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ARAWAK CAY LNG PROJECT

Environmental Impact Assessment

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Prepared for: Island Power Producers
Submission Date: October 9th, 2025
Revised Date: December 17th, 2025

Document History			
Company	**Description**	**Name**	**Date**
JSS	Arawak Cay LNG Project Environmental Impact Assessment Final	CM	October 9th, 2025
JSS	Arawak Cay LNG Project Environmental Impact Assessment Final Revised	CM	November 19th, 2025
JSS	Arawak Cay LNG Project Environmental Impact Assessment Final Revised	CM	December 15th, 2025

Executive Summary

The Government of the Commonwealth of The Bahamas (GOTB), through its Ministry of Energy and Transport, as well as Bahamas Power and Light Company Ltd. (BPL), has awarded the proposed shore power liquefied natural gas (LNG) fueled power plant (The Project) to be located on Arawak Cay, New Providence, The Bahamas. This generator facility will supply cruise ships docked at the Nassau Cruise Port and supply any excess power to BPL. This LNG-powered plant will produce seventy megawatts (70 MW) of power using LNG as the main fuel source. It also involves the installation of LNG receiving, storage, and regasification infrastructure, along with a high-capacity power transmission cable connecting the plant to Nassau Cruise Port. The open cycle is scheduled to come online in July 2026, while the combined cycle is scheduled to go online in November 2026. The plant will be located on a ten and eight tenths acres (10.8 ac.) tract located within Arawak Cay, which was historically used for port operations. The Project seeks to reduce reliance on traditional fossil fuels, enhance energy efficiency, and support economic development through stable and sustainable energy sources.

The Project description and Scope, along with the specific Construction Methodology, are also outlined in this document. The discussion process was completed to determine the preferred and alternate routes of the LNG transmission cable, as well as all applicable legislation regarding the implementation of The Project.

Baseline Assessments

Baseline assessments were conducted for the physical, biological, and socio-economic environment to record the existing conditions for the proposed area for The Project infrastructure.

Terrestrial assessments conducted show that the site currently consists of one (1) major terrestrial ecosystem, which is an Interior Upland ecosystem with one (1) vegetation class, which was a Human-Altered Environment. A total of twelve (12) species were recorded on the site, including one (1) protected species and four (4) invasive species.

A total of two (2) avian species were recorded during the investigation, all of which were permanent resident breeding species. All species observed are protected under the Wild Birds Protection Act of The Commonwealth of The Bahamas, 1952. All species observed are considered of Least Concern by the International Union for Conservation of Nature (IUCN). No endangered birds were recorded, and one (1) endemic species was observed.

Marine assessments conducted show that the underwater cable route currently consists of three (3) generalized habitats: Sandy Bottom, Hard Bottom, and Seagrass; and five (5) variations: Sandy Bottom with Macroalgae, Sandy Bottom with Seagrass, Silt with Macroalgae, Hard Bottom with Macroalgae, and Hard Bottom with Seagrass. A total of

seventeen (17) species were recorded on the site, including one (6) fish species, two (1) coral species, six (6) other flora and fauna, and eight (4) flora species. There were six (6) marine species observed that are listed on the Convention on International Trade of Endangered Species (CITES) list and/or the International Union for Conservation of Nature (IUCN) Red List; and four (4) species are important to the economy of The Bahamas, are important key stone species for the marine ecosystems or are protected under The Bahamas Legislation.

Physical parameters investigated included hydrology, tides, geology studies, bathymetry, ambient air quality, air temperature, rainfall, noise levels, and climate risks (e.g., hurricanes and fires).

Socioeconomic assessments investigated The Project site demographics, utilities and services, ship transportation, tourist and recreational areas, aesthetics, legal aspects, and visual quality.

Anticipated Impacts and Mitigations

There are anticipated impacts to the physical, biological, and socioeconomic environment due to the construction and operation of The Project.

The anticipated impacts to the physical environment include a decrease in water and air quality, an increase in solid and hazardous waste, an increase in noise and light pollution, and sediment and erosion impacts. Also, risks are associated with climate factors such as hurricanes and fires.

The anticipated impacts to the biological environment include habitat degradation due to land clearing and placement of the underwater cable line, and negative impacts on wildlife.

Socioeconomic impacts associated with The Project include an increase in traffic congestion and accidents, negative impacts on the surrounding neighborhood and community land use, community impacts, job generation, material sourcing, and commissioning and utilization of hospital services.

Long-term negative impacts on the natural resources in the area are not expected to occur because of the proposed construction work. Construction will be closely monitored to prevent contamination of the adjacent terrestrial habitats and disturbances to the nearby communities. Management Plans will detail mitigation measures that must be adhered to by the contractor to ensure protection of the environment.

The purpose of the Arawak Cay LNG Project Environmental Impact Assessment (EIA) is to assess and document existing conditions of The Project area and the potential impacts associated with the proposed Project. The EIA has been designed to assist with achieving the Health, Safety, Social, and Environmental (HSSE) Policy to ensure that all its activities during the construction and operational phases are conducted in a manner that results in minimal

adverse impacts to the environment. The Environmental Management Plan is also outlined in this document to ensure that all activities completed within the construction and operation phases incorporate mitigation measures to avoid, negate, or minimize potential impacts that will be employed by management, staff, and sub-contractors during construction and operation.

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Acronyms and Abbreviations

Ac	Acre
Ar	Argon
Bahamas	Commonwealth of The Bahamas
bar(g)	Bar Gauge
BOG	Boil of gas
BOP	Balance of Plant
DEPP	Department of Environmental Planning and Protection
BIA	Bahamas Investment Authority
°C	Degrees Celsius
CAPEX	Capital Expenditure
CI	Commercially Important
CITES	Convention on International Trade of Endangered Species
CO_2	Carbon Dioxide
cm	Centimeter
cm/s	Centimeter per Second
dBA	A-Weighted Decibels
DEHS	Department of Environmental Health Services
DPP	Department of Physical Planning
E	Endemic Species
EDI	Electrodeionization Plant
EH&S	Environmental, Health, and Safety
EI	Ecologically Important
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
ES	Endangered Species
°F	Degrees Fahrenheit
ft	Foot or Feet
g/L	Grams per Liter
GHG	Greenhouse Gas
GOTB	The Government of the Commonwealth of The Bahamas
GPS	Global Positioning System
GIS	Gas Insulated Switch Gear
HCO	Hydraulic Clearance Optimization system
Hg	Mercury
HIGS	High-Integrity Generator Switchgear
HRSG	Heat Recovery Steam Generator
H_2O	Water
IFC	International Finance Corporation

IGV	Inlet Guide Vanes
in	inch
IUCN	International Union of Conservation of Nature
km	Kilometer
km2	Square Kilometer
km/h	Kilometers Per Hour
kW	Kilowatt
LC	Least Concern (Conservation-IUCN)
LER	Low Energy Relay
LNG	Liquefied Natural Gas
Lp	Sound Pressure Level
m	Meter(s)
m3	Cubic Meter
MAWP	Maximum Allowable Working Pressure
mg/L	Milligrams per Liter
mbar	Millibar
mi	Mile(s)
mi2	Square Mile(s)
mm	Millimeter
MLLW	Mean Lower Low Water
MOW	Ministry of Works
MOEH	Ministry of Environment and Housing
MSDS	Material Safety Data Sheet
msl	Mean Sea Level
µg/m3	Micrograms of Gaseous Pollutant per Cubic Meter of Ambient Air
MW	Megawatts
NB	Nominal Bore
N_2	Nitrogen
N_2O	Nitrous Oxide
NGO	Nongovernmental Organization
NOAA	National Oceanic and Atmospheric Administration
NO_x	Nitrogen oxides
NPEP	New Providence Ecology Park
NT	Near Threatened (Conservation-IUCN)
NTU	Nephelometric Turbidity Unit
OPM	Office of the Prime Minister
O_2	Oxygen
PLC	Programmable Logic Controller
PM	Particulate matter
ppt	Parts per Trillion

PRB	Permanent Resident Breeding
PS	Protected Species
RBDF	Royal Bahamas Defense Force
RBPF	Royal Bahamas Police Force
RO	Reverse Osmosis
RS	Regulated Species
SCADA	Supervisory Control and Data Acquisition
SO_2	Sulfur Dioxide
SFC	Specific Fuel Consumption
SGT	Siemens Gas Turbo
SRB	Summer Resident Breeding
UWR	Uncommon Winter Resident
WB	World Bank
WSC	Water and Sewage Corporation

1.0 Background

The Shore Power for The New Providence Cruise Ship Terminal Via Liquefied Natural Gas, hereafter referred to as the Arawak Cay LNG Project (The Project), will be located on a ten and eight tenths acre (10.8 ac) tract on Arawak Cay.

