PROJECT SUMMARY

MODERN SPECIALIZED HOSPITAL facility:

NIGHTINGALE SUPER SPECIALITY HOSPITAL

Project: A Modernized and highly specialized Hospital

Developer: Nightingale Super Specialty Hospital Inc.

Registered Address: 137 Sheriff Street, Georgetown

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1.0 Introduction

Nightingale Super Specialty Hospital Inc. (NSSH) is registered under the company's act of Guyana with its registered office located at 137 Sheriff Street, Georgetown. This company was incorporated in March 2021 with a vision to bring to Guyana a high quality of medical services. This is a critical area of need in Guyana and will serve both the people of Guyana and the Government of Guyana as they continue to execute their function and steer Guyana into the new levels of development in both existing and new sectors.

NSSH will embody the symbol of international health care in Guyana. On its team is a group of highly trained and skilled professionals including doctors in both general and specialized areas practice, technicians and

2.0 PROJECT OVERVIEW AND LOCATION

NSSH is an estimated US$29Million, 100-bed Super Specialty hospital located in the Zone: E.B.D., Block III, Parcel 3870. NSSH hospital program is proposed to be the 1st in Guyana, and 3rd in the Caribbean to be accredited with the Joint Commission International (JCI) standard. JCI is a recognized global leader in health care accreditation, and pride itself as the author of rigorous international standards on quality and patient safety. With JCI as its partner, NSSH will be JCI- Accredited, thus benefiting from JCI's decades of expertise. NSSH will aim to ensure the following is maintained: • Get Reaccredited -Sustain continuous compliance through reaccreditation Figure 1: Location Map of Guyana Final Project Nightingale 29 July 2022 Strictly private and confidential 17 • Achieve Certification – Ensure NSSH follows the pathway to certification for the organization's disease specific specialties. • Seek Expert Advice – Continuous collaborate with JCI experts who can help NSSH improve quality and patient safety. There are ten (10) medical districts in Guyana. The proposed hospital is in region 4. Region 4 is known for being the epicenter of Guyana's healthcare with person's travelling, as far as, 7.6 miles (12.2 km) to get treatment. Outside of Georgetown Public Hospital, the Main Referral Hospital in Guyana, all hospitals in this region are private. Nightingale hospital will become the 8th hospital in region 4. While the health sector in

Guyana is growing it is noteworthy to state that the services that will be provided by NSSH is not matched by any other entity in Guyana.

2.1 **PROJECTED PROJECT TIMELINE**

The project is expected to be completed over a 9 – 24 month period. This timeline is based on experience as well as the recent timeline for the construction of a similar facility within the Caribbean region.

3.0 – **ENVIRONMENTAL ASSESSMENT**

The current environmental conditions are presented on the basis of preliminary engineering and environmental investigations. The existing environment is described only for those aspects of the physical, ecological, and human environment within the study area that are relevant to the project. The methodology used to gather data includes literature reviews, field surveys and general observations.

3.1 PHYSICAL ENVIRONMENT NOISE

The Project's construction footprint runs adjacent to and within existing housing schemes. However, no sensitive point(s) was noted given the proximity of these schemes to the construction corridor. Preliminary Noise level measurements undertaken along the construction corridor indicates that noise level was in accordance with the standard permissible limits for noise emission (dB) as set out in the GNBS *Guidelines for Noise Emission into the Environment.* Noise level testing was undertaken using the Project Department's Reed R8080 Sound Level Meter & Data Logger.

Further, noise level testing was also supported by observation and accounts from receptors. Our findings revealed that the acoustic environment throughout the project area is considered to be fair. During the project's construction phase, construction area noise and vibration will be dominated by heavy equipment use, particularly, the operation of Heavy Construction Vehicle (HCVs), generators, jack hammer, screen vibrator etc. Noise generated by the Project may represent a nuisance impact for receptors (people) near the active areas; however, any such construction noise will be managed according to the Project noise management measures to maintain compliance with the GNBS *Guidelines for Noise Emission into the Environment*.

3.2 AIR QUALITY

Air Quality measurements (PM 2.5/10) were undertaken along the construction corridor using the Project Department's Aeroqual Series 500 Portable Air Quality Monitor. Results indicate that PM 2.5/10 values were in accordance with the standard permissible limits for Particulate Matter (PM2.5/10) as set out in the World Health Organization (WHO) *Air Quality Guidelines*.

Air quality was also assessed through observations. There were no large-scale industries present along the construction corridor so there are likely to be no effect(s) from industrial emissions contaminating the air. Based on the Air Quality Index (AIQ) standard adopted from US EPA agency, the air quality was concluded to be relatively good.

During construction, the main source of Project emissions will be generation of dust from vehicle traffic on unpaved roads, as well as ground disturbing activities such as land clearing, leveling and excavation. The Project will also generate some fossil fuel combustion emissions from stationery and mobile equipment and vehicles. However fossil fuel emissions from the Project will be temporary and are not expected to be significant higher when compared with baseline levels of transportation-related vehicle emissions in the vicinity (along the existing roads, which are proposed to be upgraded).

3.3 WATER QUALITY

Water quality tests were conducted using the Project Department's Orion^{TM} AQ4500 Turbidimeter, and results were in accordance with the standard permissible limits for turbidity (NTU) as set out in the Guyana National Bureau of Standards (GNBS) *Interim Guidelines for Industrial Effluent Discharge into the Environment.* Still, the surface water located in the drains within the proposed project sites, is not recommended for human consumption, without treatment.

