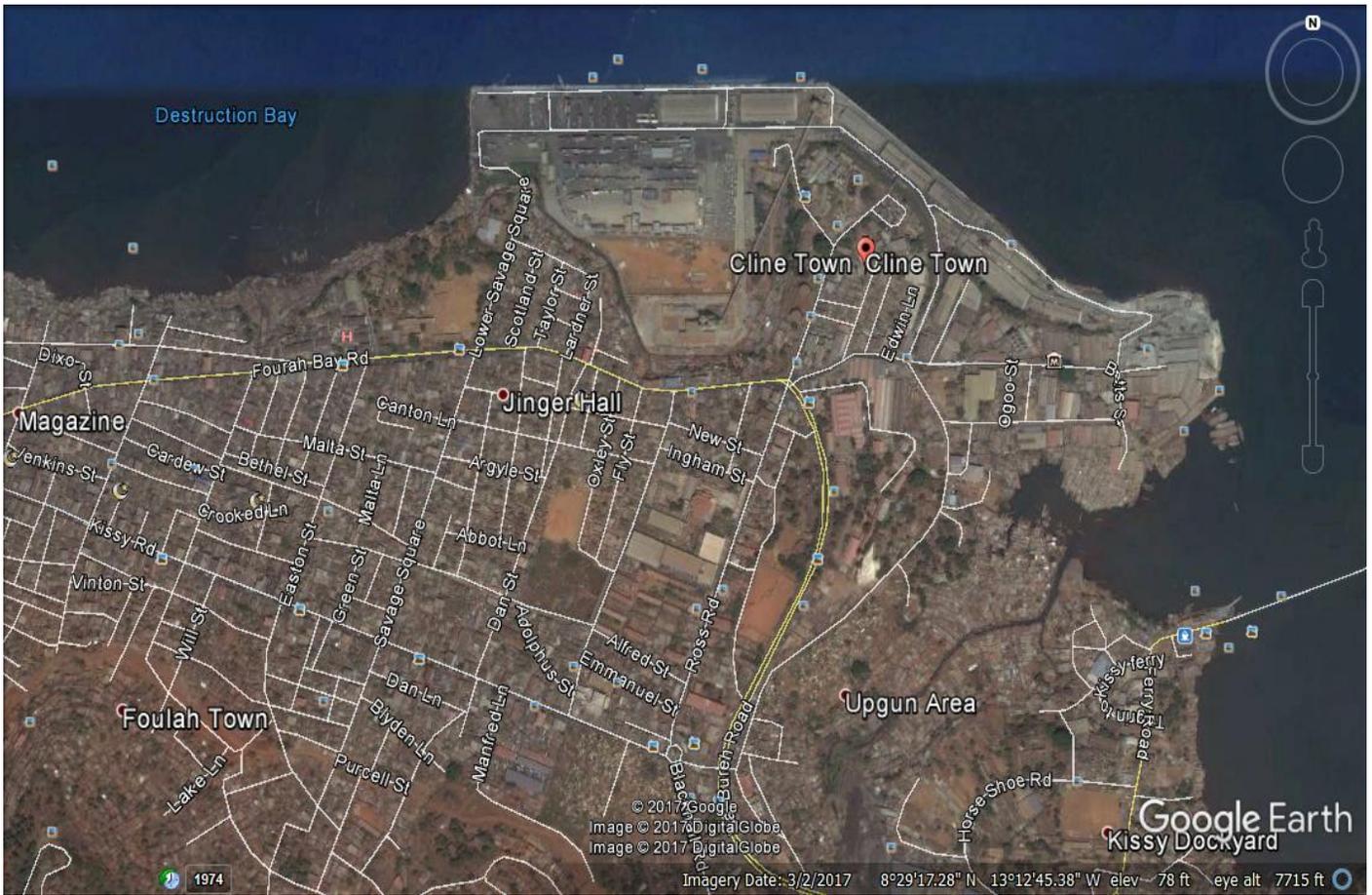


Figure 7: Showing the external working environment of NSBT. The map produced using Google Earth 2017 image.

**4.4 RESULTS AND DISCUSSIONS FROM FGDs**

**4.4.1 Cline Town and Bay Community Focus Group Discussion (8.490229, -13.209989)**

**Population of community**

Cline Town is (presently) a small community with a small population. Before now, (as gathered from the survey), this community used to stretch all the way from the quay areas to present Up-gun turntable, but now it is only confined to just around the quay. Cline Town constitutes of approximately 4,000 inhabitants. Cline Town has at least 0.38% of the urban metropolitan population (Statistics SL. 2015). It also makes up to 20.46% of the Central II Division population (Statistics 2015). The other smaller communities close to Cline Town are directly or indirectly affected by the quay operations, have populations 1% or less of the Urbanite population. Cline Town with its Bay makes up to 0.57% of the national Population, (Statistics SL 2015).

**Gender**

The community has more women (45%) than men (30%) and children (25%). The respondents believe it is a natural tendency for the women to men ratio and is beyond human comprehension. Some pointed out to the past civil war that more men were killed than women and children.

## **Livelihood**

The inhabitants' livelihood activities are mainly traders and unskilled labourers. There are civil servants in this small settlement ranging from teachers to police, and health workers, etc. There are few commercial vehicle drivers and bike riders in the community.

## **Health and sanitation**

This settlement lacks a functional health center and literally use the services of families and neighbours in times of medical complications. A health centre has newly constructed but not in use yet. The diseases treated in the community includes malaria, cold, dysentery, cholera, and typhoid fever, hernia, and malnutrition, etc. Now, this community rely on the health facilities at other communities like Fourah bay, Up-gun, that are close, and other further communities and traditional herbs for treatment of diseases. At least every home in this community is with a toilet facility, which include mainly of pit latrine toilets, but there are also evidences of some indoor and outdoor flush septic tank toilets, and many VIP toilets around. No evidence of open defecation reported. Accounting for HIV&AIDS, a health practitioner present at the Focus Group Discussion when probed, reported about an unknown figure of those living with the disease in the community. A confirmation of the presence of inhabitants living with the disease affirmed and with on the rise. One of the reasons for this is (as reported) the increase in the number of commercial sex workers, and the limited information available on the disease.

## **Transport and communication**

Like the rest of the urban city, Cline Town enjoys a 3G/LTE, Fibre connectivity, and 3.75G internet broadband communication system from SierraTel, SMART, Africell and Airtel respectively, Cell phone (wireless) communication system with higher bandwidth network reception, etc. In addition, there is an increased use of motor bikes and vehicles. Many people trek use motorbikes and cabs, which serve as some of the major ways of commuting in the city. The inhabitants easily move from Cline Town to other communities especially the very immediate ones (Kanikay, Seaside, Bankolay, and Moa Wharf) affected by NSBT operations. However, use of bikes have increased vulnerability to accidents some of which have resulted in permanent disabilities and fatalities.

## **Sociocultural reference point**

### **Customs and traditions**

At Cline Town community, there are secret societies for both women and men. Just like most other settlement in municipality, the main objective for initiating inhabitants into these secret societies is to help them transition from innocent and gullible teenagers to informed and robust leaders. The *Poros* is the main one for men while the *Bondo* is the main one for women. Each of these societies has its recruitment criteria that meet specific objectives. For example, the *Bondo* trains women to become great mothers and leaders; the *Poros*, *Sokobana*, etc. prepares men to become robust community people and leaders. From the inhabitants' response, no figure known or estimates of the number or percentage of men and women that are part of secret societies in the community.

Also, on the population of married and unmarried men and women that make up the community, the focus group reported, up to 25% of the men's population are considered married, and also about 30% of the women's population are considered married. It is a common practice for one man to marry multiple wives, as they help in doing house chores, bearing and taking care of children, and aiding on home financing by doing trade and other jobs. The respondents further probed that man and woman are considered married in this society if they have lived together in the same house as a household for at least two years or more.

## **Religion**

Muslims make up to 70% of the community, and Christians about 25%. There are about two Mosques in the community each with a capacity of about 200 men and 100 women. There are more than four churches in the community with two of these with capacity more than 200 congregation. African traditional religion are inter-woven between these two religions. This means the majority of Muslims or Christians also participate in the sacred traditional practices in the area.

## **Ethnicity**

The ethnic groups recorded in this study are Themne (70%), Limba (20%), and Mende, Madingo, Fula, and Susu, and others that make up the remaining 10% of the population. The Themne and Limba have most of the chiefs and traditional leaders. All the other tribes are in minority (5% or less) in terms of population.

## **Water supply and quality**

At Cline Town community, the supply of pure drinking water is an issue as from the survey. There are no hand pumps or wells in the community. The people only rely on and use the water provided by Guma Valley Water Company. They claimed that the community is already line with pipes for pipe borne water, but water does not flow through. They complained of frequent shortage and unclean supply of water for drinking and domestic uses.

## **Sources of Energy**

The people of Cline Town community depends on charcoal for cooking and food preservation. Few homes and households use gas cookers and refrigeration as a preservation method. They use the national power grid, rechargeable lanterns, and torchlights for heating, lighting the homes, and night trekking. The people also use diesel and petrol generators to light their homes and provide services like mobile charging centers, video cinemas, etc.

## **Sources of food**

The inhabitants are mainly freelance workers and labourers, with a mix of civil servants. Their source of food is from the daily or monthly wages. They mainly engage in the laborious work at the quay, bike riding, etc.