In 1969, Arawak Cay was constructed from spoils acquired during the dredging of Nassau Harbour, and shipping operations commenced in the 1980s. In the summer of 1994, the Arawak Cay Conch, Fish, Vegetable, and Food Vendors Association was formed, and official leases for stalls were granted in May 2002. From there, activities on Arawak Cay increased with the construction of the Nassau Container Port in 2011. Now, Arawak Cay is not only a shipping hub but is also known for its authentic local cuisines and entertainment.

With New Providence's growing population and the expansion of the Nassau Cruise Port, there has been an increase in energy demands in the northern section of the island. With the advantage of being in a convenient and centralized location, The Project aims to meet these demands by:

- Modernizing the island's energy infrastructure while adhering to the highest standards of environmental sustainability,
- Significantly reducing the island's reliance on traditional fossil fuels,
- Enhance energy efficiency across the island, and
- Support the economic development of New Providence by providing a more stable and sustainable energy source.

The LNG plant is designed to meet stringent safety and environmental requirements, incorporate features to prevent emissions, manage waste, and respond to emergencies effectively. During construction, advanced construction techniques will be employed to minimize disruption to urban activities and ecological systems, with an emphasis on protecting critical habitats and avoiding impacts on existing utilities.

The Government of the Commonwealth of The Bahamas (GOTB), through its Ministry of Energy and Transport, as well as Bahamas Power and Light Company Ltd. (BPL), has awarded the proposed shore power liquefied natural gas (LNG) fueled power plant to be located on Arawak Cay, Nassau, The Bahamas. This generation facility will supply cruise ships docked at the Nassau Cruise Port and supply any excess power to BPL. This LNG-powered plant will produce seventy megawatts (70 MW) of power. The open cycle is scheduled to come online in July 2026, while the combined cycle is scheduled to go online in November 2026.

1.1 Purpose

The Project is an important infrastructure initiative aimed at improving energy supply and resilience at the Nassau Cruise Port. As a key hub for international tourism and maritime

operations, the port plays a crucial role in New Providence's economy. The LNG-generated power will significantly enhance the port's energy efficiency, support sustainable operations, and reduce its reliance on traditional energy sources.

2.0 Project Description and Scope

The Project traverses urbanized areas with moderate road networks and spans sections of coastal environments. The site is located on the northwestern coast of New Providence (GPS Coordinates: 25° 4'56.32"N, 77°21'41.58"W), approximately six and nine tenths (6.9 mi) miles from the Sir Lynden Pindling International Airport (See Figure 1), and two point eight one miles (2.81 mi) away from the Southwest Marine National Park (See Figure 15). The site is currently uninhabited and does not contain any structures.

The Project involves the construction of a thermoelectric Combined Cycle Power Generation plant that will use LNG as its primary fuel. It will include facilities for receiving, unloading, storing, and regasifying LNG. Additionally, The Project will feature an interconnection switchyard and switchgear, cryogenic storage tanks, regasification units, auxiliary safety systems, along with the necessary mechanical and electrical equipment, and associated instruments to enable the import, storage, and conversion of LNG into reusable energy (see Appendix A).

Complementing the plant is the installation of a high-capacity power transmission cable that will run eastward, connecting to the Nassau Cruise Port. This strategically designed cable will provide the cruise port with a reliable and sustainable energy source to power its operations.

The main electrical system includes two (2) electric circuits on 13.8 kV-132 kV, connected to their own step-up transformers and connected in parallel to a Gas Insulated Switch Gear (GIS) of ninety to ninety-five (90 – 95) (TBD later) MVA and further interconnections to the BPL system and to the Cruise Port.

LNG Process

LNG will be burned using a Siemens Energy SGT800/SGen Gas Turbine-Generator. The exhaust of the Gas Turbine is then fed to a single-pressure Heat Recovery Steam Generator (HRSG) unit, which uses natural circulation to produce steam. Steam is then sent to a Siemens Energy Steam Turbine-Generator SST300/SGen6, and the exhaust produced is sent to an Air Cooled Condenser (ACC) or to a conventional Shell and Tube water condenser with a closed, dry-cooling tower circulating water system. This closed chilled water system should be used for a Food Cool Chain (Optional) and cool the air at the intake structure of the Gas Turbine to increase its power and improve efficiency.

Both generators are TEWAC (Totally Enclosed Water to Air-Cooled).

Each of these main components will be supplemented by its own:

- Auxiliaries and mechanical systems
- Electrical equipment
- Control system

In addition to the main equipment of the power plant, there is the Balance of Plant (BOP) equipment.

Figure 1: Site location Map.

2.1 Project Components

The Project components will consist of a Discharge station, LNG storage facility, Regasification system, Demi-plant, Power Plant, and Sub-station (See Figure 2).

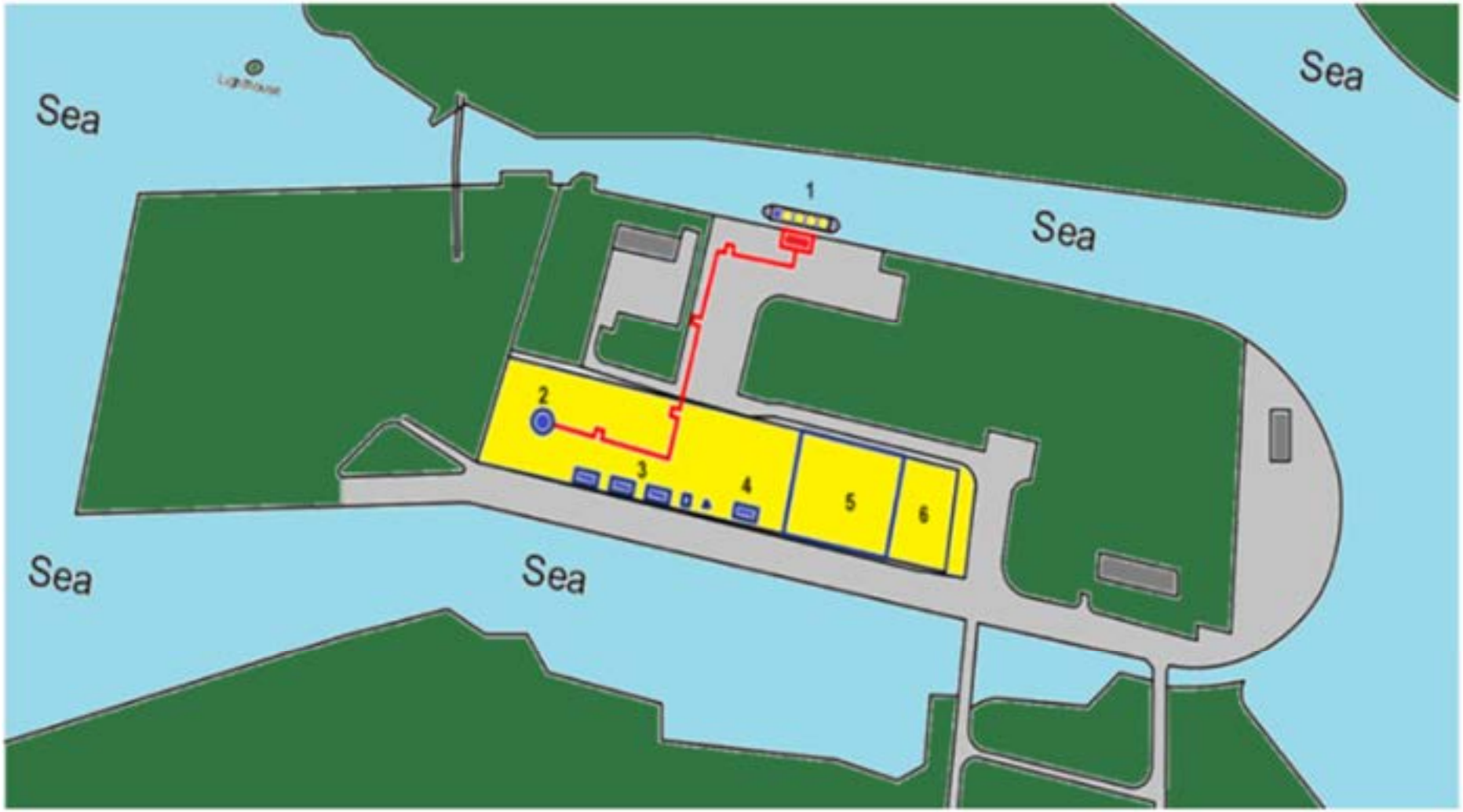


Figure 2: Schematic plot of project components (only as a reference). 1) LNG Discharge 2) LNG Storage 3) Regasification 4) Demi-plant 5) Power Plant 6) Sub-station

2.1.1 LNG Discharge

The LNG discharge area will be where LNG carriers dock to offload cargo from the transport ship. The discharge area already consists of a bulkhead and docking amenities.