The water appears to be highly turbid, often times appearing to be murky and having a brownish color. It appears that run-off potentially containing mainly suspended particulate matter and organic nutrients enter drainage ways from the project area during periods of rainfall. Nonetheless, the drainage waters within project area are common with most other drainage systems of housing schemes located along the coastline. There are no existing site contamination or details of previous land uses which may have contaminated the soil or water resources in the project area.

Based on past and current experience with company-led infrastructure development works along the EBD, the hazardous materials (liquids), which are common to this type of works are fuel (diesel and petrol), plasticizer, hydraulic fluid, grease, tar, rust-out, engine oil and paint. However, many of these materials are not regularly stored onsite, but rather are transported and used on site based on project needs. Transport, storage, loading and offloading of hazardous materials must be done in accordance with the EPA's Environmental Guidelines for the Transportation, Storage and Occupational Handling of Chemical/Industrial Hazardous Waste, EPA, 2011.

However, during construction, the company recognizes that spills or leaks of hazardous

substances can occur and could compromise local surface water quality. Therefore, although any spills of hazardous materials would be small and localized given the usual offsite storage of hazardous materials or within proper containment units, any spills or leaks are promptly managed according to the Spill Prevention, Control and Countermeasures specified in Table 4.1

3.4 ECOLOGICAL ENVIRONMENT AND CULTURAL HERITAGE

There are no areas of ecological value such as protected areas, national parks and mangrove areas, which are located within the project area.

3.4.1 Fauna And Flora. The vegetation around the project area comprises secondary disturbed vegetation, primarily shrubs, herbaceous plants, trees and several species of grasses including rice. Like the flora, fauna is very common and can be found throughout the coastal plain especially on abandoned agricultural lands and near coastal housing areas. The surrounding areas are mainly populated and there is little space for wild animals to breed and reside.

3.4.2 Aquatic Environment. The project area is bounded by canals on all sides and comprises of drains on both sides of access roads adjacent to the project location. Aquatic life including fishes and common aquatic weeds are present in these canals. Given that the Project will need to maintain the integrity of surrounding drainage network given their importance of stormwater collection (and therefore safeguard against flooding), the Soil and Drainage Management measures specified in Table 4.2 will be initiated.

3.4.3 Threatened/ Endangered Species. No threatened and endangered species are present in the proposed project area. The area largely comprises secondary vegetation succession resulting from land clearing activities (at the landscape scale) as part of the company's phase 1 development works for the construction of a residential/commercial/industrial zone. The proposed area is currently vacant but is mainly surrounded by populated Housing Schemes, and there is little space for wild animals to breed and reside.

3.4.4 Cultural Heritage. There are no sites of historical, archaeological or cultural value, which are located within the project area.

3.5 HUMAN ENVIRONMENT LAND USE

The project site was previously used for sugar cane cultivation but was subsequently acquired by the Government of Guyana from GUYSUCO for the purpose of housing development and later sold to the company for future residential/industrial/commercial development. To this day, the area has been cleared but has remained largely undeveloped. Therefore, a Project-wide Stakeholder Engagement Plan (SEP) will be developed and activated to foster close dialogue with all stakeholders including utility providers, residents, business owners etc., and maintain communication and awareness regarding critical project-related issues. With regards to the former, the Project-wide Grievance Management Plan (GMP) will also be initiated to address grievances arising from stakeholder engagements.

3.5.1 Social Infrastructure. The housing schemes surrounding the project location along the EBD comprises of several social/community infrastructure and supporting services including Primary School, Secondary School, Police Station, Recreational grounds, Health Centers, and Religious Institutions etc. Around the construction zone, there is the presence of public utility infrastructure such as GPL Transmission Lines & Poles, Digicel/GTT Communication Lines, and possibly Fiber Optic cables. Buried GWI Water Distribution Lines may also be present along those secondary roads, which border the project area. It is unlikely that utility services bordering the project location may be disrupted given that such infrastructure is well out of the construction corridor. However, it is expected that such disruptions will be mitigated via the utility measures specified in Table 4.2.

3.5.2 Waste Collection and Disposal. Surrounding communities are largely serviced by organised solid waste collection and disposal systems. In this context, residents may contract the services of private waste disposal firms or by way of the local NDC for the collection of their refuse by way of garbage trucks, which is later transport to the Haags Bosch Sanitary Landfill for final disposal. Waste is also commonly disposed of where it is generated, typically by burning or burial.

3.5.3 Sewerage And Wastewater Disposal. There are no sewerage collection and treatment facilities in the area. The main means of sewerage disposal for residents is via septic tank system, and to a smaller extent, pit latrines. Wastewater disposal is via open drains to drainage canals.

4 - IDENTIFICATIONS OF POTENTIAL IMPACTS/RISKS

In order to safeguard against the numerous environmental and social impacts/risks, which are ever-present at construction sites, the company recognizes that all construction activities must be carried out in a competent manner in strict compliance with all applicable Health, Safety and Environmental legislation in Guyana.

The following HSE impacts/risks were identified and are summarized in Table 3.1. Environmental performance objectives for each HSE element relevant to the construction works are also set out in Table 3.1.