## **Education**

There are formal schools at the community that also serves other surrounding communities and settlements. There is only one school available at the community and this is an elementary school called the Bishop Crowther Primary School. The highest level of teacher education recorded at the community are High School graduates, Higher Teacher's Certificate and Bachelor of Science and Arts degrees. There are more than 400 school going boys and more than 600 school going girls at Cline Town. There are no Technical/Vocational Institutes or a higher learning centers in the community. Seekers of higher learning do not necessarily have to migrate to other communities in the Freetown municipality in that regard.

## **Vulnerability capacity and disaster risk**

According to the respondents, some of the vulnerabilities include the risk of teenage pregnancy as there are a lot of idle youths in the community, ageing or poorly constructed buildings as more than 50% of the homes observed are made of just zinc (*pambodi*), increase in noise pollution from the constant movement of truck and heavy duty vehicles. The community have developed resilience as the main coping strategy in addition to specific strategies for specific vulnerabilities over the years. The most common resilience is imposition of strict swimming laws in the community, migration from the affected area to a safer place in the community. Due to poor water treatment, citizens become vulnerable to diseases such as cholera and typhoid fever as the two-main diagnosed water borne diseases. It is not clear whether other diseases may prevalent owing to the lacking in equipment for diagnosis.

Finally, there are road accidents especially with bikes that leads to fatalities in most cases. Most of the drivers are young, inexperienced, and poorly trained. According to respondents, there have been cases of amputations, severe injuries, and even fatalities from motorbike accidents in and around the community. The presence of traffic law enforcement in this area lessens the likelihood of these road accidents. Fortunately, the community and its surrounding privileged with alternative and safer means of transportation other than trekking, which is slower.

### **Social groupings**

Local and outside groups of men and women exist in the community for helping one another in mostly economic, spiritual, and business activities. such groups that exist in Cline Town includes *Bethel Outreach* as one of the church groups, *Jamaltul Oothima* as one of the Islamic groups, Sisters United as one of the women's groups, *Wisdom Base*, *Shadow Family*, and *Black Combat* as some of the Youth groups for men, etc.

### **Trade and Commerce and income level**

Most of the inhabitants especially the women, engage in petty trading on the daily basis, where they buy and sell all sort of food stuff like fish, gari, palm oil, pepper, seasonings, spices, cereals, biscuits, and sweets; they also sell general supplies such as fishing hooks and linings, blades, lock and key, toiletries, school materials, and any other essential item. Probed further about income and expenditure, the surveyed people responded that in terms of income, they could raise at least a monthly amount ranging from SLL 500,000.00 to SLL 1,000,000.00 each from trade and wages/salary, and SLL 500,000.00 to SLL 1,000,000.00 from rent. In addition, in terms of expenditure, the participants reported that they could expend at a range from SLL 500,000.00 to SLL 1,000,000.00 each on food, education, health, transport, and other legal fees, etc. each month.

### **Perceptions and Expectations**

When probed in about their views on the proposed extension and the operations of NSBT, the participants responded that the proposed project is a beautiful idea and that it will and should consider the recruiting of youths especially from the community. They also added that the project would help employ some of the idle youths in the community and this would be a great boost for the community. Everyone present think that the project is beneficial and developmental, and if it were up to them to give a go ahead for operations, they literally would not have any objection to the project.

Surveyed further about the four most important community problems in Cline Town, the participants in their own words mentioned the high level of employment, lack of community schools especially a high school, lack of community medical center, and a high level of poverty and food insecurity in the community. They actually think that their income now as compared to three years ago is far worse, deteriorating as they think it is because of increase in the prices of commodity, and this has no control. They claimed that they spend more now on food and other things as compared to three years ago.

The local television and radio channels, the local press, postal and brochures, internet, and religious leaders' preaching, and from the neighbours are some of the ways that the community gain access to national news and news about Nectar Sierra Bulk Terminal, NSBT operations.

#### **4.4.2 Kanikay Wharf Community Focus Group Discussion (8.487945, -13.20465)**

##### **Population of community**

Kanikay Wharf is a small community too with a small population. The community is made of approximately 3,000 residents. It further has at least 0.29% of the Urban Metropolitan District population (Statistics SL. 2015). The other smaller communities close to Kanikay Wharf community are directly or indirectly affected by the quay operations, have populations 1% or less of the Urbanite population. Kanikay Wharf makes up to 0.42% of the national Population, Statistics SL 2015.

##### **Gender**

The community has more women (36.6%) than men (30%) and the children (33%). The respondents believe it is a natural tendency for the women to men ratio and is beyond human comprehension.

##### **Livelihood**

The inhabitants' livelihood activities are mainly boat transportation across the estuary, artisanal fishing, and trading, as they are mainly unskilled labourers. There are a few civil servants in this small settlement ranging from teachers to police, and health workers, etc. There are few commercial vehicle drivers, commercial boat sailors, and bike riders in the community.

##### **Health and sanitation**

This settlement lacks a functional health center and literally use the services of families and neighbours in times of medical complications. As investigated during the survey, this community suffered a lot during the nation's *Ebola* epidemic disease. There is no health center in this community. The diseases treated in the community includes malaria, cold, dysentery, cholera, and typhoid fever, hernia, and malnutrition, etc. Now, this community rely on the health facilities at other communities like Fourah bay, Up-gun, Ferry Junction, etc. that are close, and other further communities and traditional herbs for treatment of diseases. Many homes in this community lacks a toilet facility but the few observed include mainly of pit latrine toilets. There is an outdoor public flush VIP toilet with four doors. In the community that recently been constructed but not in use now? There is evidence of open defecation sighted in this community from the survey. The residences and rubbish deposited at the bay/wharf by the current serve as breeding ground for many disease carriers like mosquitoes. Especially on the wharf, open defecation is legal and the animals reared feed on all sort of rubbish and faeces, which in turn create room for many zoonotic diseases in the community. Accounting for HIV&AIDS, a health practitioner present at the Focus Group Discussion when surveyed, reported about an unknown figure of those living with the disease in the community. However, a confirmation of the presence of inhabitants living with the disease was affirmed and reported that it is on the rise. One of the reasons for this is (as reported) the increase in the number of commercial sex workers, and the limited information available on the disease.

##### **Transport and communication**

Like the rest of the Cosmopolitan and Metropolitan City of Freetown, Kanikay Wharf enjoys a 3G/LTE, Fiber connectivity, and 3.75G internet broadband communication system from SierraTel, SMART, Africell and Airtel respectively, Cellphone (wireless) communication system with higher bandwidth network reception, etc. In addition, there is an increased use of motor bikes and vehicles. A lot of people trek, use motorbikes and cabs, which serve as some of the major ways of commuting in the city. The inhabitants easily move from Kanikay to other communities especially the very immediate ones (Kissy Dock Yard, Cline Town, and others) affected by NSBT operations. However, use of bikes have increased vulnerability to accidents some of which have resulted in permanent disabilities and fatalities.

## **Sociocultural reference point**

### **Customs and traditions**

At Kanikay Wharf community, there are secret societies with members for both women and men. Just like many other settlement in municipality, the main objective for initiating inhabitants into these secret societies is to help them transition from innocent and gullible teenagers to informed and robust leaders. The *Poro* and the *Sokobana* is the main one for men while the *Bondo* is the main one for women. Each of these societies has its recruitment criteria that meet specific objectives. For example, the *Bondo* trains women to become great mothers and leaders; the *Poro*, *Sokobana*, etc. prepares men to become robust community people and leaders. From the inhabitants' response, 44.4% of men and less than 20% women are part of secret societies in the community.

Also, on the population of married and unmarried men and women that make up the community, the focus group reported, up to 61.1% of the men's population are considered married, and also about 72.7% of the women's population are considered married. It is a common practice for one man to marry multiple wives, as they help in doing house chores, bearing and taking care of children, and aiding on home financing by doing trade and other jobs. The respondents further probed that a man and a woman are considered married in this society if they have lived together in the same house as a household for at least two years or more.

### **Religion**

Muslims make up to 80% of the community, and Christians about 20%. There are about 5 Mosques in the community each with a capacity of about 100 men and 50 women. There are more than 3 churches in the community with 2 of these with capacity more than 200 congregation. African traditional religion are interwoven between these two religions. This means the majority of Muslims or Christians also participate in the sacred traditional practices in the area.

### **Ethnicity**

The ethnic groups recorded in this study are Themne (70%), Limba (20%), and Mende, Madingo, Fula, and Susu, and others that make up the remaining 10% of the population. The Themne and Limba have most of the chiefs and traditional leaders. All the other tribes are in minority (5% or less) in terms of population.

### **Water supply and quality**

At this community, the supply of pure drinking water is an issue as from the survey. There are no hand pumps or wells in the community. The people rely on and use the water provided by Guma Valley Water Company. They claimed that some parts of the community are gates way to underground pipelining for water hydrants and electrical networking. They complained of frequent shortage and unclean supply of water for drinking and domestic uses.

### **Sources of Energy**

The people of Kanikay community depends on charcoal for cooking and food preservation. Few homes and households use gas cookers and refrigeration as a preservation method. They use the national power grid, rechargeable lanterns, and torchlights for heating, lighting the homes, and night trekking. The people also use diesel and petrol generators to light their homes and provide services like mobile charging centers, video cinemas, etc.

### **Sources of food**

The inhabitants are mainly freelance workers and laborers, with a mix of civil servants. There is no land available to engage in agricultural practices even on subsistence scale. They get food items from the market that are being brought in from the Provinces and villages, and other Urban and Peri-Urban agricultural settlements like Waterloo, the mountain villages, etc. Their source of food is from their daily or monthly wages. They mainly engage in the laborious work at the quay, bike riding, on sea transportation, etc.