The main systems within the discharge area include:

- Ship unloading station.
- Interconnecting and Transfer pipes.

The Ship unloading station will consist of pneumatic valves, manual valves, a Coriolis-type flow meter, and a Drain Drum Assembly.

Pipelines will have to be installed to lead from the discharge area to storage facilities. The LNG pipeline will be eight inches (8") in diameter and twenty meters (20 m.) in length. The pipeline will consist of a five to six (5-6) main band vacuum-insulated double-walled unloading hose, which can handle an LNG flow rate of five hundred cubic meters per hour (500 m^3/hr.).

The Boil-off Gas (BOG) line, which is a pipe system that collects and transports BOG generated within LNG tanks, will be three inches (3") in diameter and twenty meters (20 m.) in length.

Final connection from the Ship to the unloading station shall depend on the types of ships used and shall take into account the tools and equipment for the connection.

Photo 1: Example of an LNG carrier

Photo 2: Example of the Unloading Station

2.1.2 Water Treatment and Demineralization Plant

The water treatment plant will convert seawater to process water to be used in the demineralization plant. The main components of the water treatment plant include:

- Desalination Plant.
- Pre-treated water Tank.
- Demineralization Plant.
- Service water and Fire Water System.

2.1.2.1.1 Desalination Plant

Seawater will be sourced from open free (submerged) structures or by an intake well with suction pumps. Seawater will be pretreated, where the small solid particles, sediments, and contaminants will be removed before being pumped through reverse osmosis membranes.

2.1.2.2 Demineralization-plant

After the desalination process, the water will be demineralized to make up the feed water to the Heat Recovery Steam Generator. Water will then be stored in a demineralized water tank.

The main components of the demineralization plant are:

- Service water feed pumps system.
- Pre-treatment plant.
- Pre-treated water tank.
- Demi-water treatment plant.
- Electrodeionization (EDI) plant.
- Demi-water tank.
- Control system Interphase.

2.1.2.3 Service Water and Fire Water System

Processed water from the pre-treatment process, as well as the reverse osmosis plant, will be used for service and fire-fighting water. The fire protection system is made up of the following main equipment and subsystems:

- A storage tank, shared with the service water system.
    - To ensure the availability of water in the quantity required by the fire system, the intake nozzle for the service water system is located at a height in the tank above the required level corresponding to the capacity required for firefighting.
- A main fire pump driven by an electric motor.
- A diesel-powered fire reserve pump.
- A pump for pressurizing the fire network (jockey) driven by an electric motor.
- Network of pipes for feeding hydrants, hoses, and sprinklers.
- Carbon Dioxide (CO^2) extinguishing system, for fighting possible fires in facilities such as components of the gas turbo-generator and the steam turbine-generator.
- FM-200 clean agent extinguishing system in the control room and server room.
- The Integral Fire Protection System, which is made up of a Central Control Panel, local panels, and fire detectors that allow the activation of extinguishing systems and alarms in the event of an emergency.

2.1.3 Power Plant

The Power Plant will comprise one (1) combined cycle unit in a 1-1-1 configuration with an output of fifty-seven megawatts (57 MW). The Siemens SCC800 unit configuration comprises:

- One (1) natural gas-fired gas turbine (GT). The model of the turbine is ST800
- One (1) Te-wac cooled four-pole generator, for the GT.
- One (1) steam turbine (ST). The model of the steam turbine is SST 300.
- One (1) Te-wac cooled four-pole generator, for the ST.
- One (1) horizontal type, single or dual pressure, non-reheat water/steam cycle Heat Recovery Steam Generator (HRSG).

The Power Station will be connected to a one hundred and thirty-two kilovolts (132 kV) Gas Insulated Switchgear (GIS), and through this switchgear, it is connected to the Cruise Port and the Nassau Island grid.

2.1.3.1 Gas Turbine-Generator

The Siemens Gas Turbo-generator, SGT-800, will be operated in simple or combined cycle mode, where the hot gases produced by the combustion of LNG natural gas are sent through a diffuser duct towards a diverter damper (bypass stack). The gas will then be sent to the

Heat Recovery Steam Generator (HRSG) or expelled towards the atmosphere through a By-pass chimney.

The following are the SGT-800 and its auxiliary system, as per the SGT-800 Scope of:

- Air intake system (Filtering & Cooling (if applicable)). Silencer and air quality control.
- Compressor and Expansion (Casing, rotor, bearings, diaphragms, blades) descriptions.
- Exhaust gas system (Diffuser).
- Electric generator & auxiliaries, SEE (excitation), AVR, SFC (if applicable).
- Supervision and control system (GT instrumentation).
- Fire protection system.
- Fuel Gas System (meter) and fuel Manifold. Burners and combustion chamber description.
- Fuel Gas Throttle valves.
- Lubrication and lifting oil system of the Gas Turbo-generator.
- Lube oil cooler system.
- Hydraulic Oil supply system (Vanes & fuel gas actuators).
- Inlet Guide Vanes (IGV).
- Pneumatic for blow-off system and actuators.
- Hydraulic Clearance Optimization system (HCO).
- Drain system.
- Compressor cleaning system (Manual or Automatic).
- Secondary air system.
- Pneumatic air block system for fuel gas, including actuators.
- Combustion Chamber Instrumentation System.
- Instrument air system.
- Generator instrumentation.
- HVAC.
- Noise abatement control.
- Start-up system.
- Step up transformer.
- Auxiliary Transformer.
- LER (Low Energy Relay) and auxiliary GT equipment.
- HISG Generator Switch generator.
- Transformer protection system.
- Interconnecting piping and cabling.

Figure 3: SGT-800 57MW Classic

2.1.3.2 HRSG & Bypass Chimney-Diverter Damper

The HRSG receives the exhaust gases from the gas turbine through a Diverter-Damper. The HRSG will be a single-pressure pressure and provide the steam at the conditions required for the operation of the steam turbine.

The bypass diverter-damper will be able to operate in the mode of partial opening that permits combustion gases to pass through the HRSG and to the by-pass stack simultaneously.

The following are the main systems of the HRSG & Bypass Chimney-Diverter Damper:

- HRSG and auxiliary systems:
  - Main steam system, economizer, evaporator, superheater.
  - High-pressure steam temperature control.
  - Drum level control.
  - Condensate water preheating system.
  - Drainage system.
  - Safety valves.
  - HRSG Diverter Damper operational coordination.
  - Control operation & protection coordination
- Chemical dosing system.
- Sampling system.
- Continuous emissions monitoring system.
- Stack by-pass.
- De-aerator.
- Steam vents and drainage system.

- Non-return valves.
- Main stack.
- HP Feed water pumps.
- Control System Interface.
- Interconnecting piping and cabling.

2.1.3.3 Steam Turbine-Generator

The Siemens Steam Turbo-generator, SST-300, will receive steam from the HRSG. The steam turbine will convert the thermal energy of the steam into mechanical work to move electrical generation which will transform this work into electrical energy. The SST-300 is a single casing turbine, with stop (emergency) and Control valves, reaction-type blades, exhaust temperature and pressure control protection. The ST exhaust steam is condensed in an Air-Cooled Condenser (ACC).

Figure 4: SST-300 steam turbine

The Steam Turbine / Generator (SST-300) and its auxiliary systems consist of:

- Casing and rotor, blades, and diaphragms construction.
- Seal component system.
- Bearings (support and axial thrust).
- Control and Trip Oil System.
- Shaft Monitoring System.
- Turning gear Device System.
- Jacking oil system.
- Drainage system.
- Gland Steam system.
- TEWAC Electric Generator.

- Main steam by-pass system.
- Speed and load control (Pressure control and sliding pressure operation).
- Supervisory and control operation instruments.
- DCS integration and connection.
- Connection with condenser.
- Electrical generator operation supervisory system.
- Automatic Voltage regulation.
- Neutral grounding system.
- Main Terminal box (line and neutral equipment).
- Exhaust system.
- Electrical/Control/Instrumentation Package.
- Lube Oil Package w/ main, auxiliary & emergency pump.
- Steam turbine enclosure.
- GSU Step Up Transformer.
- Generator Circuit Breaker.
- Control System Interface.
- Interconnecting Piping and Cabling.