Table 4.0 Potential Impacts/Risks and Performance Objectives

Topic	Potential impacts	Performance Objectives
Occupational Safety and Health	Injury to life, limb or health of life of onsite workers.	*To prevent accidents and injuries during construction as part of an Incident and Injury Free (IIF) operation.*
Traffic	Increase in traffic congestion (delays) largely due to increase movement of Heavy Construction Vehicle (HCV) in and out of the project area, and temporary closures (road/street, lane, footpath, and shoulder) and detours to facilitate construction/construction related	*To minimize traffic interactions and appropriately manage traffic interfaces.*
	Increase in the risk of accidents to workers and public road users from increase HCV traffic.	
	Damage to access roads and residential streets used as HCV routes.	
Access	Restricted access to properties (homes and business)	*To minimize disruptions to access and provide alternative access in the event of disruptions.*
	Restricted access to recreational facilities, health centers, learning centers, church/mosque, and other public/community spaces and facilities	
Waste	Increased waste generation from project related construction waste, and domestic waste and sanitary waste from workers.	*To minimize the wastes generated and resources used throughout the life of the proposed works, and maximize opportunities for waste avoidance, reduction, reuse and recycling*
Hazardous Materials	Environmental contamination from spill/leak of hazardous material stored/transported/loaded/unloaded onsite, and contaminated media (from latrines, septic tanks etc.) disturbed during excavation activities.	*To prevent the release of hazardous substances to the environment.* *To store, handle, transport, and employ resources/dispose of waste in a manner that does not lead to environmental harm, pollution or contamination.*

Topic	Potential impacts	Performance Objectives
Livelihood	Potential for economic displacement of roadside vendors, and disruption of residential access bridges.	*To minimize disruptions to access and avoid economic displacement as far as practical.* *To provide project affected persons with entitlements to restore livelihoods.*
Utilities	Interruption to water, electricity, landline and broadband services during relocation/stoppage to facilitate construction works in the area or as a result of accidental damage from construction works	*To minimize disruption to utility services.*
Drainage	Compromised drainage canal integrity (increased blockage from increased effluent loads, erosion, sedimentation and solid waste)	*To prevent the blockage of canals through proper management of waste, and excavation activities*
Soil	Increased erosion, especially during periods of heavy rainfall and from storage areas and areas exposed/disturbed including stockpile areas, roadways, active excavation areas, areas where soil has been	*To minimize the occurrence of soil/wind erosion during construction activities and or within the construction zone.*
Air Quality	Increased dust generation (reduced air quality) from excavation and land clearing activities, HCVs traversing area, loading/unloading of debris/materials and onsite stockpile areas etc	*To prevent a decrease in local air quality and to prevent visible emissions of dust from the site.*
Water Quality	Increased effluent loads, erosion, sedimentation and solid waste. Pollution of surface water from hazardous material spillage.	*To prevent the pollution of water and the generation of excessive Turbidity/effluent discharge.* *To minimize the environmental impact of any spills and excessive turbidity that*
Noise	Increased noise and vibration from the operation of HCVs and heavy construction equipment including generators, cement mixers, jack hammers etc	*To minimize disturbance to sensitive receivers from vibration, and airborne noise*

4.1 SIGNIFICANCE OF IMPACTS

Planned activities to be performed during construction and operation phases of the project need to be managed to reduce the possibility of adverse impacts occurring and to enhance the likelihood of the work being performed safely with minimal risk/impact to the environment. No planned activity scored a rating higher than Medium, either Adverse or Beneficial. This assessment does not consider impacts potentially arising from unplanned project activities, such as accidental releases or upsets.

Table 4.1 Summary of Social Impact Assessment

Impact Producing Activity	**Operational Controls and Regulatory Compliance**	**Anticipated Impact**	**Impact Assessment**					**Management Measures Required**
			Type	**Significance**	**Probability**	**Impact Risk**	**Cumulative Impact**	
Health and Safety								
Air Emissions	Compliance with Guyana regulations. Best practices for equipment maintenance	Emissions to air from operation of equipment. Anticipated pollutants include Dust, SOx, NOx, VOCs, and CO.	Adverse, Direct, Localized	Negligible	Certain	Low Adverse	Low Adverse	Yes
Movement of Heavy-Duty Machinery and Vehicles	Compliance with Guyana regulations Best practices	Occupational Injuries/Fatalities	Adverse, Direct, Localized	Moderate	Unlikely	Medium Adverse	Medium Adverse	Yes
Noise & Vibration	Compliance with Guyana	Noise and vibration pollution	Adverse, Direct, Localized	Negligible	Certain	Low Adverse	Low Adverse	Yes

	regulations							
Light	Best practices	Light pollution	Adverse, Direct, Localized	Negligible	Certain	Low Adverse	Low Adverse	No
Occupational Hazards	Compliance with Guyana regulations Best practices	Occupational Injuries/Fatalities	Adverse, Direct, Localized	Moderate	Unlikely	Medium Adverse	-	Yes
Congregation of workers in the Project Area	Compliance with Guyana regulations Best practices	Increase transmission of COVID-19 within the Area.	Adverse, Direct, Localized	Minor	Unlikely	Medium Adverse	Medium Adverse	Yes
Employment and Infrastructure								
Employment	Compliance with Guyana regulations	Generation of 90 full time jobs during operation of the Facility, and 100 jobs during the construction phase.	Beneficial, Direct, Localized	Moderate	Certain	Medium Beneficial	-	No
Road Traffic								
Road Traffic	Compliance with Guyana regulations	Increase in road traffic in the vicinity of the Facility	Adverse, Direct, Localized	Moderate	Certain	Medium Adverse	Medium Adverse	Yes
Cultural Heritage								
Cultural Heritage	Best practices	Disruption of living Heritage sites (Places of Worship)	Adverse, Indirect, Local	Negligible	Rare	Low Adverse	-	No
Abiotic & Ecological Environment								