### **Education**

There are formal schools at the community, but they are mainly elementary schools that also serve other surrounding communities and settlements. There are two elementary schools available at the community; they are; Sierra Leone Muslim Brotherhood Primary School and the Bishop Crowther Primary School. The highest level of teacher education recorded at the community are High School graduates, Higher Teacher's Certificate and Bachelor of Science and Arts degrees. There are more than 280 school going boys and more than 400 school going girls at the community. There are no Technical/Vocational Institutes or a higher learning centers in the community. Seekers of higher learning do not necessarily have to migrate to other communities in the Freetown municipality in that regard.

### **Vulnerability capacity and disaster risk**

According to the respondents, some of the vulnerabilities include the risk of teenage pregnancy as there are a lot of idle youths in the community, ageing or poorly constructed buildings as more than 70% of the homes observed are made of just zinc (*pambodi*), increase in noise pollution from the constant movement of truck and heavy duty vehicles. The community have developed resilience as the main coping strategy in addition to specific strategies for specific vulnerabilities over the years. The most common resilience is the imposition of strict swimming laws in the community, reduce child labor, etc. another resilience strategy is engaging in something to do to be able to take care of one's self and his/her family and reduce household poverty level. Due to poor water treatment, citizens become vulnerable to diseases such as cholera and typhoid fever as the two main diagnosed water borne diseases. It is not clear whether other diseases may prevalent owing to the lacking in equipment for diagnosis. They boil water to soften it and make it fit for consumption especially for kids. The municipality is now collecting the sewage and refuse.

Finally, there are road accidents especially with bikes that leads to fatalities in most cases. Most of the drivers are young, inexperienced, and poorly trained. According to respondents, there have been cases of amputations, severe injuries, and even fatalities from motorbike accidents in and around the community. The presence of traffic law enforcement in this area lessens the likelihood of these road accidents. Fortunately, the community and its surrounding where privileged with alternative and safer means of transportation other than trekking, which is slower.

### **Social groupings**

There are local groups of men and women that exist in the community for helping one another in mostly economic, spiritual, and business activities. At the Kanikay Wharf Community, the social groups that exist includes *Alumu-Althahida Muslim Jamaat* as one of the Islamic groups, SABU as one of Youth groups, etc. There are also groups of secret societies, both for men and women.

### **Trade and Commerce and income level**

Very similar to other surrounding communities' trade and commerce for most inhabitants at Kanikay Wharf especially the women engage in petty trading on daily basis, they also sell general supplies such as fishing hooks and linings, blades, lock and key, toiletries, school materials, and any other essential item. Probed further about income and expenditure, the surveyed people responded that in terms of income, they could raise at least a monthly amount ranging from SLL 500,000.00 to SLL 1,000,000.00 each from trade and

wages/salary, and SLL 500,000.00 to SLL 1,000,000.00 from rent. In addition, in terms of expenditure, the participants reported that they could expend at a range from SLL 500,000.00 to SLL 1,000,000.00 each on food, education, health, transport, and other legal fees, etc. each month.

#### **Fishing Specific:**

The 30 fishermen of Kanikay Wharf engage in on-water fishing as they do not have any fishing ground. They fish individually and do so, to get a source of protein and feed the family. Most of the fishermen had fished since childhood. They use fishing lines and small paddleboats, as they do not have the right gears to engage in the fishing activity on a business basis. They do not use nets or chemicals for fishing as they cannot afford them. There has been a reduction in the catch level as compared three years ago. The Ebola epidemic did obstruct a lot of things and activities like the community artisanal fishing activity, as gathered from the survey.

#### **Perceptions and Expectations**

Talking about the proposed extension and the operations of NSBT, the participants responded that they are happy about the proposed project and that it will consider the recruitment of youths especially from the community. They also added that the project would be a great boost for the community. Everyone present think that the project is beneficial and developmental, and if it was up to them to give a go ahead for operations, they literally would not have any objection to the project.

Surveyed further about the four most important community problems, the participants in their own words mentioned the high level of employment, lack of community schools especially a high school, lack of community medical/health center, and a general development of the community. Probed about the difference in their income now as compared to three years ago, and the response was that, it is far worse now and deteriorating every day and year. They think it is as a result of increase in the prices of commodity and this has no control. They claimed that they spend more now on food and other things as compared to three years ago. The local television and radio channels, the local press, postal and brochures, internet, and religious leaders' preaching, and also from the neighbors are some of the ways that the community gain access to national news and also news about Nectar Sierra Bulk Terminal, NSBT operations.

#### **4.4.3 Seaside-Lower Savage Square and Bay Community Focus Group Discussion (8.491045, - 13.214508)**

##### **Population of community**

Seaside-Lower Savage Square Community is another small community with a small population. The community made up of approximately 4,000 residents. It further has at least 0.38% of the Metropolitan District population (Statistics SL. 2015). The other smaller communities close to Seaside-Lower Savage Square Community, which directly or indirectly affected by the quay operations, have populations 1% or less of the Urbanite population. Seaside-Lower Savage Square Community makes up to 0.06% of the national Population, (Statistics SL 2015).

##### **Gender**

The community has more women (45%) than men (30%) and the children (25%). The respondents believe it is a natural tendency for the women to men ratio and is beyond human comprehension. In addition, some reflected to the past civil war that more men were killed than women and children.

##### **Livelihood**

The inhabitants' livelihood activities are mainly boat transportation across the estuary, artisanal fishing (especially near the bay), and trading as they are mainly unskilled labourers. There are a few civil servants

in this small settlement ranging from teachers to police, and health workers, etc. There are few commercial vehicle drivers, commercial boat sailors, and bike riders in the community.

### **Health and sanitation**

This settlement and bay just surrounds a functional health center and literally use the services of this center that offers health services to both women and children. The Ola during Children's Hospital (8.490254, -13.218987) provides health services to children only, and the Princess Christian Maternity Hospital, PCMH (8.489861, -13.219349) provide health services to pregnant women only. Families and neighbors in times of medical complications. As investigated during the survey, this community suffered a lot during the nation's *Ebola* epidemic disease. There is no health center in this community. The diseases treated in the community includes malaria, cold, dysentery, cholera, and typhoid fever, hernia, and malnutrition, etc. At the moment, this community rely on the health facilities at other communities like immediate Moa Wharf, Fourahbay, Bankolay, etc. that are close, and other further communities, and traditional herbs for treatment of diseases. Many homes in this community (especially those at the Seaside bay and Moa Wharf), lack toilet facilities but the few observed in the Lower Savage Square community include mainly of pit latrine toilets, and a few interior flush toilets. From observation from the bay stretching to Moa Wharf, there is evidence of open defecation sighted in that part of the community. The residences and rubbish deposited at the bay/wharf by the current serve as breeding ground for many disease carriers like mosquitoes. Especially on the wharf, open defecation is legal and the animals reared feed on all sort of rubbish and faeces, which in turn create room for many zoonotic diseases in the community. From the surveying process, individual visits made at the PCMH and at Ola During to account for the level of HIV/AIDS in the community. The in-charges responded that the hospital literally serve the whole of the city and would be difficult to give exact figures pointing directly to just Lower Savage Square, and Seaside Community to be precise.

### **Transport and communication**

Just like the entire City of Freetown, Seaside-Lower Savage Square Community enjoys a 3G/LTE, Fiber connectivity, and 3.75G internet broadband communication system from SierraTel, SMART, Africell and Airtel respectively, Cellphone (wireless) communication system with higher bandwidth network reception, etc. In addition, there is an increased use of motor bikes and vehicles. A lot of people trek, use motorbikes and cabs, which serve as some of the major ways of commuting in the city. The inhabitants easily move from the community to other communities especially the very immediate ones (Fourahbay, Moa Wharf, Cline Town, and others) affected by NSBT operations. However, use of bikes have increased vulnerability to accidents some of which have resulted in permanent disabilities and fatalities.

### **Sociocultural reference point**

#### **Customs and traditions**

At Seaside-Lower Savage Square Community, there are secret societies with members for both women and men. Just like many other settlement in the municipality, the main objective for initiating inhabitants into these secret societies is to help them transition from innocent and gullible teenagers to informed and robust leaders. The *Poro* and the *Sokobana* is the main one for men while the *Bondo* is the main one for women. Each of these societies has its recruitment criteria that meet specific objectives. For example, the *Bondo* trains women to become great mothers and leaders; the *Poro*, *Sokobana*, etc. prepares men to become robust community people and leaders. From the inhabitants' response, no estimated percentage of either men or women that are part of these secret societies declared.

Also, on the population of married and unmarried men and women that make up the community, the focus group reported, up to 83.3% of the men's population are considered married, and also about 66.7% of the women's population are considered married. It is a common practice for one man to marry multiple wives, as they help in doing house chores, bearing and taking care of children, and aiding on home financing by doing trade and other jobs. The respondents further probed that a man and a woman are considered married in this society if they have lived together in the same house as a household for at least two years or more.

### **Religion**

Muslims make up to 70% of the community, and Christians about 30%. There are about 3 Mosques in the community each with a capacity of about 100 men and 50 women. There are more than 3 churches in the community with 2 of these with capacity more than 200 congregation. African traditional religion is interwoven between these two religions. This means the majority of Muslims or Christians also participate in the sacred traditional practices in the area.

### **Ethnicity**

The ethnic groups recorded in this study are Themne (70%), Limba (20%), and Mende, Madingo, Fula, and Susu, and others that make up the remaining 10% of the population. The Themne and Limba have most of the chiefs and traditional leaders. All the other tribes are in minority (5% or less) in terms of population.