2.1.4 Regasification System

The regasification system will receive LNG from carriers through an eight inch (8") vacuum insulated pipeline and convert it back into natural gas.

The main components of the regasification system include:

- LNG Storage Tanks.
- Pump Station.
- Ambient Air Vaporizer.
- Buffer Tanks.
- Gas Nitrogen Separator.

2.1.4.1 LNG Storage

The LNG storage facility will consist of large-scale industrial holding tanks used to store LNG. There will be approximately ten (10) vacuum and perlite insulated cryogenic tanks which have a gross volume of one thousand five hundred cubic meters (1,500 m^3) each.

Photo 3: Example of the storage tanks

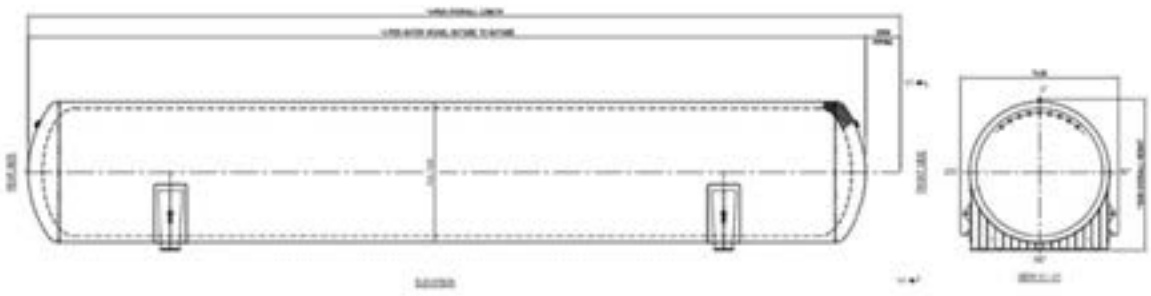


Figure 5: Schematic of the storage tanks

2.1.4.2 Pump Station

The pump station will consist of two (2) working and one (1) standby cryogenic pot-mounted submerged process pumps. Each pump will have a capacity of up to two hundred and fifty-five liters per minute (255 LPM) at three hundred and sixty pounds per square inch (360 psi) delivery pressure. The pump station will also include a skid with valves & instruments.

Photo 4: Example of the pump station

2.1.4.3 Ambient Air Vaporizer

An Ambient Air Vaporizer is a heat exchanger that vaporizes liquefied gas using absorbed heat from the ambient air. The vaporizer will be suitable for eight thousand (8000) USG/Hour.

Photo 5: Example of an LNG Ambient Air Vaporizer

2.1.4.4 Buffer Tank

The buffer tank will be used to manage and re-liquefy the BOG that naturally occurs from stored LNG. The buffer tank will act as a pressure reservoir and provide a stable supply of gas at a consistent pressure to meet localized demand. The buffer tank will have a capacity of fifty cubic meters (50 m^3) and be provided before the Natural Gas Pressure Control Valve.

2.1.5 Sub-Station

The sub-station will be designed to convert the higher voltages produced by the LNG Plant to lower voltages suitable for consumption.

The GT and ST generators are connected to the step-up transformers via isolated phase bus ducts. The GT-circuit is equipped with generator breaker or a High-Integrity Generator Switchgear (HIGS) system. This set up enhances the power system, improves protection and an increase operating flexibility.

Electrical engineering basic design for Arawak Cay Power Plant considers the following within the scope:

- An electric generator rated at seventy mega volt-volt-ampere (70 MVA) at twenty kilovolts (20 kV), driven by a gas turbine.
- An electric generator rated at thirty mega volt-volt-ampere (30 MVA) at twenty kilovolts (20 kV), driven by a steam turbine.
- One (1) one hundred and thirty-two kilovolt (132 kV), step-up transformer connected to the gas turbine generator.
- One (1) one hundred and thirty-two kilovolt (132 kV), step-up transformer connected to the steam turbine generator.

The one hundred and thirty-two kilovolt (132 kV) transmission from the gas and steam turbine step-up transformers, is provided by one (1) or two (2) overhead lines, which interconnect with the new GIS 132 kV system.

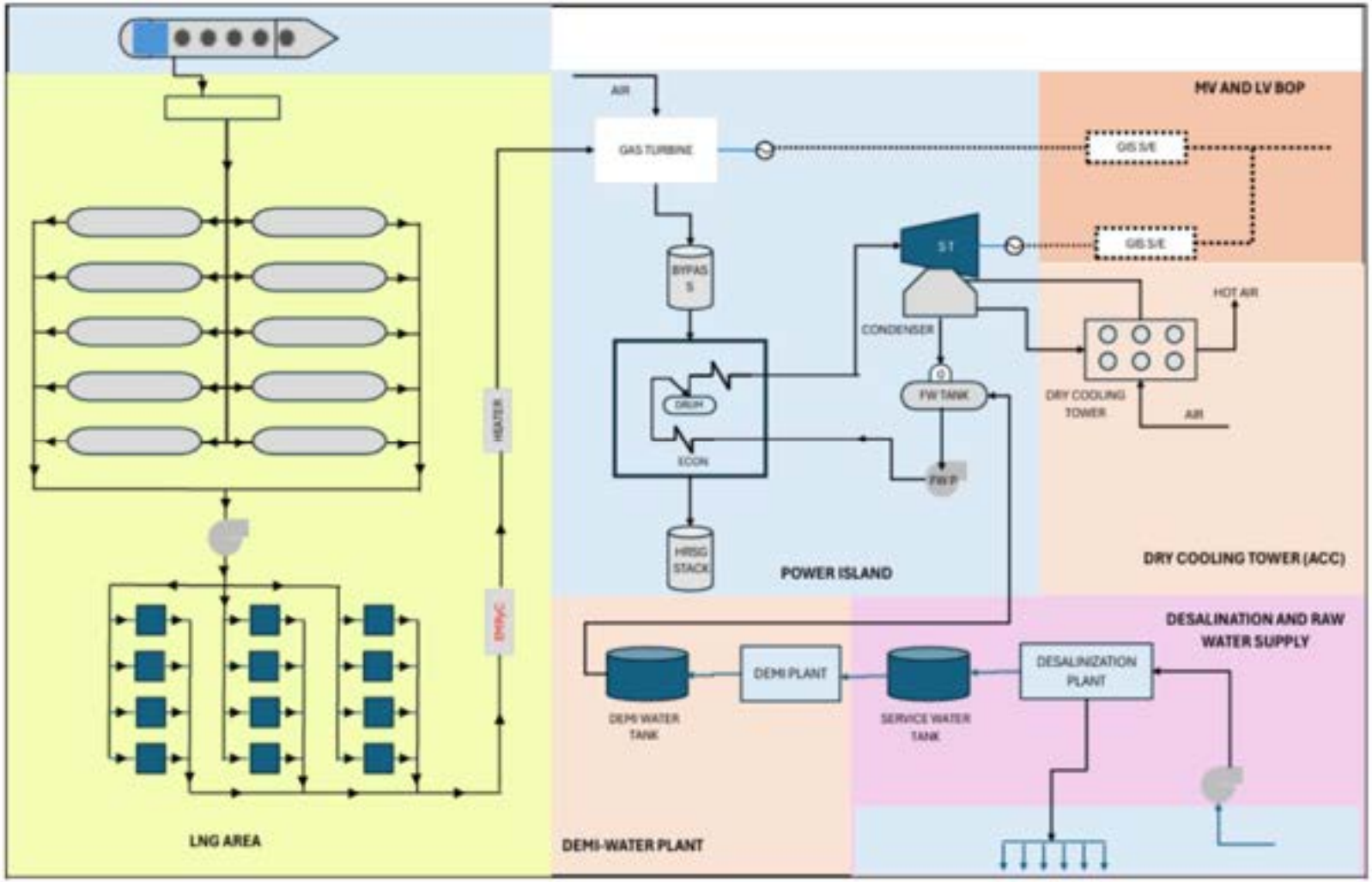


Figure 6: Block Diagram of Arawak Cay Power Plant project

2.2 Construction Methodology

Below is a summary of the methodology that will be utilized during the construction of The Project. Full construction methodology will be outlined in the Arawak Cay LNG Project Environmental Management Plan (EMP).