Air Emissions	Compliance with Guyana regulations. Best practices for equipment maintenance	Emissions to air from operation of equipment. Anticipated pollutants include Dust, SOx, NOx, VOCs, and CO.	See Health and Safety Section above					
Drainage Integrity	Compliance with Guyana regulations. Best practices	Increased effluent loads, increased. blockage of canals	Adverse, Direct, Localized	Negligible	Certain	Low Adverse	Low Adverse	Yes
Soil Quality	Compliance with Guyana regulations. Best practices	Erosion	Adverse, Direct, Localized	Negligible	Certain	Low Adverse	Low Adverse	Yes
Water Quality	Compliance with Guyana regulations. Best practices	Storm-water runoff; increased effluent loads from erosion and increase in construction waste.	Adverse, Direct, Localized	Negligible	Certain	Low Adverse	Low Adverse	Yes
Aquatic Life, Birds and Flora	Compliance with Guyana regulations. Best practices	Disruption to feeding and breeding patterns, and disruption of natural habitats.	Adverse, Direct, Localized	Negligible	Unlikely	Low Adverse	Low Adverse	No
Waste	Compliance with Guyana regulations. Best practices	Waste Generation	Adverse, Direct, Localized	Moderate	Certain	Medium Adverse	Medium Adverse	Yes
Hazardous Materials	Compliance with Guyana	Environmental Contamination	Adverse, Direct,	Moderate	Unlikely	Medium	Medium	Yes

	regulations. Best practices		Localized			Adverse	Adverse	
Light, Noise and Vibration Emission	Compliance with Guyana regulations. Best practices	Noise and vibration pollution	See Health and Safety Section above					

5. MANAGEMENT MEASURES

In keeping with the performance objectives specified in Table 3.1, the management measures presented in Table 4.1 will be employed to eliminate/mitigate/manage environmental impacts/risks and safeguard the health and safety of onsite personnel including the residents of the project-affected community. These measures largely make up the Projects' Environmental and Social Management Requirements (ESMR), which must be implemented by all Contractors under the Project as part of their Contract with the company.

Further, the mmanagement measures presented in Table 4.1 will be employed will be carried out in strict compliance with the following legislation and guidelines:

Applicable Legislation

- Occupation Health and Safety Act, Cap 99:10
- Environmental Protection Act, Cap 20:05
- Environmental Protection (Hazardous Wastes Management) Regulations 2000
- Environmental Protection (Water Quality) Regulations 2000
- Environnemental Protection (Noise Management) Régulations 2000
- Environmental Protection (Air Quality) Regulations 2000
- Environnemental Protection (Litter Enforcement) Régulations 2012
- Town and Country Planning Act, Cap 20:01
- Municipal and District Councils Act, Cap 21:01
- Motor Vehicle and Road Traffic Act, Cap 51:02
- Roads Act, Cap 51:01
- Water and Sewerage Act, Cap 30:01

Applicable Guidelines

- EPA Environmental Guidelines for transportation, storage and occupational handling of chemical/industrial hazardous wastes.
- WHO Air Quality Guidelines for particulate matter
- GNBS Guidelines for Noise Emission into the Environment
- GNBS Interim Guidelines for Industrial Effluent Discharge into the Environment.
- Multi-Hazard Disaster Preparedness and Response Plan, Civil Defence Commission, 2013
- Fire Service and Rescue Service: Strategic Plan 2014-2018, Guyana Fire and Rescue Service, 2014

Table 5.0 Management Measures

Topic	Key Management Measures
Emergencies	The company recognizes that as part of, and in addition to, risk prevention measures, there should be adequate preparedness and response activities in case an emergency occur. **Therefore, the company will develop a detailed Emergency Preparedness and Response Plan (EPRP) that describes forecasted or unanticipated events, and will include provisions for the following:** Emergency Equipment Emergency Contacts Emergency Reporting Response Procedures for Fire/Medical emergencies, Natural Disaster/Storm/Adverse Weather, Vehicle Collision, General Evacuation, Spills, and General Emergency Response.
Occupational Safety and Health Management	A stocked first-aid kit will be available and easily accessible on site, and adequate to cater for the number of onsite personnel. Workers will be provided with basic PPEs (e.g., hardhats, high-visibility vests, safety footwear), and activity specific PPEs where necessary e.g., welding goggles/safety goggles when welding. Workers will be provided with respiratory protection during activities which generate dust, fumes or mist (e.g., dust masks, respirators etc.) Workers will be provided with ear/noise protection during periods of excessive noise (e.g., earmuffs/ear defenders). Firefighting equipment will be available and accessible onsite (e.g., fire extinguisher, filled water tanks, fire buckets etc.). An Accident/Incident Register will be maintained onsite in keeping with section 69 (7) of the OSH Act, cap 99:10. Workers will be provided with sanitary facilities including a portable toilet and hand-washing stations.
Traffic Management	**A Traffic Management Plan (TMP) will be developed, and will include but not limited to the following requirements:** Relevant reflectorized traffic signs and devices (as needed based on the day's activity) will be clean, free of defect, mounted & positioned correctly, and visible for the safety and convenience of the traveling public and the workers. Safety barriers, cones, delineators and containment fences will be in place where necessary. Speed limits, speed humps will be applied correctly for the day's works. HCVs will only be parked in designated areas.