### **Water supply and quality**

At this community, the supply of pure drinking water is an issue as from the survey. There are no hand pumps or wells in the community. The people rely on and use the water provided by Guma Valley Water Company. They also claimed that some parts of the community is already lined with pipes for pipe borne water, but water does not flow through. They did not complain of frequent shortage or any unclean nature of supply of water for drinking and domestic uses. They have three 10,000-liter tanks at strategic locations in the community for supply purpose.

### **Sources of Energy**

The people of this community depends on charcoal for cooking and food preservation. Few homes and households use gas cookers and refrigeration as a preservation method. They use the national power grid, rechargeable lanterns, and torchlights for heating, lighting the homes, and night trekking. The people also use diesel and petrol generators to light their homes and provide services like mobile charging centers, video cinemas, etc.

### **Sources of food**

The inhabitants are mainly freelance workers and laborers, with a mix of civil servants like nurses, police, teachers, etc. There is a small piece of land available to engage in agricultural practices especially vegetable production on subsistence scale. The inhabitants at the Seaside bay area engage in this activity. However, they get food items from the market that are being brought in from the Provinces and villages, and other Urban and Peri-Urban agricultural settlements like Waterloo, the mountain villages, etc. Their financial source of food is from their daily or monthly wages. They mainly engage in the laborious work at the quay, bike riding, on sea transportation, or civil services, etc.

### **Education**

There are formal schools at the community, starting from elementary to High School, and even higher education institution that serve the community and other surrounding communities and settlements. There is one Kindergarten School (Aunty Mem's Pre-School), three primary schools (Aunty Mem's, Eastern Municipal, and Cathedral Primary Schools). There are three high schools available at the community (Bishop Johnson, Cambridge, and Federation Secondary Schools); they is also the Fourahbay Technical / Vocational for School leavers that do not make it to colleges/Universities. The highest level of teacher

education recorded at the community are High School graduates, Higher Teacher's Certificate and Bachelor of Science and Arts degrees. There are more than 800 school going boys and more than 800 school going girls at the community. Seekers of higher learning do not necessarily have to migrate to other communities in the Freetown municipality in that regard.

### **Vulnerability capacity and disaster risk**

According to the respondents, some of the vulnerabilities include the risk of teenage pregnancy as there are a lot of idle youths in the community, ageing or poorly constructed buildings as more than 70% of the homes observed are made of just zinc (*pambodi*), increase in noise pollution from the constant movement of truck and heavy duty vehicles. The community have developed resilience as the main coping strategy in addition to specific strategies for specific vulnerabilities over the years. The most common resilience; reflects on the imposition of strict swimming laws in the community. Migration from the affected tidal areas to a safer place in the community, making sure every kid goes to school to reduce child labour, etc. another resilience strategy is engaging in something to do to be able to take care of one's self and his/her family and reduce household poverty level. Due to poor water treatment, citizens become vulnerable to diseases such as cholera and typhoid fever as the two-main diagnosed water borne diseases. It is not clear whether other diseases may prevalent owing to the lacking in equipment for diagnosis. They boil water to soften it and make it fit for consumption especially for kids. The municipality is now collecting the sewage and refuse.

Finally, there are road accidents especially with bikes and vehicles that leads to fatalities in most cases. Most of the drivers are young, inexperienced, and poorly trained. According to respondents, there have been cases of amputations, severe injuries, and even fatalities from motorbike accidents in and around the community. The presence of traffic law enforcement in this area lessens the likelihood of these road accidents. Fortunately, the community and its surrounding are privilege with alternative and safer means of transportation other than trekking, which is slower.

### **Social groupings**

There are local groups of men and women that exist in the community for helping one another in mostly economic, spiritual, and business activities. Savage Square Community have the existence of Churches with social groups. Limba-Pentecostal, United Methodist Church group, *etc.*, the Bilal Muslim Jamaat as one of the Islamic groups, some of the women's groups include Girl to Girl Empowerment group, Women in Development, Tawopaneh/Tamaraneh Development group, *etc.*, and the Youth groups include the Seaside Community Youth aorganizatio, Seaside Community Youth Organization, and the Youth Yearns Development Organization, *etc.* There are also groups of secret societies, both for men and women and include the Orjeh, Hunting, Jorley, Bondo, Poro, Soko, Ordeleh, *etc.*

### **Trade and Commerce and income level**

Very similar trade exist like in the surrounding communities. Trade and commerce depicts the inhabitants' survival at Seaside-Lower Savage Square Community, especially the women who engaging in petty trading. They also sell general supplies such as fishing hooks and linings, blades, lock and key, toiletries, school materials, and any other essential item. Probed further about income and expenditure, the surveyed people responded that in terms of income, they could raise at least a monthly amount ranging from SLL 500,000.00 to SLL 3,000,000.00 each from trade and wages/salary, and SLL 500,000.00 to SLL 9,000,000.00 from rent. In addition, in terms of expenditure, the participants reported that they could expend at a range from SLL 500,000.00 to SLL 5,000,000.00 each on food, education, health, transport, and other legal fees, *etc.* each month.

### **Fishing Specific**

The 40 fishermen of Seaside-Lower Savage Square bay Community engage in on-water fishing as they do not have any fishing ground. They fish individually and do so, to get a source of protein and feed the family. Most of the fishermen had fished since childhood. They use fishing lines and small paddleboats, as they do not have the right gears to engage in the fishing activity on a business basis. They do not use nets or chemicals for fishing, as they cannot afford them. There has been a reduction in the catch level as compared three years ago. The Ebola epidemic did obstruct a lot of things and activities like the community artisanal fishing activity, as gathered from the survey.

### **Perceptions and Expectations**

Talking about the proposed extension and the operations of NSBT, the participants responded that they are happy about the proposed project and that it will consider the recruitment of youths especially from the community. They also added that the project would be a great boost for the community. Everyone present think that the project is beneficial and developmental, and if it were up to them to give a go ahead for operations, they literally would not have any objection to the project.

Surveyed further about the four most important community problems, the participants in their own words mentioned the high level of employment, lack of community schools especially a high school, lack of community medical/health center, and a general development of the community. Probed about the difference in their income now as compared to three years ago, and the response was that, it is far worse now and deteriorating every day and year. They think it is because of increase in the prices of commodity and this has no control. They claimed that they spend more now on food and other things as compared to three years ago. The local television and radio channels, the local press, postal and brochures, internet, and religious leaders' preaching, and from the neighbours are some of the ways that the community gain access to national news and news about Nectar Sierra Bulk Terminal, NSBT operations.

## **4.4.4 KEY INFORMANT INTERVIEWS RESULT/STAKEHOLDER CONSULTATION**

Key Stakeholders that are directly involved with the operations of the Ports were interview on their views regarding the proposed extension of the Bulk Terminal by NSBT. Below are the key stakeholders in consultation.

➤ **Mr. Sallu Deen;**

Head of Operations,

Port Health, Ministry of Health and Sanitation.

Contact:

**Primary Port Mandate:** Responsible to check and cross-examine the health status of every berthed vessel and crew. Disinfect and transfer any sick crew for medical treatment.

➤ **Mr. Raymond Sannoh;**

Environmental Manager,

Sierra Leone Ports Authority.

Contact:

**Primary Port Mandate:** His unit conducts environmental audits of the port and mainly responsible for the security and safety of the environment at the ports.

➤ Mr. Mohamed Osman Bah; Manager;  
Manager, Destination and Landing Inspections,  
Sierra Leone Standards Bureau

Contact:

**Primary Port Mandate:**

Undergo conformity assessments of all imports and exports, both food and non-food items. Collects, tests, and analyse samples for assessment in 48 hours of vessel berthing. They set the standards of food and non-food items entering or leaving the country. They are at all entry points of trade in the country.

**Key Findings:**

All the Stakeholders consulted have knowledge about the proposed extension of the current bulk terminal and warehouse by NSBT. Such knowledge been gained from friends or official, as they are all directly involved with Ports operations. Regarding individual sentiments about the benefits of the proposed project, all the above stakeholders strongly think and agree that the said project would be a great opportunity for themselves (as it brings in more work, challenges, and experience in their operations at the port). The project will influence the affected communities and the country in general through mobilization of substantial aid and the creation of jobs. Bringing in income and foreign exchange, it will change the environment's facelift from the sea point of view, enlarge the Port capacity and operations, brings in more goods and investments, and standardizes the Ports and operations, as this is one of the goals of the Port to become a container hub in the sub region.

Concisely, the main issue they pointed out is for the proposed project to set standards and precedence as initiated by the ongoing NSBT operations at the quay. Standards and precedence as in the import and export of standard goods, meeting every financial obligation, and standard work ethics as it is happening now. They also crave for better capacity building of fellow Sierra Leoneans and better induction training to solve hectic operational problems. They look forward to NSBT abiding by all best practices of both national and international standards.

**Research/Study constraints:**

The researchers faced a number of constraints on the field especially during the data collection. There include;

1. The research/survey conducted during the raining season. It rained intermittently during the survey period and this made it difficult for the researchers to move around and gather participants for the discussions and scheduling the key stakeholder consultation.
2. Many organizational bureaucracies made it difficult for the researchers to schedule the key informant consultations. There were supposed to be four (4) key informant consultations made, but only three were for reporting.

**Socioeconomic Impacts**

**Positive Impacts**

It anticipated that the proposed project will result in improved welfare in the form of increased economic activity, improved infrastructure, employment creation, and improved air quality.