2.2.1 Site Preparation

The initial phase of construction at Arawak Cay will focus on preparing the site for the LNG plant. Any existing structures, debris, or vegetation must be removed, ensuring minimal disruption to the surrounding environment and the nearby marine system. Access roads and temporary facilities will be established to support construction and operation works, as well as the public. Utility mapping will be conducted to identify and relocate existing underground pipelines that may interfere with construction. Soil testing and geotechnical investigations will be conducted to ensure ground stability for heavy industrial vehicles and facility infrastructure.

2.2.2 Design and Engineering

The LNG plant and power transmission system were developed through architectural designs, structural engineering plans, mechanical and electrical systems, along with safety features such as fire suppression and emergency systems. The route mapped for the power transmission cable from Arawak Cay to Nassau Cruise Port has been planned considering factors like terrain, existing infrastructure, and environmental probabilities. Engineering plans will specify the type of cables, insulation, and installation methods suitable for both underground and underwater segments. The design phase will also involve obtaining all necessary permits and approvals from regulatory bodies.

2.2.3 Construction of the LNG Plant

The establishment of the foundation and structural support for the LNG storage tanks, processing facilities, and auxiliary buildings will initiate the construction process. Specialized equipment will be installed, including cryogenic tanks, compressors, vaporizers, and control systems. All construction activities will follow safety controls to handle hazardous materials and high-pressure systems. Quality assurance measures will be in place to ensure all components abide by specific design and industry standards. The local authorities and workers on site will coordinate logistics for transporting large equipment on The Project site, ensuring adherence to noise limits and work-hour requirements.

2.2.4 Backfilling and Compaction

Once the underground cables are laid, trenches will be backfilled with the appropriate materials (e.g., sand, fine gravel) to protect the cables and provide stability. The backfill material will be compacted in layers to prevent future ground settlement, which could compromise the integrity of the cables or surrounding infrastructure. This process will be conducted carefully to avoid damage to the cables and maintain the original contour of the

land. In areas where the cables crossroads or other paved surfaces, the final layer will be restored to match the existing pavement, ensuring a seamless repair.

2.2.5 Quality Control and Testing

Rigorous testing will be conducted on both the LNG plant and the power transmission system to verify that all components are functioning correctly and safely. This includes pressure testing of LNG storage tanks and pipelines, leak detection, electrical testing of cables, and system integration tests. Safety systems such as alarms, shutdown mechanisms, and fire suppression equipment will be tested under various scenarios. Inspections will be carried out by independent experts to certify compliance with all relevant standards and regulations. Any deficiencies identified will be addressed promptly before the commencement of operations.

2.3 Description of Project Alternatives

The purpose of discussing project alternatives in an EIA is to provide a reasonable range of potentially viable options that can avoid or significantly reduce any major environmental impacts of a project. This is even if these alternatives would impede to some degree the achievement of The Project objectives or incur higher costs. The range of alternatives describes those that could feasibly accomplish most of the basic objectives of The Project and could avoid or substantially lessen one or more of the significant effects.

2.3.1 Alternative Cable Routes

While Arawak Cay is the designated location for the LNG terminal, alternative routes for the cable connecting the LNG plant to Nassau Cruise Port were explored. Both a submersible cable alignment and underground cable alignment was considered with each route type having two (2) options:

Submersible Cable Alignment:

- Route 1: Nearshore Option
- Route 2: Offshore Option

Underground Cable Alignment

- Route 3: Commercial Option
- Route 4: Residential Option

Route 1: Nearshore Option

This route to the cruise port follows a submarine cable alignment. The Nearshore Option, outlined in black (see Figure 7), consists of a one thousand, nine hundred and twenty meter (1,920 m.) cable line that starts on the southern side of the LNG Plant and heads east, running along the southern side of Arawak Cay to the Nassau Cruise Port.

Route 2: Offshore Option

This route to the cruise port follows a submarine cable alignment. The Offshore Option, outlined in yellow (see Figure 7), consists of a one thousand three hundred and fifty meter (1,320 m.) cable, running from the west side of the LNG plant to the Port.

Route 3: Commercial Option

This routes consist of an underground cable alignment that runs through the commercial areas. The underground cable, outlined in cyan (see Figure 7), will start from the southern side of the LNG plant. It will run south along Arawak Cay Drive, then head east onto West Bay Street, followed by a turn onto Marlborough Street. It will proceed onto Navy Lion Road, continuing onto Wood Rogers Wharf and to the cruise port.

Route 4: Residential Option

This routes consist of an underground cable alignment that runs through the predominantly residential areas. The underground cable, outlined in pink (see Figure 7), will start from the southern side of the LNG plant. It will run south along Arawak Cay Drive, then turn west onto West Bay Street. Next, it will turn onto Chippingham Road, proceeding south before turning onto Infant View Road heading east. The cable will then turn onto Nassau Street, heading north, followed by a turn onto Delancy Street, continuing east. After that, it will turn north onto West Street, then onto Marlborough Street. It will proceed onto Navy Lion Road, continuing onto Wood Rogers Wharf and to the cruise port.

Chosen Route for the Arawak Cay LNG Transmission Cable

The chosen route for the Arawak Cay LNG Project Transmission Cable is the offshore submersible cable route (yellow line in Figure 7). This route is being considered as the primary route because it has a shorter cable length, is further offshore, and is located in a more easily accessible area for cable placement and maintenance.

Route 1 (nearshore submersible cable route) was not chosen due it having a longer cable length and it being closer to the shore with can pose an concerns for locals and tourist using the area during the construction phase.

Route 3 (commercial underground cable route) and 4 (residential underground cable route) were not chosen due to them consisting of numerous existing utility infrastructure which can potentially be disrupted during placement of the transmission cable. Also installation of a cable along either of the underground routes will cause unmanageable traffic disruptions in commercial areas (Route 3) or residential areas (Route 4).