Topic	Key Management Measures
	HCVs will be compliant with safety measures. E.g., flashing lights, audible reverse alarms, seat belts, air bags, speed limits, certification of fitness etc. Clearance between works and adjacent traffic will be maintained at all times (flagmen will be present to guide traffic flow around/through work area). HCV movements on local roads will be limited to the off-peak traffic flow periods. Driving surfaces will be adequate for road users (motorists and pedestrians alike) after the day's construction activities. Adequate security measures will be put in place for night works, including measures for workers and road users alike? Appropriate signs and night devices (including worksite lighting and reflectorized signs/devices) will be provided, positioned and mounted correctly during night-time/after hour works. The Public will be notified in advance on any interruptions/temporary changes which may occur as a result of the day's works and or traffic management activities.
Access Management	**An Access Management Plan (AMP) will be developed, and will include but not limited to the following requirements:** Proper access to site and side roads will be provided and will cater for the passing road users (pedestrians, motorists, disabled community members). Temporary/alternative routes to and crossings into properties (homes and businesses alike) and community facilities will be provided where such access has been disrupted. Bus stops/pedestrian crossings will be temporarily relocated to a safer location where access has been disconnected due to safety concerns or construction works.
Waste Management	**A Waste Management Plan (WMP) and Hazardous Materials Management Plan (HMMP) will be developed, and will include but not limited to the following requirements:** Waste collection receptacles will be provided onsite, and will be labelled, upright and properly covered at all times. Portable toilets will be provided for workers and visitors. Waste storage areas will be properly prepared, labelled (signs) and secured.

Topic	Key Management Measures
Hazardous Materials Management	Hazardous waste will not be mixed with trash. The site will be maintained clean and tidy (free of litter and organized): - A 'good housekeeping program' will be enforced after each day of work. Nearby drains/waterways will not be impeded with construction materials/waste, and will be regularly monitored for debris, and cleaned when necessary. Chemicals/hazardous materials (stored onsite) such as fuel, paint, oil, etc. will be labelled, and properly and securely stored in a designated hazardous material storage area, and within compatible, tightly secured and corrosion free containers in order to prevent leaks/spills. Wastes, especially construction wastes, sanitary waste and general refuse will be regularly collected and disposed offsite at an approved Sanitary Landfill, and further ensure no items fall into the surrounding water. No burning of waste will be allowed under any circumstances. Waste generation will be minimized by implementing the following waste hierarchy: -Avoid waste by identifying appropriate materials and effective procurement. -Reduction of waste by optimizing construction and operation methods. -Reuse waste by identifying sources that can utilise the waste. -Recycle waste by identifying facilities that are able to recycle waste.
Utility services	Public utility infrastructure (GWI water distribution lines, GTT-GPL transmission poles and GTT fiber-optic cables) which stand to be affected by Construction works will be suspended or relocated in consultation, coordination and supervision of the respective utility provider. The Public will be notified in advance on any interruptions/temporary disruptions which may occur as a result of the relocation/suspension.
Drainage/Water Quality	**A Soil and Drainage Management Guideline (SDMG) will be developed, and will include but not limited to the following requirements:**
Soil	Erosion, siltation and sedimentation will be avoided by limiting the size of the disturbed area and duration of soil exposure. Temporary stockpiles of materials will be located away from waterways (when possible). Construction activities will not be conducted in heavy rainfall conditions (scheduling of construction works will be undertaken).

Topic	Key Management Measures
	Areas of exposed soil will be monitored (and protected where necessary) during periods of heavy rainfall. The natural vegetative cover (especially along roads, adjacent drainage and in the vicinity of slopes) will be maintained as far as practical. Drains/canals will be free of construction waste/materials (regular inspection and clearing of waterways will be conducted). Active construction areas, especially excavated areas under construction will be covered during periods of heavy rainfall. Water Quality Testing will be conducted to ensure turbidity (NTU) is within the permissible standard limits set out in the *GNBS Interim Guidelines for Industrial Effluent Discharge into the Environment*
Air Quality	Water suppression will be employed to control dust levels. Dusty areas such as material stockpiles will be covered with tarp/matting when not being used. Dust screens will also be erected around areas with high risk of dust during windy conditions. Material loads that have the potential to generate dust will be covered during transport. Dust generating activities will not be carried out during periods of high wind. Air Quality Testing will BEconducted to ensure PM2.5/PM10 is within the permissible standard limits set out in the *WHO Air Quality Guidelines* for particulate matter.
Spills	**A Spill Prevention, Control and Countermeasures Plan (SPCCP) will be developed, and will include provisions for the following:** Spill Response, Emergency Spill Response Equipment, and Emergency Contact Reporting Spills Spill Prevention Measures (during Storage, Loading & Unloading, Transportation) Disposal of contaminated material
Noise	The hours of construction work will be limited to between 6:00 am and 7:00 pm (Guyana Standards), and construction at night (e.g., 10 pm to 6 am) will be avoided, as far as practical. Construction vehicle idling will be limited. Sound-making devices will be equipped with silencers/mufflers to reduce noise level and or enclosed in an insulated environment (acoustic screening). Equipment will be maintained in good working order to minimize noise.