### **Increased economic activity**

The anticipated increase in the flow of money will create a suitable environment for micro and small-scale enterprises in the nearby communities and the nation as a whole.

### **Employment creation**

The project will create employment at inception, construction and operational phases as follows:

- During inception, consulting team are commission to undertake services such as engineering and architectural design, land and quantity survey, environmental impact assessment and development of procurement specifications. At the construction stage, many technical Sierra Leoneans employed as site engineers, technicians and equipment operation personnel alongside tens of unskilled workers. At this stage, professional services would also be required for contractor supervision.
- On commissioning of the project, Nectar Sierra Bulk Terminal, NSBT expect to hire additional staff to manage the new bulk terminal. This would create additional jobs in engineering, operations, warehousing management, and administration. Increased operations would also require additional support personnel in security and accounts. This will address the unemployment problem in the short-term and will trigger more economic activity since demand for goods and services will increase. Once the construction phase is completed and the volume of business increases, employment opportunities are influence; through the linkage effects especially in the area of road transport since more trucks may have to come in to clear the containers from the newly extended container terminal.

### **Reduction in Container Traffic Accidents**

The proposed project would result in decongestion of the existing bulk terminals. In view of the anticipated expansion project would help create access for the ease of NSBT vehicles operation and machineries and traffic flow.

### **Displacement**

No residential community Structures are to be affect by the operation of the project. No households need relocation.

### **Negative Impacts**

On the negative, it is in anticipation that the project will result in noise and dust production during construction and behaviour change.

### **Behaviour change**

It anticipated that during the process phase, a number of expert workers would be employ on a contract bases at the site. These strides will create demand by local staff to match with their technological skills which most times will demand additional time in work. Health issues could also be a threat on both sides as workers needs to monitor on their disease morbidity, and expenditure so that there would not be over classism in the work that could suppress other staff.

### **Mitigation Measures for Socio-economic Impacts**

Based on the results of the study, the following mitigation measures shall be undertaken:

- Measures shall put in place to minimize off-site effects of the construction activities. Noise and dust will be a nuisance during construction phase. Dust would be minimize by watering the dusty areas at the

construction site, while construction activities would be limited to day hours in the neighbourhood of residential areas.

- NSBT shall promote health awareness campaigns to sensitize local residents about the dangers of having a number of migrant workers at the project site especially during the construction phase.

## **CHAPTER FIVE**

### **5.0 NSBT PROJECT ALTERNATIVE AND MANAGEMENT**

#### **5.1 Project Alternatives**

Alternatives have been sets' to either reduce negative environmental impacts or enhance positive environmental impacts of NSBT investment.

##### **5.1.1 Site and activity alternatives**

Alternative sites at which this activity could be located depends on the availability of land tender by SLPA and SLPMC, with considerations on fringe effect by neighbouring companies like the Leocem(SL)Ltd and Flower mill(SL)Ltd with relevant to the general operations of the company. NSBT engineering team still assessing the need for alternative sustainable power systems with low effect on emission/radiation or absolute energy transfer. Increase generator load and power rating could be associate with noise and liquid effluent drains; which could course damage to the surrounding environment. Therefore, in anticipation to safety and environmental regulations like ISO 14001 and ISO9001; the company will have to maintain its high quality purchasing of machineries and fittings for the prevention of negative footprints.

NSBT has committed to adopting environmentally friendly approaches in its operational process in order to minimize noise and waste. Standard operating procedures could also be enhance by collaboration and training of staff, introduction of new monitoring tools for failures of storage conditions and bulk discharge. Developing marketing strategies that combine meeting demands and maintaining standards in for its customers.

##### **5.1.2 Design alternatives**

The design objective for the extension of NECTAR GROUP as key associate with NSBT takes into account the following: minimize pollution and prevent accidental risk occurrence within work premises. Management of external environmental threats to establishment of the existing infrastructure and new design in plan, develop effective and efficient waste management system, enhance ideal technological transfer, and promote Climate Change policies within the concession area and its surrounding.

##### **5.1.3 Description of Alternative Designs**

Alternative designs could effects; as a solution for any virtual/ immediate impact as thought to conflict management and risk exposure management. Therefore, this required a follow-up by construction engineer to relate guidelines and merged into SPMC and SLPA infrastructures. From the background study of the site, approaches towards alternative operation designs should indicate the following:

- I. Minimization of environmental impacts including, noise, odour and aspect;
- II. Optimum capital and running costs;
- III. Utilization of more local and international service personnel, with level technical experience from harbour operations and shipping regulations.
- IV. Environmental Clean-up programs as cooperates responsibility
- V. Land area engineering design and environmental beautification requirements.

However, retrospective stands on different options as to how the additional facility could be develop. These can include, for example, management of emissions, aesthetic pollution control, and traffic. However, note; there has been consideration of environmental factors, which can influence the new options of NSBT project.

## **5. 2 ANTICIPATED ENVIRONMENTAL IMPACT AND MITIGATION MEASURES**

### **5.2.1 Value Environmental Component**

Significant environmental impacts of the proposed NECTAR investment in NSBT activity considered to have influence on socio-economic and physical environmental components including, soil and atmospheric environment. With extent to alternative delineations, mitigation strategies in prospect can develop for the most significant Valued Environmental Components (VECs). Each VEC has its own matrix line of management. Under the following headings: brief description, options for mitigation of potential environmental impact(s), and detailed management scheme. Details of these descriptions will form a chapter in the Environmental and Social Management Plan (ESMP).The matrix below presents VECs and the level of concern based on the type of project activity. The green shading indicates no significant environmental concern. There is no expected direct environmental impact. The yellow shading indicates some direct environmental impact but not requiring mitigation. They are issues that could be reversible or require no major technology for mitigation. Those in red are of significant environmental concern. The ESMP focuses on developing strategies and treatment design for sustainable management of these issues.

**Figure 8: Valued Environmental Components and their concern levels**

VECs Activities of/resulting from the project	Groundwater/surface water	Socioeconomic	Climate	Soil erosion & drainage	Historical foot print	Radiation	Fauna	Public health	Youth development	Aesthetics	Maintenance dredging
Land preparation and clearing of debris	Red	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Green	Green	Yellow	Yellow
Increased traffic	Green	Green	Yellow	Green	Green	Yellow	Yellow	Green	Green	Yellow	Yellow
Economic activity	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Employment of locals	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Waste disposal	Red	Yellow	Yellow	Red	Green	Yellow	Yellow	Red	Yellow	Red	Yellow
Greenhouse gases emission	Green	Green	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Red	Yellow

The colour depiction shows:

1. Green colour  depicts less associated impact with affordable management
2. Yellow colour  depicts slightly associated impact with option for management
3. Red colour  depicts sever concerns to management

### 5.3 Environmental Assessment of Land Take and Site Selection

#### 5.3.1 Brief description

Since colonial era, the country had its recognition for its natural harbour and has it management through an established National Port Agency known as SLPA. The quay is situated on the coordinates of (N-829'38.61, 829'38.60 and W- 1312'36.97, 1312'36.05). Within the terrain under review, NSBT is occupying its concession from the parent mapping of Port Authority concessional land. The land use before and present has not being altered either but has faced transformation from activity engagement to engineering design. The project area is ideally located taking into consideration the accessibility the scope or goal of NSBT in Sierra Leone.

### **5.3.2 Impact**

There is concern that the selected site is home to a wide range of overlap by companies on a hilly terrain. Which activities on land load and storage could transcend on resonance effect to NSBT at lower gradient. A situation like Leocem and Flower mill has obvious interaction with surrounding air per advection flow downhill.

### **5.3.3 Mitigation**

There has been a general site plan for the company's operation. It is therefore important that NSBT prepare a Site Layout Plan for display at its quarters and distribution to stakeholders. Generally, companies are required to be located. In a way to minimize visual, dust, and noise impacts on adjacent areas. The NSBT shall continuously waters surrounding soil plan and install inner-extractors for the removal of any dust on air, including ACs in cause of maintaining clean environment. The company shall continue using state of art machines like the previous generator in use. However, the administrative blocks are all within working premises so the use noise and light band reduction glasses are recommended for the safety and effective work services.

### **5.3.4 Air Pollution: Noise, Dust and Fumes**

### **5.3.5 Brief Description and Impact**

The mobilization of equipment and machinery at the project site, and the handling of bulk cargoes for customers and company operations will result in increased noise, vibration and slightly dust levels at the project site. The international standards for noise limit for daytime operations in an industrial or commercial zone is 70db.

It was recognized that majority of NSBT machines are within the set calibration of ISO, IEC and National Factory Safety standards. However, any lapses on maintenance could result into failures that might lead into liquid spills, electrocution, thermal hysteresis and excess vibration and beats frequency that will result into negative resonances.

### **5.3.6 Mitigation**

The following recommendations have made to manage the potential noise and dust impacts during machinery operations and some construction phase of the project:

1. Ensure all equipment are properly fitted with muffler devices and enclosure walls and are in good working condition
2. Schedule and selectively appoint and inform staff on time for environmental clean-up activities and peak operational hours.
3. Extended operating hours should require the permission of factory inspectorate, through regular submission of supporting noise monitoring reports and/or consultation with affected neighbours.