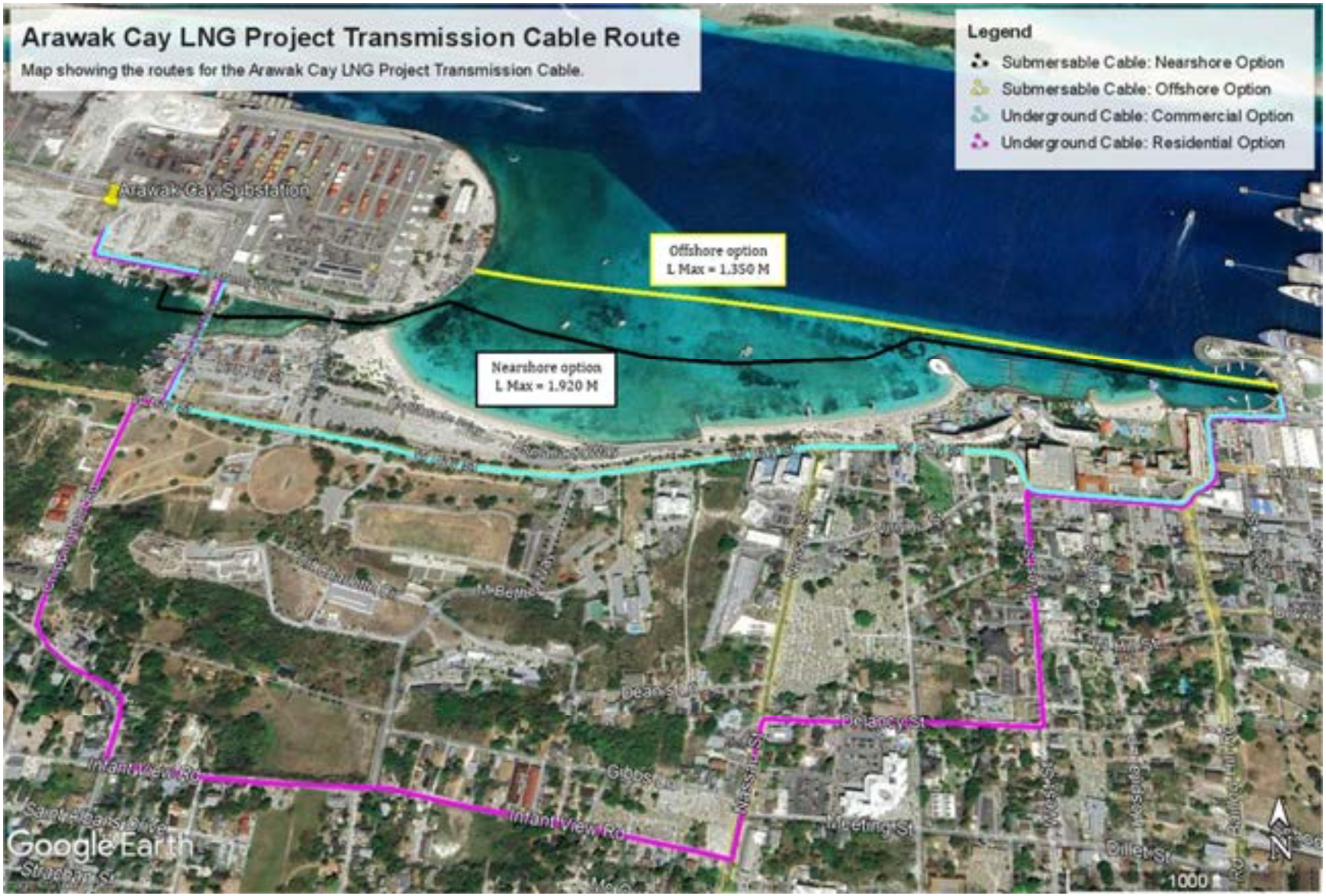


Figure 7: Arawak Cay LNG Transmission Cable Routes

2.3.2 The "No Action" Alternative

The "no-action" alternative would result in no impact on the marine and terrestrial component of this development, but would not necessarily prevent any or all future developments for the same area. No action may also limit the long-term growth of the area in comparison with similar places in The Bahamas and elsewhere in the Caribbean, which are larger and have a greater range of amenities. No additional significant impacts to the natural environment are likely to occur; however, the "no action" alternative would not provide the economic stimulus of the further development of Arawak Cay. With the significant level of expansion already approved, the "No Action" alternative has not been further considered.

3.0 Environmental and Social Baseline Assessment

A comprehensive baseline assessment has been conducted for the LNG plant and across the cable route, which starts at Arawak Cay and leads all the way to Nassau Cruise Port. The baseline assessment covers aspects of the physical, biological, and social environment.

This baseline evaluation covered key marine, botanical, and avian parameters, ensuring a thorough understanding of the existing flora, fauna, epifauna, and ecological conditions observed on The Project site. Physical aspects of the environment, such as ambient air quality, hydrology, geology, and soil types and ecotones, were also analyzed, providing detailed insights into the environmental characteristics of the sites, such as the presence of human-altered areas, coastal zones, and any other potential habitats.

Drone and satellite imagery were utilized to capture high-resolution data for the area, with the imagery providing critical information on topography, vegetation cover, and site conditions, aiding in the planning and management of current onsite conditions all the way through to construction activities.

3.1 Physical Aspects

The physical aspects of The Project site include non-living components such as climate, tides, topography, hydrology, air quality, noise quality, and bathymetry. These factors are crucial for assessing the environmental baseline and understanding how The Project may impact the surrounding area. All were evaluated and are essential for both construction and operational phases to ensure sustainable development.

3.1.1 Land Use

The current land use for The Project spans a brownfield site at Arawak Cay, which has been informally utilized as extra storage space for the adjacent port operations. This area, characterized by its industrial nature and proximity to existing maritime infrastructure, provides a strategic location for the LNG facility. From Arawak Cay, The Project route extends eastward, leading directly to the Nassau Cruise Port. The cruise port itself is a key driver of

Nassau's economy, supporting international tourism and maritime commerce. This existing land use context underscores the importance of integrating The Project into the area's economic framework, while ensuring that construction and operation are aligned with urban and industrial activities, thus minimizing disruption to this vital economic zone.

3.1.2 Climate

The Bahamas enjoys a subtropical climate of wet warm summers and cooler dry winters, identified by the Köppen climate classification as 'Aw'. Its geographical position in the Atlantic Ocean, off the southeast coast of Florida, allows it to enjoy warm temperatures and abundant sunshine, providing stunning scenic beauty throughout the year.

Average temperatures range between 75°F to 90°F, with cooler temperatures occurring in the northern islands and warmer conditions in the southern islands. The region is influenced by the trade winds, which moderate the heat, providing pleasant breezes. Rainfall is seasonal, with a wetter period from May to October, corresponding with the Atlantic hurricane season, which poses a significant risk to the islands. The entire Bahamas experiences tropical cyclones and is located in the Atlantic hurricane belt. The dry season typically lasts from November to April, with less frequent rainfall. Hurricanes and tropical storms are common during the summer and early fall, impacting the islands' weather patterns, infrastructure, and ecosystems.

When considering climate change as it relates to The Bahamas, it is important to note that the country is an archipelago of small islands, most of them uninhabited, and that more than eighty percent (80%) of the land surface is only a meter or less above mean sea level. The natural resources of the country are very limited, and the economy is built on tourism and services. Bahamians, like other island people, have historically had a close personal relationship with the land and the sea. Until the advent of modern tourism and banking industries, most Bahamians relied on these resources of both land and sea for survival.

3.1.2.1 Air Temperature

Throughout the year, there is a significant variation in different weather parameters. Temperatures fluctuate from 78.1°F in January to a tropical 89.8°F in August. Along with the temperatures, sea temperatures also see a similar variance, from 73.9°F in February to 86°F in August. The hours fluctuate marginally due to the country's location being close to the equator, resulting in relatively uniform daylight, between ten point six hours to thirteen point seven hours (10.6 hrs - 13.7 hrs). One can expect between six point nine hours to nine point two hours (6.9 hrs - 9.2 hrs) of sunshine throughout the year, with an ultraviolet index marking the range from eight to eleven (8 – 11), which signifies a high to extreme risk of harm from unprotected sun exposure.

Figure 8: Nassau Average Temperature

3.1.2.2 Winds

Historically, the winds in The Bahamas are influenced by the Northeast trade winds and the occasional impact of tropical weather systems. The trade winds are relatively dry and yield fair weather cumulus clouds with long periods of sunshine. During late October into early May, the trade winds flow from the east and northeast, being interrupted by cold fronts which move south and southeast.

3.1.2.3 Rainfall

Rainfall in Nassau sees a dramatic variation with the turn of seasons, ranging from a moderate forty-seven millimeters (47 mm) in January to a heavy two hundred and thirty-six millimeters (236 mm) in August. Correspondingly, the number of rainfall days ranges from six (6) days in March and April to nineteen (19) days in August. The north and north central receive fifty to sixty inches (50-60 in) of rainfall annually.

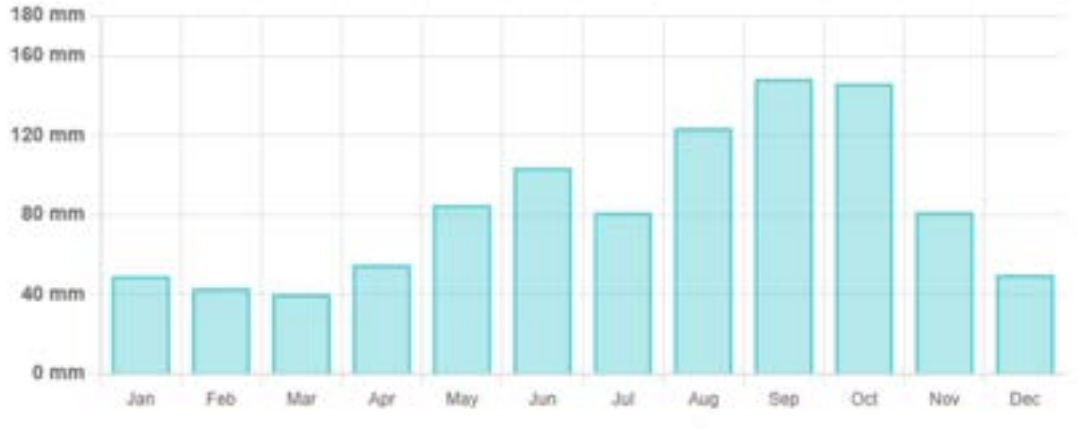


Figure 9: Nassau Average Precipitation

3.1.2.4 Hurricanes

The Bahamas is located within the Atlantic Tropical Cyclone basin. This basin includes much of the North Atlantic, the Caribbean Sea, and the Gulf of Mexico. On average, six to eight (6 - 8) tropical storms form within this basin each year. Low-lying islands and cays in The Bahamas are susceptible to high winds, heavy rainfall, storm surges, and flooding caused by these severe weather events, which can result in significant damage.