Topic	Key Management Measures
	All feasible and reasonable noise mitigation measures will be implemented during construction works, with the aim of achieving the construction noise management levels set out in the GNBS Guidelines for Noise Emissions into the environment. Respite periods will be implemented when undertaking high noise generating works. Noise level testing will be conducted to ensure noise levels are within the standard limits (day and nighttime limits) for the execution of construction activities as set out in the *GNBS Guidelines for Noise Emission into the Environment.*
Compliance Monitoring	**An Environmental, Health and Safety (EHS) Monitoring Plan will be developed to ensure regular monitoring is undertaken by the Company. The EHS Monitoring Plan will include provisions for the following:** Protocols for monitoring Air Quality, Surface Water Quality, Noise & Vibration, Traffic Management, Waste Management, Hazardous Materials Management, Spill Prevention, Control & Countermeasures, Access Management, Emergency Preparedness and Response, Soil and Drainage Management, and Occupational Health & Safety.

To ensure successful implementation of the above measures, training and site safety meetings will be initiated and monitored by the company. The Environmental and Social Management Plans (ESMPs) listed above will therefore include specific requirements for undertaking regular training and site safety meetings to ensure their successful implementation on a daily basis.

6.0 WASTE PRODUCTION AND MANAGEMENT

The following is an overview of waste production, including types of waste, monthly quantities/volumes, effluent composition, waste disposal/treatment methods, and potential recovery/disposal sites for a hospital:

1. Types of Waste:
General Waste: Non-hazardous waste from administrative areas and public spaces.
Medical Waste: Infectious waste from patient care areas, including sharps, contaminated materials, and biological waste.
Hazardous Waste: Chemicals, pharmaceuticals, and other materials classified as hazardous.
Electronic Waste (E-Waste): Discarded electronics and IT equipment.
Construction and Demolition Waste: Debris from construction and renovation projects.
Organic Waste: Food waste from cafeteria and kitchen areas.

2. Effluent Composition and Chemical Analysis:
Effluent Type: Wastewater from various hospital activities.
Chemical Analysis: Chemical composition including pH, BOD (Biochemical Oxygen Demand), COD (Chemical Oxygen Demand), TSS (Total Suspended Solids), heavy metals, and any specific pollutants based on local regulations.

3. Methods of Waste Disposal/Treatment:
General Waste: Collected and sent to a local landfill.
Medical Waste: Treated via autoclaving or incineration at an authorized facility.
Hazardous Waste: Segregated and sent to licensed hazardous waste treatment facilities.
E-Waste: Sent to certified e-waste recycling centers.
Construction and Demolition Waste: Sorted and sent for recycling or responsible disposal.
Organic Waste: Composted or sent to anaerobic digestion facilities.

4. Potential Locations for Recovery/Disposal Sites:
General Waste: Local landfill or waste management facility.
Medical Waste: Licensed medical waste treatment facility.
Hazardous Waste: Licensed hazardous waste treatment facilities.
E-Waste: Certified e-waste recycling centers.
Construction and Demolition Waste: Certified construction waste recycling centers.
Organic Waste: On-site composting facility or off-site anaerobic digestion.

7.0 DECOMMISSIONING

If environmental damage is determined to be the fault of the company, then the company will make every effort to investigate and clean-up. The nature of this project's activities, as a temporary use of land, should not impose any permanent constraints on any future beneficial use of the area, nor have any permanent effects on the local water resources, biodiversity, overall landscape quality and associated socio-economic development.

The principal objectives of closure and decommissioning would be to:

- Identify suitable best practice measures that are appropriate and can meet the requirements of the regulatory agencies, while satisfying international benchmarks and standards for the sector.
- Contribute to the effective management of environmental and social issues as a means of facilitating effective closure.
- Return the land as close as possible to pre-project conditions.
- Minimize the potential for any negative post-closure impacts and liabilities.
- Minimize the requirements for active management of the post-closure environment.
- Maximize the potential for post-closure environmental and social benefits.

In addressing the principal closure and decommissioning issues, the Closure Plan is envisaged to include the following actions:

- Removal of all machinery/equipment from the site.
- All non-permanent project components and facilities will be demolished and removed.
- All waste will be removed from the site.
- Any contaminated area will be cleaned up.
- The relevant Government Authorities and the employees/workers will be informed at least three months in advance. NIS and PAYE contributions for staff will be discontinued.
- Severance pays for employees/workers will be paid, along with all other monetary resources due to them, as required by Guyana's Labour Act and the Termination and Severance Payment Act.

All other obligations of the Company, required by the Laws of Guyana, will be settled.

8.0 DISCHARGING ACTIVITIES

8.1 DISCHARGES & EMISSIONS

The processes generating discharges and emissions for this project will fluctuate depending on the occupancy of the hospital. Below is a s summary of the expected processes that will generate discharges and emissions:

Energy Generation and Usage

Operating continuously, the hospital requires a substantial amount of energy for lighting, medical equipment, and maintaining optimal conditions. Incorporating a fusion of renewable energy sources such as solar panels and wind turbines, along with energy-efficient technologies, allows for a significant reduction in reliance on fossil fuels. By employing energy-conserving LED lighting, optimizing HVAC systems with advanced controls, and implementing intelligent building management systems that adapt to varying usage patterns, the institution effectively curbs energy consumption and subsequent emissions.