4. Communicate the hours of any construction activity to the nearby community through signage and Local radio broadcast.
5. Create natural sheds of trees around 7.2m to have a topographical feature that could provide the most effective 'in line' reduction of sound levels. Reliance on a barrier of vegetation for a marginal reduction in noise levels through the natural sinks.
6. As much as possible, NSBT should involve national engineers in their infrastructural projects for sharing of technical taught.
7. Ensure all workers are properly equipped with protective gears.
8. Ensure the generator is located downwind of facilities.
9. Access tracks and haul roads should be well maintain, to prevent corrugation that contributes to truck noise.

## **5.4 Road Traffic**

The effects of traffic density and traffic noise associated with the Quay operates on transport of goods from the port harbour to various destinations could have a significant impact on nearby offices. Nevertheless, the NSBT Project East part of the port area, it could face moderate traffic density that could lead to the possible congestion on work way and machinery roads.

### **5.4.1 Mitigation**

Furthermore, the condition of vehicles to be use by NSBT will be of roadworthy (including fittings with appropriate muffler devices) and set to operate by licensed operators, loaded and driven with care. Nevertheless, operating machines should not carry beyond their load limits and the materials should be pack accordingly in way to minimize the risk of accidents as best as possible.

## **5.5 Aesthetics and Visual Impacts**

### **5.5.2 Brief Description and Impact**

Visibility or Clear viewing is the requirements of plant and animal, NSBT could experiences cost increase on clean-ups and health impact of its workers by any excess exposure of food dust and dust settlers in the atmosphere. Though it has not indicated in the process of scoping, it must by pay keen attention to.

The nature and structure of infrastructure (buildings, access roads etc.), site layout and production activities within the project area may change the aesthetics. However, the current site is particularly shaded from public view by fences.

The visual impact of NSBT project at the Queen Elizabeth II Quay would be an influence influenced by:

1. The size of the area exposed;
2. The orientation of the site in regard to general accessibility and vantage points;
3. The visual contrast between the NSBT buildings and the surrounding area;
4. The distance of the machinery operations and on authorize personnel.
5. The perceived aesthetic value of the area.

### **5.5.3 Mitigation**

The following are recommendations:

1. NSBT to encourage environmental beautification on natural vegetation as a valuable resource that support pollutant adsorptions and preventing excess doses on workers and possible water bodies.
2. Vegetation on appropriate areas may needlessly be destroy by temporary activities.
3. Where practical, working faces should be oriented away from vantage points and neighbours and the direction of working should be carefully chosen so that that the working face is hidden from the most critical view.
4. Access tracks and haulage roads must be on paint by either Red, Green or Yellow depending on the criteria intended to meet.

## **5.6 Waste Management**

### **5.6.1 Brief Description and Impact**

Improper disposal of waste materials from operation activities could lead to pollution and degradation of the environment, particularly downslope environment such as aquatic bodies. Project activities are expect to produce both liquid, solid and gaseous wastes, though some released within required standards like gaseous waste, so main criteria waste could be solid and liquid. Which, if not properly managed, can lead to pollution of the area, or accumulate on the site creating an unhygienic and aesthetically poor environment, which can evolve into breeding grounds for disease causing insects and rodents.

The main sources of waste in anticipation on the propose activities will be solid waste from demolition, sweeps/ clearing with limited extent on waste oils, lubricants, paints and solvents for maintenance at some stage the clearing of areas for easy access of operation. The amount of such waste is expected to be limited and localized and as such does not pose a significant adverse impact. The operational phase will covers studies on Sustainable Solid Waste Management (SSWM) and Quality Assurance (QA) program at all levels.

### **5.6.2 Mitigation**

The following mitigation actions are required:

Fuel, lubricants, coolant, waste oil and waste chemicals must be stored in an approved manner such as in drums/ polyvinyl materials of high density or surface tanks with impervious bunds to contain spillage, and located away from operating areas and drainage lines. Specifications for storage will depend on the quantity, frequency of disposal and class of the material being stored. International Standards apply to the handling of High Risk Waste (HRW) materials that may be stored at a mine site. As these, reduce the risk of ground and surface water contamination. Bund walls and drainage continuity will be key in design profile of NSBT engineering framework.

Where possible the complete use of 3Rs and Waste paradigm systems could be apply with alternative inter-cooperation with Local Waste Collectors for an acceptable disposal of waste.

Solid waste management will include adequate plans for streaming between the source, reservoir and sink. Placement of garbage receptacles at strategic locations within NSBT project site,

including administrative building, Stores, Maintenance store, Training room and the propose NECTAR buildings. Health and safety management staff ensure the collection of garbage every morning, sort and package for submission to the main waste collection unit in the area. NSBT staff always separate their waste into coloured bins to facilitate sorting of waste materials according to metals, plastics, papers and food left overs. NSBT as main proponent will implement a monitoring program to understand quantitation of its waste generated.

## 5.7 Socio-environmental Concerns and mitigations

**Table 14: Socio-environmental concerns**

Concerns	Issue of public interest	Typical expectation/suggestion	Integrate into ESMP
Social and cultural	Settlement expansion on the south hill of the site	Engage all stakeholders, government, traditional leaders, landowners, locals, etc., in dialogue on land use practices and environmental protection.	√
	Uninvited visitors (thieves, social solicitation), visitors and retailers and Wholesalers	Services for site security codes of ethics, strengthening quality control systems for effluents discharge if it becomes a major source of pollution for neighbouring communities and grievance solving mechanism.	√
	Interested parties: potential employees, schools, local government, neighbouring landowners, market women, potential buyers and suppliers	High expectation of cooperate social responsibility. Employment of youth in the area, provision of amenities, collaborations, etc.	√
Economic	Economic gratification for community	NSBT brings employment for youth and women; there will increase of train locals on new cargo and harbour operations	√
Environmental	Concerns that the investment will bring machines and other forms and principles that could occupy space for other port users	Minimal dust and moderate to slight earth vibration will effects neighbouring property, construction issues, impact on vantage and waste transport	√

## **5.8 Possibility for maintenance dredging and Mitigation**

Exacerbating the erosion caused by storms are wharfs and breakwaters that redirect the natural flow of sand away from the shore, thus depriving beaches of natural sources of nourishment. Their task is to balance economics with the safety of such environmental resources as reefs, hard bottoms, and the other habitats of aquatic animals and plants. Adding to that continually growing list of factors is the safety of threatened or endangered species themselves: manatees, turtles, and various types of fish. Consideration of all these factors has resulted NSBT in modifying the methods of dredging and periods that could be accomplish with minimal environmental impact.

### **Critical loss Management**

A self-inspection program should be in place, wherein machinery spaces and other hazardous areas should regularly inspect in an attempt to identify and correct potential sources of accident and other risk, such as those listed above.

A hot Work policy should be established for controlling any hot work, such as arc welding or torch cutting. This policy should identify and confirm:

- What types of activity is considered hot work.
- Who has the authority to authorize hot work
- What procedures must be followed before hot work can be authorized

Human accidental management could be mostly emphasise to the use of PPEs when at work.

## **CHAPTER SIX**

### **6.0 ENVIRONMENTAL MANAGEMENT PLAN (EMP)**

#### **General**

This chapter should comprehensively present the Environmental Management Plan (EMP), which includes the administrative and technical setup, summary matrix of EMP, the cost involved to implement the EMP, both during the construction and operational phases. In practice, mitigation is emphasize in the EIA process following impact identification and prediction, and recommended measures will be an important part of the EIA report. These measures will be incorporated into the terms and conditions of project approval and implementation during the Environmental management stage of the EIA process. The objectives of environmental management are to:

- Ensure the mitigation measures are implemented
- Establish systems and procedures for this purpose
- Monitor the effectiveness of mitigation measures and
- Take any necessary action when unforeseen impact occur

## 6.1 Components of EMP

The EMP should contain the following:

- Summary of potential impact & proposed mitigation measures. Allocation of resources and responsibilities for implementation
- Administrative and technical setup for management of environment institutional arrangements proposed with other organizations/Govt. authorities for effective implementation of environmental measures proposed in the EIA
- Safe guards/mechanism to continue the assumptions/field conditions made in the EIA
- Environmental specifications for contractors should cover the required safeguards during the design and construction of the propose site.
- Approach towards voluntary compliance (ISO 14001 & ISO 18001) should be explained.

Table 15 NSBT Environmental plan/cell

<b>NSBT ENVIRONMENTAL MANAGEMENT CELL</b>				
<b>Indicator</b>	<b>Impact Associated</b>	<b>Monitoring and Evaluation(M&amp;E)</b>	<b>Budget allocation in USD(\$)</b>	<b>Time lines for implementation</b>
Waste generation	<ul style="list-style-type: none"> <li>• Aesthetic pollution</li> <li>• Breeding of vectors</li> <li>• Dawn stream pollution</li> </ul>	NSBT Environmental Safety and Health Units	10.000.00/Yr	2017-2018
Ergonomic influences	<ul style="list-style-type: none"> <li>• Internal injury</li> <li>• Deformation and posture disorder</li> </ul>	NSBT Environmental Safety and Health Units	10.000.00/Yr	2017-2018
Machinery operational influences	<ul style="list-style-type: none"> <li>• Increase emission</li> <li>• Explosion</li> <li>• Output failure</li> </ul>	<ul style="list-style-type: none"> <li>• NSBT Environmental Safety and Health Units and</li> <li>• NSBT Engineering Unit</li> </ul>	15.000.00/Yr	2017-2018
Occupational Health influences	<ul style="list-style-type: none"> <li>• Environmental Hazard increase</li> <li>• Health risk</li> <li>• Inefficiency on work</li> </ul>	NSBT Environmental Safety and Health Units	10.000.00/Yr	2017-2018

Internal Conflict Influences	<ul style="list-style-type: none"> <li>• Bias and quarrels amongst staff</li> <li>• Classism and disrespect of workers</li> </ul>	NSBT Administrative units	5.000.00/Yr	2017-2018
Accidental and emergencies	<ul style="list-style-type: none"> <li>• Explosion</li> <li>• Fire outbreak</li> <li>• Structural failures</li> <li>• Mortality loss</li> </ul>	NSBT Environmental Safety Unit and Administrative units	\$20.000.00/Yr	2017-2018
Maintenance dredging on quay bay	<ul style="list-style-type: none"> <li>• Organic and inorganic materials dislodge on open basin bowl could be saturated and increase turbidity slightly</li> </ul>	NSBT Environmental Safety Units and Engineering Units	\$ 30.000.00/WK	2017
Miscellaneous cost allocated		10% of the total EMP budget	\$10.000.00/Yr	2017-2018
Total budget for NSBT EMP on a yearly services			\$110.000.00/Yr	2017-2018

## CHAPTER SEVEN

### 7.0 COMMUNITY DEVELOPMENT ACTION PLAN

As part of the environmental and social impact assessment (ESHIA) process, NSBT is required to develop a Community development Action Plan (CDAP) to manage the activities associated with the bulk and the break; bulk establishment that may lead to the occurrence of issues that might cause negative or adverse effect on its People. The plan consist of a management strategy that is set in achieving risk reduction in the work premises.