According to data from The Bahamas Department of Meteorology, a total of two hundred and twenty-four (224) hurricanes and one hundred and twenty-one (121) tropical storms passed within one hundred miles (100 mi) of The Bahamas from 1886 to 2022 (137 seasons). The majority of these storms occur in August, September, October, and November, with September being the most frequent month for hurricanes and October being the most frequent month for tropical storms. Recent data from the National Hurricane Center (NHC) shows that forty-seven (47) hurricanes, tropical storms, and tropical depressions affected The Bahamas between 2001 and 2022. Of these, six (6) were Category five (5) hurricanes on the Saffir-Simpson Hurricane Wind Scale, which categorizes hurricanes based on their sustained wind speed (See Table 17). In 2016, The Bahamas was impacted by Hurricane Matthew, with the islands of New Providence, Andros, and Grand Bahama receiving severe damage in some coastal areas. In 2017, The Bahamas was impacted by Hurricane Irma. Significant damage occurred on the island of Great Inagua; Crooked Island was impacted as well. The Bahamas was not hit by any hurricanes in 2018; however, in 2019, significant areas of the islands of Abaco and Grand Bahama were devastated by Hurricane Dorian. Hurricane Dorian was one of the strongest Atlantic hurricanes on record, with maximum sustained winds of one hundred and seventy-eight miles per hour (178 mph) and a minimum central pressure of nine hundred and ten millibars (910 mbar). Water levels reached up to two point one meters (2.1 m.) above ground level on the western end of Grand Bahama Island, with even higher levels reported farther east on Grand Bahama Island and on the Abaco Islands.

The Inter-American Development Bank estimated that Hurricane Dorian left over twenty-nine thousand (29,000) people homeless or jobless. The Bahamas has not been affected by any hurricanes from 2020 through 2023. The formation of these storms and possible intensification into mature hurricanes takes place over warm tropical and subtropical waters. Eventual dissipation or modification typically occurs over the colder waters of the North Atlantic or when the storms move over land and away from the sustaining marine environment. The official hurricane season lasts from June 1st to November 30th.

3.1.3 Tides

In the general vicinity of the island of New Providence, the tides are semi-diurnal with an average range of zero point seven five meters (0.75 m) and a tidal period of approximately twelve point four hours (12.4 hrs).

3.1.4 Topography

The topography of Arawak Cay is generally flat, with gently undulating limestone bedrock, human-altered environments, and industrial areas. The Cay is primarily characterized by reclaimed land with flat, compacted surfaces, making it suitable for industrial and commercial activities.

3.1.5 Hydrology

In The Bahamas, the physical hydrology and water resources are directly correlated due to the lack of true rivers. Generally, there is nowhere on the islands of The Bahamas where groundwater cannot be met in holes that penetrate three meters (3 m) below sea level. Water is always met in the range to zero-to-zero point nine meters (0 to 0.9 m) above sea level.

Hydrological Investigation

A water sample was collected on September 18th, 2024, from the coastal zone along the northern shoreline of Arawak Cay (see Appendix B). Samples were taken at a depth of one to two feet (1-2 ft.) Laboratory analysis indicated low nitrate levels, measured at 1.0 milligram per litre (mg/L) (see Table 1).

Table 1. Arawak Cay Project Hydrology Analysis Results

Arawak Cay Project Hydrology Analysis Results	
pH	7.90
Total Dissolved Solids (ppm)	32,800
Salinity (ppm)	12,600
Total Hardness (ppm)	1,197.7
Appearance	Clear

Odor	None
Nitrate (ppm)	1.0
Turbidity (FNU)	1.0

The results suggest that the area is not subject to significant nutrient loading, which is typically associated with pollution from wastewater or agricultural runoff. While the water quality does not meet the World Health_Organization (WHO) standards for human consumption, it remains suitable for supporting marine life.

There are no freshwater resources on the Arawak Cay site; however, care must be taken to avoid contamination of nearby marine ecosystems, especially during construction activities at the proposed LNG generation site. Groundwater in the area is brackish to saline, further confirming the absence of a potable water source and emphasizing the importance of managing surface runoff and construction-related discharges to protect coastal water quality.

3.1.5.1 Hydrological Recommendations

A hydrogeological and coastal survey of Arawak Cay confirmed no freshwater resources, with groundwater classified as brackish to saline. This is consistent with the site's artificial fill composition and coastal location, which limit the development of natural freshwater groundwater systems typically found on other parts of the island. Proposed structures are expected to have a low impact on water resources if built to match existing environmental conditions.

3.1.6 Geotechnical Studies

3.1.6.1 Geotechnical Investigation

The site exploration was carried out between December 20, 2024, and January 9, 2025 (See Appendix C). There were seven (7) boreholes and six (6) test pits drilled, revealing the presence of groundwater at about nine feet (9 ft.) below grade level. The subsurface contains varying levels of limestone and sandy limestone fill, with some layers exhibiting organic material and cavities.

The upper layer contains sandy limestone fill thirty-six to fifty-six inches (36-56 in.) thick with blow counts averaging forty-four blows per foot (44 bpf.). The intermediate layer contains less dense sandy limestone fill down to nine to ten feet (9-10 ft.), and beneath groundwater, there was a mixture of sand and limestone fill to thirty-two feet (32 ft.).

3.1.6.1.1 Foundation Recommendations

Shallow foundations – for footings placed at least four feet (4 ft.) deep, an allowable bearing capacity of three thousand pounds per square foot (3,000 psf.) is recommended.

Deep Foundations – Augered Cast-In-Place (ACIP) piles, twenty-four inches (24 in) in diameter and thirty-five feet (35 ft.) deep, are suggested to support the proposed structures. These piles should have an allowable compressive load of two hundred and fifty kips (250 kips).

3.1.6.1.2 Pavement and Drainage

Pavement areas should be constructed with at least six inches (6 in) of compacted fill, and proper surface drainage should be incorporated to avoid excessive moisture accumulation.

3.1.6.1.3 Building Pad and Earthworks:

All surface vegetation and unsuitable material should be removed, and imported limestone fill should be used for the engineered fill, compacted to ninety-five (95%) of the maximum Modified Proctor dry density.

3.1.6.1.4 Slope and Stability

No major concerns regarding slope stability were identified. However, for excavated slopes, a minimum 2H:1V ratio is recommended to avoid failure.

3.1.6.1.5 Lateral Design Parameters

For retaining walls and equipment pads, the recommended soil density is ninety-five pounds per cubic foot (95 pcf.), with a friction angle of twenty-seven degrees (27°).

3.1.6.1.6 Limitations and Recommendations

Additionally, soil during construction may differ from that observed during the investigation, and recommends further drilling to verify geophysical anomalies.

In conclusion, the site is deemed suitable for development, with specific recommendations for foundation types, earthworks, and further investigations into geophysical anomalies.

3.1.6.2 Ground Penetrating Radar (GPR) Survey

A GRP survey mapped anomalies with the fill, such as voids, boulders, and possible erosion features (see Appendix D). Most anomalies were small (less than three feet (3 ft.) wide) and were scattered throughout the site. There were thirteen (13) medium anomalies (three to five feet (3 ft.-5 ft.) wide) identified at around eight feet (8 ft.) deep, near the groundwater table. Two (2) larger anomalies, five to ten feet (5 ft-10 ft.), were identified with similar depth and proximity.

Most anomalies are believed to be due to heterogeneities in the limestone fill, like boulders or small voids. The medium and large anomalies, located near the water table, may indicate areas of erosion or the potential origin points for fill raveling.

These anomalies suggest the presence of larger voids or boulders within the fill that could affect future construction. However, further investigation of the larger anomalies is

recommended through borehole drilling to confirm their nature and determine the potential impacts on foundation design.

3.1.7 Air Quality

The existing ambient air quality in The Bahamas is affected by strong easterly trade winds for most of the year. General windy conditions during the year tend to transport emissions from sources located on the Islands out over the water, rather than allowing them to accumulate and concentrate in ambient air over areas of population.

3.1.8 Bathymetric Studies

The Bathymetric survey images illustrate detailed underwater topography using contour lines and depth measurements. These visuals are based on data collected via a single-beam echo-sounder technology and are referenced to Mean Lower Low Water (MLLW) for vertical measurements and WGS84 UTM Zone 18N for horizontal positioning. These maps help identify navigable and non-navigable zones, such as areas with depths of around two (2) feet, which are marked accordingly to guide marine operations and infrastructure planning.

Bathymetric data were gathered, providing a comprehensive spatial understanding of the seabed within the marine area, highlighting features like channels, shallow zones, and underwater gradients (See Appendix E).

3.2 Biological Environment

3.2.1 Botanical Survey

Field studies were conducted on the 1st of September 2025 to assess the terrestrial ecosystem of the site. A two (2) person team consisting of JSS Consulting team members conducted the assessment.