Boiler Operations

The hospital, conscious of its environmental footprint, contemplates adopting pioneering combustion technologies like fluidized bed combustion for its boilers, ensuring a more environmentally friendly burn. Integrating low-NOx burners, exhaust gas recirculation systems, and selective catalytic reduction units yields a marked decrease in nitrogen oxide emissions. Moreover, incorporating scrubbers and advanced flue gas desulfurization units facilitates the efficient capture of sulfur dioxide emissions before their release into the atmosphere.

Backup Generators

The pursuit of sustainable alternatives for backup power remains paramount. The institution explores options such as natural gas generators and state-of-the-art fuel cell systems to ensure a reliable power source with minimal emissions. Through the application of load management strategies and the seamless integration of energy storage solutions, the institution achieves a decreased dependence on backup generators, leading to a reduction in associated emissions.

Medical Waste Incineration

It is important to take a responsible stance toward medical waste management, considering advanced incineration technologies like controlled air incinerators or fluidized bed incinerators. These systems, designed to maintain optimal temperatures and oxygen levels, ensure the thorough incineration of medical waste while minimizing the formation of hazardous byproducts. Incorporating real-time monitoring and automated controls further heightens efficiency and minimizes emissions.

Sterilization and Disinfection

Demonstrating its dedication to sustainability, the institution explores emerging sterilization methods such as hydrogen peroxide vapor or ozone-based processes. These alternatives yield fewer emissions compared to conventional ethylene oxide methods. Ensuring the meticulous design of ventilation systems capable of capturing and treating emissions arising from these processes underscores its commitment to a secure work environment and the prevention of harmful substances' release into the air.

Laboratory Operations

Embracing green chemistry principles, aligning seamlessly with its sustainability objectives. A strategic reduction in the use of hazardous chemicals within its laboratories is pursued, resulting in a consequential decrease in emissions. The introduction of advanced local exhaust ventilation systems, complemented by HEPA filters, expertly captures and eradicates airborne contaminants, enriching overall indoor air quality.

Vehicle Emissions

With a fervent commitment to comprehensive vehicle emission reduction, the institution motivates staff to embrace eco-friendly transportation choices. Through the establishment of electric vehicle charging infrastructure and the gradual transition to electric or hybrid vehicle models, the institution not only reduces emissions but sets a precedent of environmental consciousness for the community.

Wastewater Discharges

The hospital will demonstrate a responsible approach to wastewater management through the application of advanced treatment solutions. Technologies like membrane bioreactors and advanced activated sludge processes guarantee the meticulous removal of contaminants from its wastewater. Employing on-site treatment systems, the institution ensures wastewater is thoroughly treated prior to discharge, safeguarding the integrity of local water bodies.

Cooling Systems

There will be the integration of environmentally friendly practices in its cooling systems by advocating for the utilization of natural refrigerants such as ammonia or carbon dioxide. Diligent maintenance and a rigorous leak detection regime are employed to forestall refrigerant emissions, fostering both operational efficiency and environmental preservation.

Construction and Renovation

During construction and renovation endeavors, the institution maintains a steadfast focus on emissions reduction. Incorporating advanced dust control measures, employing water sprays, embracing encapsulation techniques, and enforcing proper disposal protocols collectively contribute to a diminished environmental impact throughout these phases.

8.2 DISCHARGES & EMISSIONS - DETAILS

For a small hospital, the expected pollutants, discharge rates, concentrations, and volumes may be lower compared to larger healthcare facilities. Here's an overview:

1. Energy Generation and Usage:

Description: A small hospital relies on energy for lighting, medical equipment, and basic heating and cooling.
Pollutants: Primarily carbon dioxide (CO2) from electricity consumption.
Discharge Rates: Moderate, reflecting the hospital's size and energy needs.
Concentrations: CO2 concentrations are typically measured in parts per million (ppm).
Volume: Moderate, in line with the facility's energy demands.

2. Medical Waste Incineration:

Description: A small hospital generates a relatively small amount of medical waste that requires incineration.
Pollutants: Dioxins, furans, heavy metals (mercury, lead), hydrogen chloride (HCl), particulate matter.
Discharge Rates: Low due to limited medical waste generation.
Concentrations: Concentrations depend on waste load and incineration efficiency.
Volume: Low, reflecting the smaller waste quantities.

3. Sterilization and Disinfection:

Description: Sterilization processes are conducted on a smaller scale for medical equipment and supplies.
Pollutants: Ethylene oxide (ETO), volatile organic compounds (VOCs).
Discharge Rates: Low, reflecting fewer sterilization procedures.
Concentrations: ETO levels are monitored in parts per billion (ppb).
Volume: Low due to smaller sterilization activities.

4. Laboratory Operations:

Description: Laboratory activities are limited in scope, resulting in fewer chemical emissions.
Pollutants: Hazardous chemicals, VOCs.
Discharge Rates: Low due to reduced chemical usage.
Concentrations: Concentrations depend on specific chemicals and processes.
Volume: Low, reflecting the smaller laboratory scale.