#### 7.1 ESSENCE OF THE CDAP

NSBT has proposed to undertake Community Development Actions based on the following:

- Management of influx of people within the project area
- Establishment of sustainable livelihood
- Increase inter-cooperation and collaboration with line institutions
- Support community health promotions activities
- Support national technical innovation drive

#### 7.2 SUMMARY OF CDAP ACTIVITIES VERSUS BUDGET

**Table 16 Summary of CDAP sets by NSBT and community leaders**

CDAP INDICATOR	ACTIVITIES	OUTCOME	BUDGET	TIME LINE	RESPONSIBLE
Strengthening Education	<ul style="list-style-type: none"> <li>• provision of educative materials to schools</li> <li>• Construction/refurbishment of tertiary institution</li> </ul>	Promote education	\$ 10,000	2017-2019	NSBT
Capacity building for youth	<ul style="list-style-type: none"> <li>• Support Technical trainings for youths</li> </ul>	Improved livelihood for youths	\$ 10,000	2017-2020	NSBT
Partnership Strengthening	<ul style="list-style-type: none"> <li>• Support to institutions</li> </ul>	Increased productivity	\$ 6,000	2017-2019	NSBT
Risk reduction within working environment	<ul style="list-style-type: none"> <li>• Training of staff on occupational safety and security</li> <li>• Management of toxoids</li> </ul>	Friendly environment	\$ 4,000	2017-2019	NSBT
Health strengthening	<ul style="list-style-type: none"> <li>• Support health campaign programs</li> <li>• Support community WaSH</li> </ul>	Health promotion	\$ 10,000	2017-2020	NSBT
Miscellaneous budget on CDAP		10% of total Budget	\$4,000.00	2017-2018	NSBT
<b>Total</b>			<b>\$44,000.00</b>		

## **APPENDIX**

### **APPENDIX 1: Terms of Reference for the Environmental and Social Impact Assessment**

#### **1. GENERAL**

The First Schedule of the Environment Protection Act stipulates that all projects that hold a potential to significantly alter the surface of the earth and adversely affect human settlements will require an environmental, social and health impact assessment. The Sierra Leone Environment Protection Agency (EPA-SL) is the regulatory body with the mandate of screening and determining the category of the project. NSBT has designate the requirement for ESIA study. The company seeks the services of a consulting firm, which specializes in environmental management with experience in three phase delineation and management.

#### **2. OBJECTIVES**

The study is supposed to follow a multi-disciplinary approach. A Multi-Disciplinary Team of experts will best carry it out. The study intends to achieve the following objectives:

- i. Ensure that the communities are well informed of the project especially in terms of benefits and liabilities;
- ii. Ensure that people affected express their unfettered views about the project;
- iii. That the project is implemented in such a manner that the communities are not in any way disadvantaged or driven to the margins of survival as a result of the project. In other words, that the health and welfare of the communities are not compromised;
- iv. That habitat and biodiversity are as much as possible preserved;
- v. That pollutants are neutralized before being discharged into the physical environment but more especially water bodies;

#### **3. SERVICES TO BE RENDERED**

In general, the study should consist of a broad survey aimed at identifying the potential and actual impacts expected from the implementation of NSBT operations, inter-cooperation of general management on environmental vulnerabilities and clean-ups like the river benthic systems for the easy sail of ships and allowing health habitats lodging within. The study is intend to ascertain that neither the physicochemical environment nor the surrounding communities are compromised by the implementation of the project. It should be amply interactive and fully participatory.

In specific terms the Consultant is required to critically and thoroughly investigate the following aspects of the project:

- i. Give a thorough description of the operation of the project. This should detail plant, equipment, vehicles and machinery that may be of used in the project. This should be accompanied by a description of the area of land to be utilized;

- ii. Give a succinct definition of baseline conditions both on the biophysical and social levels. The study should seek to establish the existing climatologic conditions, topography, hydrology, natural drainage, as well as the socio-economic conditions of the people;
- iii. Give a catalogue of the applicable statutory, policy and institutional frame for such a project
- iv. Give a delineation of the negative and positive impacts envisaged. Through a comprehensive and constructive environmental management plan, there should plans on the ways of mitigating the adverse effects of the project;
- v. Propose a comprehensive monitoring plan, which has developed in consultation with the surrounding communities and the various government organs. Naturally this should commence with the identification of various performance indicators;
- vi. Estimates of the costs of implementing the environmental and social management as well as the monitoring plans should be drawn up

#### **4. THE STRUCTURE AND COMPOSITION OF THE DRAFT FINAL ESIA REPORT**

The ESIA report shall by minimum, consist of the following chapters:

- i. Executive Summary
- ii. Introduction
- iii. Detailed description of the project area and access
- iv. Detailed description of the operation of the project
- v. The applicable policy, statutory, and institutional frameworks
- vi. Biophysical, cultural and social baseline surveys
- vii. Potential and actual environmental and social impacts envisaged
- viii. Time bound environment and social management plans
- ix. Cost estimates for the implementation of the environmental and social management plans;
- x. Monitoring plan of action
- xi. Cost estimates for the implementation of the monitoring plans;
- xii. References;
- xiii. Appendixes

#### **5. COMPOSITION OF THE CONSULTANT'S TEAM**

As a minimum, the consultant's team shall comprise the following experts:

- i. Environmental Specialist/Team Leader (Environmental Health Engineer)
- ii. Socio-economist
- iii. Public health expert
- iv. Water Resource specialist
- v. Soil Scientist

**6. DURATION OF THE STUDY**

The study shall review the existing ESHIA of NSBT cover the project foot print from the date of signing the contract.

**7. REPORTING OBLIGATIONS**

The Consultant is required to submit ten hard copies with CD-ROMs to allow universal assessment by the office of the president herein refers to EPA-SL. Such a report shall have a detailed description of the access and nature of the project area. It should contain location maps as well as a description of the project operation. These pieces of basic information are needed for the regulatory agency to determine reduction in its EIA Licenses fees and review terms of refers setting with NSBT.

**8. MODE OF PAYMENT OF CONSULTING FEES**

Once the contract sum agreed by the Consultant and the Client (Nectar Sierra Leone Bulk Terminal (NSBT)). Final payment shall effect upon fulfilment of contractual obligations in the following manner:

- i. 40% of the fees shall be paid on signing the contract agreement
- ii. 50% after submitting the inception (scoping) and approved draft final report, and
- iii. 10% upon finalizing the report

**APPENDIX 2                    PICTURES ON FOCUS GROUP DISCUSSION**  
**COMMUNITY SOCIO-ECONOMIC SURVEY TOOL -**

---

**1.0 INTERVIEWER DETAILS**

Interviewers (Names)

.....  
.....  
.....  
.....  
.....  
.....

Community.....

Date.....

**2.0 COMMUNITY HOUSEHOLD TYPES/CHARACTERISTICS**

	Question/Information sought	Response(s)		
2.1	Age of house	< 1 year	1-10 years	>10 years
2.2	Type of house (tick all that apply)	Zinc	Mud	Concrete
2.3	Number of houses in the Area	1	2	>2
2.4	Size of houses	3 bedroom	5 bedroom	>5 bedroom
2.7	Toilet facility	No toilet	VIP	Pit latrine
2.8	Proximity to NSBT Site	<10 miles	Along the road	>10 miles

**3.0 FOCUS GROUP DISCUSSION/ COMMUNITY COMPOSITION**

	Question/Information sought	Response(s)	
3.1	Household head (Full Name)		
3.2	Sex (Number)	Male	Female
3.2	Ethnicity (tribe) %		
3.3	Muslims %		
3.4	Christians %		
3.5	Male secrete society members %		
3.6	Female secrete society members %		
3.7	Number of inhabitants (approximate)		
3.7.1	Boys (0-10 years old)		
3.7.2	Girls (0-10 years old)		
3.7.3	Boys (youth)		
3.7.4	Girls (youth)		
3.7.5	Married Men		
3.7.6	Married Women		
3.7.7	Unmarried men		
3.7.8	Unmarried women		

#### 4.0 OCCUPATION OF FGD/COMMUNITY MEMBERS

	Question/Information sought	Response(s)
4.1	Number of Primary school going boys	
4.2	Number of Primary school going girls	
4.3	Number of Secondary school going boys	
4.4	Number of Secondary school going girls	
4.5	Number of teachers	
4.6	Number of health workers	
4.7	Number of local council workers	
4.8	Number of civil servants	
4.9	Number of petty traders	
4.10	Number of inhabitants engaged in nothing	
4.11	Number of inhabitants with other occupations:	
4.12	Number of inhabitants with more than one occupation <sup>1</sup>	
4.13	Number of drivers/Motorbike riders	
4.14	Number of transport owners	
4.15	Number of traditional herbalists	

#### 5.0 FGD ASSETS

	Question/Information sought	Response				
5.1	Number of cell phones					
5.2	Number of radios/music players					
5.3	Furniture (Tick all that apply)	<table border="1"> <tr> <td>Bedroom</td> <td>Dining</td> <td>Living</td> <td></td> </tr> </table>	Bedroom	Dining	Living	
Bedroom	Dining	Living				
5.4	Number of foam mattresses					
5.5	Number of Motorbikes					
5.6	Number of bicycles					
5.7	Number of cars					
5.8	Number of trucks and trailers					
5.9	Rudimentary working tools <sup>2</sup>	<table border="1"> <tr> <td>Yes</td> <td>No</td> <td></td> </tr> </table>	Yes	No		
Yes	No					
5.10	Mechanized working tools <sup>2</sup>	<table border="1"> <tr> <td>Yes</td> <td>No</td> <td></td> </tr> </table>	Yes	No		
Yes	No					

#### 6.0 MONTHLY INCOME AND EXPENDITURE

	Source of income/expenditure	Amount (SLL)
Monthly income sources		
6.1	Agriculture (Trading)	
6.1.1	Livestock sales	
6.1.2	Fishing	
6.1.3	Animal products' sales	
6.1.4	Vegetable sales	
6.1.5	Fruit sales	
6.2	Transport owner	
6.3	Petty trading	

<sup>1</sup> Only if more than one of the occupations are major livelihood activities.

<sup>2</sup> Please specify in notebook

	Source of income/expenditure	Amount (SLL)
6.4	Salaries	
6.5	Commercial driving	
6.6	Rent	
6.9	Outside support from family/friend	
6.10	Legal settlement (compensation)	
6.11	Other income sources	
	Total monthly income	
Monthly expenditure		
6.12	Food	
6.13	Education	
6.14	Health	
6.15	Transport	
6.16	Funeral	
6.17	Bride price	
6.18	Clothing	
6.19	Working Tools	
6.20	Legal fees	
	Total monthly expenditure	
How do you manage your financial burden?		
6.21	Cooperatives (Osusu)	Yes No
6.22	Community banking	Yes No
6.23	Family/neighbors loan	Yes No
6.24	Sell asset	Yes No

### 7.0 SOURCE OF ENERGY (HEATING AND LIGHTING)

Code	Source	Yes	No	% Of Sources
7.1	Fuelwood			
7.2	Charcoal			
7.3	Kerosene			
7.4	Generator (Petrol)			
7.5	Generator (Diesel)			
7.6	Solar			
7.7	Car batteries			
7.8	Others			

### 8.0 WATER RESOURCES

Code	Water source	Use type
8.1	Estuary Accessibility: <1 km 1-3 km >3 km	Laundry
		Fishing
		Bathing
		Cooking
		Drinking
8.2	Tap Accessibility: <1 km, 1-3 km, >3 km	Laundry
		Bathing
		Cooking
		Drinking
8.3	Well	Laundry

	Accessibility: <1 km, 1-3 km, >3 km	Bathing
	Depth: 0-3 m, 3-7 m, >7 m	Cooking
		Drinking

**9.0 SOCIAL SERVICES**

**9.1 Education**

Name of school	School type	Pupils (M)	Pupils (F)	Teachers (M)	Teachers (F)	Hours	Private	Govt.

**9.2 Common health problems**

Health problem	Dry season	Rainy season	Year round	Permanent
Malaria				
Typhoid fever				
Hernia				
Cholera				
Diarrhea				
Dysentery				
Flue				
Tooth ache				
Skin infection				
Accident/Injury <sup>2</sup>				
Eye infection				
River blindness				
Pregnancy problems				
Mental illness				
HIV/AIDS				
Other STDs				
Victim of witchcraft				
Others				

**9.3 Where do you seek medical services for your sick family member?**

Medical service	Yes	No	Reason			
			Distance	Cost	Perception	Facilities
Community Health center						
Private clinic						
Pharmacy						
Herbalist						
Family care						

**9.4 Social groupings**

Social grouping	Yes (name group)	No	Household member(s)	Highest rank
Church group				

Muslim Jamaat				
Women’s group(s) <sup>2</sup>				
Youth group(s) <sup>2</sup>				
Cooperatives <sup>2</sup>				
Secret societies <sup>2</sup>				

**10.0 GENDER ROLES**

Activity	Household head	Men	Women	Boys	Girls
Fetch water					
Cooking					
Financing					
Household chores					
Bring up the kids					
Fishing					

**11.0 VULNERABILITY CAPACITY AND DISASTER RISK**

Type of vulnerability	Frequent	Rare	Never	Coping strategy <sup>2</sup>	Preventive measures <sup>2</sup>
Flooding					
Housing collapse					
Climate change					
Snake bites					
Drowning					
Accident					
Land slide					
Thunder Storm					
Cholera outbreak					
Ebola outbreak					
HIV/AIDS					
Rape					
Human trafficking					
Forced marriage					
Food insecurity					
Extreme poverty					
Pollution					
Child labor					

**12.0** What are your views about the proposed construction of a container terminal by NSBT?  
 .....  
 .....  
 .....

**13.0** How would the project affect you personally?  
 .....  
 .....  
 .....

**13.1** What actions should be taken to minimize the negative impacts if any?  
 .....  
 .....

.....  
14.0 Do you think the project is beneficial if all precautions are taken?

Yes ..... No.....

14.1 Please give your comments for answer:

.....  
.....  
.....

15.0 Do you have any objection for approval being given to this project?

Yes .... No .....

15.1 Please explain your answer:

.....  
.....  
.....

**16.0 FISHING SPECIFIC INFORMATION**

1. Do you have a fishing ground in this community??.....

2. Location of the fishing ground? .....

3. How many fishermen visit the fishing ground regularly? .....

3. Where do these fishermen come from?.....

4. (a) Why are you a fisherman? .....

(b) Do you have pride in your work? .....

5. How long have you been a fisherman? .....

6. Did your father/mother fish too? .....

7. (a) How long does it take to reach the fishing ground? .....

(b) Why? .....

8. (a) How do you fish? .....

(b) What fishing vessel do you use? .....

(c) Who owns the vessel? .....

(d) Size of the fishing vessel i.e.

(i) How many fishermen does it carry (Boat passenger capacity)? .....

(ii) Does it have an engine? Yes (.....) No (.....)

(iii) If yes, what is the size of the engine? ..... Horse power

9. (a) How has the catch trend been in the last 2 years?

Increasing (.....) Decreasing (.....)

(b) What causes the trend? .....

10. Who owns the fishing grounds? .....

11. How do you organize your fishing activities (e.g. do you fish alone or in groups or employed)?

.....

b) What are your future economic diversification options? .....

.....

12. What do you need in order to improve your activity? .....

### Socio-Economic Questionnaire for Stakeholder Consultation

#### STAKEHOLDER CONSULTATION

#### THE PROPOSED NSBT EXTENSION CONTAINER TERMINAL PROJECT

#### SOCIO-ECONOMIC ASSESSMENTS

#### QUESTIONNAIRE FOR STAKEHOLDERS

1. Name of officer: .....

2. (a) Organization: .....

(b) Position held: .....

3. What are your views on NSBT proposal to have inclusion of extra plots about the proposed extension of the container terminal by

NSBT?.....

.....

.....

4. (a) How would the project impact affect you personally?/ Rank by your perception the impact factor of the project to you as individual and the country: Positively-  
Negatively-

.....

.....

.....

(b) What actions should be taken to minimize the negative impacts if any? If impact is positive to you, tick the option(s) of impact areas:

- I. Socioeconomic II. Human livelihood and capacity building III. Opportunities for technological transfer

(c) If impact is positive to you tick the option(s) of impact areas:

- I. Socioeconomic II. Human livelihood and capacity building III. Opportunities for

technological transfer

5. Do you think the project is beneficial if all precautions are taken?  
 Yes..... No.....

If not, please give your comments:

.....  
 .....  
 .....

6. (a) Do you have any objection for approval being given to this project? Yes ....  
 No .....

(b) Please explain why:

.....  
 .....  
 .....

Date:.....Signature: .....

**APPENDIX 3 PLATES OF NSBT OPERATIONAL EVIDENCES**

Images showing infrastructure inherited by NSBT before	Images showing refurbished structures by NSBT intervention at the Queen Elizabeth Quay	Significant on such refurbishment by NSBT
 Customs Validation centre	 Now NSBT Training facility	<ul style="list-style-type: none"> <li>- Creation of Comfort working environment</li> <li>- Putting Sierra Leone port facilities on world standards</li> </ul>
 Stores and Workshop	 Now NSBT workshop	<ul style="list-style-type: none"> <li>- Creation of Comfort working environment</li> <li>- Putting Sierra Leone port facilities on world standards</li> </ul>



Inside Customs validation center



Now NSBT Environmental Safety Unit area

- Enhancing training facilities for entire port staff
- Creation of comfort for NSBT meetings