5. Vehicle Emissions:

Description: The hospital has a small fleet of vehicles, and employee commuting distances

may be shorter.
Pollutants: Carbon monoxide (CO), nitrogen oxides (NOx), particulate matter.
Discharge Rates: Low due to fewer vehicles and shorter commutes.
Concentrations: CO and NOx concentrations are measured in parts per million (ppm).
Volume: Moderate, considering the smaller number of vehicles.

6. Cooling Systems:
Description: Cooling systems are smaller and used for limited spaces.
Pollutants: Refrigerants (hydrofluorocarbons - HFCs).
Discharge Rates: Low due to smaller cooling systems.
Concentrations: Concentrations are typically very low.
Volume: Low, reflecting the scale of cooling equipment.

7. Construction and Renovation:
Description: Construction and renovation activities are infrequent and on a smaller scale.
Pollutants: Particulate matter, volatile organic compounds (VOCs), nitrogen oxides (NOx).
Discharge Rates: Low due to occasional construction work.
Concentrations: Concentrations depend on specific construction activities.
Volume: Low, reflecting the smaller construction scope.

9.0 NON-TECHINICAL EXPLANATION

Our hospital aims to be a specialized medical facility that offers a comprehensive range of healthcare services, treatments, and patient care. Serving as a vital cornerstone of medical care, hospitals play a pivotal role in diagnosing, treating, and preventing various illnesses and injuries. Additionally, it will contribute to medical research advancements and provide training for healthcare professionals. The intricate landscape of a hospital's operation, management, and financing demands meticulous planning, cohesive organization, and seamless coordination across all its facets.

In the realm of our hospital operations, an intricate network of departments and services comes into play. Clinical services, spanning medical, surgical, emergency, intensive care, radiology, laboratory, and pharmacy, operate in tandem with non-clinical services like administration, finance, human resources, information technology, facilities management, housekeeping, and security. The spectrum of patient care encompasses stages from admission, diagnosis, treatment, and monitoring to eventual discharge, coupled with comprehensive patient education. Equally integral are support services such as dietary provision, laundry, medical recordkeeping, billing, and maintenance. A paramount aspect of hospital operations lies in maintaining robust quality control measures that ensure adherence to medical standards, safety protocols, and patient contentment.

Meanwhile, hospital management orchestrates the intricate symphony of the facility's functioning. This involves oversight across all operational facets to ensure efficiency, quality of care, and regulatory compliance. The tapestry of roles within hospital management encompasses a variety of key positions. Hospital administrators guide strategic planning, policy implementation, and financial management. Clinical managers provide oversight for medical departments, ensuring optimal staffing, resource allocation, and adherence to rigorous medical protocols. Operations managers navigate the realms of non-clinical services, overseeing facilities, housekeeping, and various support functions. Quality assurance managers meticulously safeguard patient safety, medical quality, and regulatory alignment. The human resources facet is guided by managers who meticulously handle staffing, training, and personnel management. Simultaneously, financial managers carefully steward the hospital's fiscal health by managing budgets, billing, insurance, and financial reporting.

A cornerstone of our hospital operations is the intricate web of finances that fuels its functionality. Revenue streams stem from diverse sources, including patient fees for medical services, consultations, tests, procedures, and surgeries. The hospital's financial sustenance is bolstered through insurance reimbursements from private insurance companies and governmental health programs. Grants and donations contribute to funding, coming from research grants, philanthropic contributions, and government subsidies. Investment income, arising from prudent investment strategies and endowments, further strengthens the financial landscape.

The journey of establishing this hospital traverses multifaceted phases. Planning initiates the process by assessing community healthcare needs, designing the hospital's layout, and obtaining essential approvals. Subsequently, the design phase unfolds, where architectural and engineering blueprints are crafted, meticulously considering medical functionality, safety parameters, and aesthetic elements. Construction marks the tangible realization of the hospital's vision, entailing the creation of foundations, structures, utilities, and interiors. As construction concludes, the critical phase of equipment setup ensues, involving the installation of essential medical equipment, furniture, IT systems, and requisite resources. Regulatory compliance is paramount, ensuring alignment with healthcare regulations and stringent safety standards. The preparation of medical and non-medical staff through comprehensive training programs is an essential final step that primes the hospital for operation.

Human resources constitute the lifeblood of hospital functioning, encompassing a diverse array of healthcare professionals and support staff. The medical realm thrives on the expertise of physicians, nurses, surgeons, anesthesiologists, radiologists, and various specialists. This professional tapestry interlaces with a dynamic support staff, spanning administrative personnel, receptionists, medical assistants, technicians, and janitors. Effective hospital management involves the guidance of administrators, department heads, managers, and quality control personnel. Auxiliary services further contribute to seamless operations, including dietary staff, housekeeping, maintenance crews, and security personnel. Within this framework, specialists such as social workers, counselors, pharmacists, and laboratory technicians complement the multifaceted team.

In essence, the creation and sustained success of a hospital necessitate a holistic approach that integrates medical excellence, efficient operations, and fiscal responsibility. It underscores the imperative of quality healthcare provision while meticulously navigating the complex interplay of operational intricacies and financial equilibrium.

10.0 ENVIRONMENTAL COMPLIANCE

NSSH commits to compliance with all regulations and guidelines prescribed by the EPA as well as, those prescribed by other governmental entities, in all efforts to ensure that good environmental and industrial practices are maintained throughout the various phases of this project during construction and operation. NSSH shall work towards full adherence with the Laws of Guyana.