3.2.1.1 Methodology

Vegetation types were mapped and verified by walking along the site's interior and perimeter, utilizing established footpaths, roadways, and cleared pathways that navigated through vegetation. Vegetation Type taxonomy was based on Areces et al. (1999). Vascular plant species occurring in each vegetation type were recorded and used to compile a floral list (See Table 2). Plant taxonomy was based on Correll and Correll (1982). The presence, location, and abundance of vascular species listed under the National Invasive Species Strategy for The Bahamas (2013) and the Protected Trees Order (2021) were noted and tagged when encountered.

3.2.1.2 General observations

The weather conditions on September 1st, 2025, were partly cloudy with temperatures recorded to be in the low 90s. Field biologists noted the presence of trash surrounding The Project site and noise pollution caused by the trucks that frequent the area (See Photo 6). Heavy machinery and site workers were also observed on The Project (See Photo 7-8).

Photo 6: Trash observed on The Project site.

Photo 7: Heavy machinery on The Project site.

Photo 8: Site workers and heavy machinery observed on The Project site.

3.2.1.3 Result

3.2.1.3.1 Habitat Description

The terrestrial site contains one (1) terrestrial ecosystem, an Interior Upland. In addition to this, there was also one (1) vegetation class observed on the site, a Human Altered Environment.

Site topography can be described as relatively flat, with sandy limestone substrate. Vegetation growth can be described as secondary growth throughout the entirety of The Project site.

3.2.1.3.1.1 Interior Upland

There is one (1) interior upland vegetation type observed on The Project site, a human-altered environment.

3.2.1.3.1.1.1 Human-Altered Environment

Human-altered environments are those where the natural habitat has been altered or degraded by human involvement. These habitats are primarily composed of regenerative, pioneer, and invasive species. This vegetation type is observed surrounding the cleared

project area that is currently fenced off. It contains flora species such as Jumbay (*Leucaena leucocephala*), Jasmine Vine (*Jasminum fluminense*), and Morning Glory (*Ipomoea indica*).

3.2.1.3.2 Vegetation Map

Figure 10: Vegetation Class distribution map on the Arawak Cay LNG Facility.

3.2.1.3.3 Species List

Botanical and terrestrial fauna surveys were conducted to form a species list. The presence and location of vascular and fauna species observed were recorded.

Table 2: Botanical Species List

Family	Common Name	Botanical Name	Location (HAE)
Fabaceae	Jumbay	*Leucaena leucocephala*	✓
Asteraceae	Shepard Needle	*Bidens alba*	✓
Verbenaceae	Capeweed	*Phyla nodiflora*	✓
Oleaceae	Jasmine Vine	*Jasminum fluminense*	✓
Verbenaceae	Rat's Tail	*Stachytarpheta jamaicensis*	✓
Convolvulaceae	Morning Glory	*Ipomoea indica*	✓
Fabaceae	Monkey Tamarind	*Mucuna puriens*	✓
Asteraceae	Jack Ma D	*Koanophyllon villosum*	✓
Euphorbiaceae	Unknown	*Euphorbia hyssopifolia*	✓
Asteraceae	Rong Bush	*Wedelia bahamense*	✓
Fabaceae	Caribbean Stylo	*Stylosanthes hanata*	✓
Poaceae	Drop Seed Grass	*Sporobolus domingensis*	✓

3.2.1.3.3.1 Fauna

Terrestrial ecosystems support a variety of other fauna. These species depend on and aid in the overall health of the ecosystem. The proposed project site contains reptiles, molluscs (gastropoda), and a myriad of arthropods (arachnids, insects, and hymenopterans).

Table 3: Fauna Species List

Family	Common Name	Scientific Name
Pieridae	Lyside Sulphur	*Kricogonia lyside*
Apidae	Honeybee	*Apis mellifera*
Vespidae	Wasp	*Polistes major*

3.2.1.3.3.2 Invasive Species Survey

A total of four (4) invasive species were observed on The Project site. The occurrence, abundance, and suggested control measures for these species are listed below (See Table 4). It is advised to control species whose distribution and richness are too extensive to eradicate,

but whose spread can be inhibited by a variety of mitigation strategies. On the other hand, species that can be eradicated are those whose distribution and richness are relatively small.

Table 4: Invasive Species Summary and Recommendations

Species	Occurrence and Abundance	Recommendations
Jasmin Vine *(Jasminum fluminense)*	Vines in fruit were observed growing along the fence and vegetation within the HAE on The Project site.	Control
Monkey Tamarind *(Mucuna puriens)*	Vines observed growing along the fence within the HAE on The Project site.	Eradication
Jumbay *(Leucaena leucocephala)*	Two to three feet (2 ft. -3 ft.) tall seedlings observed growing around the perimeter of The Project site.	Control
Morning Glory (*Ipomoea indica*)	Vines observed growing along the fence within the HAE on The Project site.	Control

*Recommendations as per the National Invasive Species Strategy for The Bahamas, 2013.

Photo 9: Monkey Tamarind *(Mucuna puriens)*

3.2.1.3.3.3 Protected Species Survey

The Forestry Act Declaration of Protected Trees Order 2021 lists one hundred and twenty-seven (127) vascular plant species as protected, and eighty-six (86) species are listed as Endemic, Endangered, or Threatened. Endemic species are native and restricted to the archipelago, island groupings, or specific islands. Additionally, forty-one (41) are listed as

Cultural, Historical, or Economic. Cultural or historical species are species of historical or cultural importance, such as those utilized for boat building and straw work. One (1) species listed on the Forestry Act Declaration of Protected Trees Order 2021 was recorded at the site (See Table 5).

Endemic, Endangered, or Threatened Protected Trees

Rong Bush (*Wedelia bahamensis*) is the only protected species observed on site that is listed under the subsection of Endemic or Endangered, or Threatened Protected Trees (Schedule 1) in the Act.

Table 5: Protected species observed on The Project site.

#	Species Recorded		Location
	Common Name	Botanical Name	
1	Rong Bush	*Wedelia bahamensis*	Seven inches (7 in) herbaceous plants in flower observed growing within the HAE on The Project site.

Photo 10: Rong Bush (*Wedelia bahamensis*)

Cultural, Historical, and Economic Protected Trees

There were no species observed on site listed under the subsection of Cultural, Historical, and Economic Protected Trees in the Act.

Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

CITES is a transnational treaty to conserve and protect endangered flora and fauna from the threats of international trade. CITIES have three (3) Appendices (I, II, III) that contain lists of species that are provided with distinct types of protection from overexploitation. There were no species observed on site listed on the CITES red list.

3.2.2 Avian Survey

An avian survey was conducted to identify the presence, abundance, and habitat utilization of avian species within the site boundaries.

3.2.2.1 Methodology

The assessment comprised of one (1) hour and twenty (20) minutes of active avian and ecological observations. Field studies consist of a fall avian survey conducted on September 1st, 2025, between 11:00 am and 12:20 pm. The avifauna of the area was assessed and recorded by walking along the perimeter of the site and within the interior of the site by utilizing established footpaths and roadways. Avifauna and fauna taxonomy is based on Currie et al (2019). Species numbers were recorded in the abundance categories: Single (1), Few (2-10), and Many (11-100). Species recorded were compiled for final abundance estimates. Status is based on the International Union for Conservation of Nature (IUCN).

3.2.2.2 Findings

3.2.2.2.1 Avian Species Diversity

Two (2) species were recorded during the avian survey (See Table 6).

Table 6: Avifauna observed

Table 6 Key:

Range	Status	Observations
PRB = Permanent Resident Breeding	LC = Least Concern (Conservation-IUCN)	Single = 1 individual
SRB = Summer Resident Breeding	NT = Near Threatened (Conservation-IUCN)	Few = 2-10 individuals
E =Endemic Species	IUCN = International Union of Conservation of Nature	Many = 11-100 individuals
UWR = Uncommon Winter Resident		

Family	Common Name	Scientific Name	Master Observation	Range/Conservation Status
Columbidae	Common Ground Dove	*Columbina passerina bahamensis*	Few	PRB/E/LC
Larinae	Laughing Gull	*Leucophaeus atricilla*	Few	PRB/LC

3.2.2.2.2 Range

A species' range can be defined as an area in which a particular species can be found. Migratory birds tend to have seasonal ranges, while species with restricted ranges spend their entire life on the same island or in the same geographical region.

3.2.2.2.2.1 Permanent Resident Breeding

Permanent Resident breeding (PRB) species refers to the resident species that live and breed year-round throughout the Bahama Islands. All avian species observed on site are PRB species.

3.2.2.2.2.2 Endemic Species and Subspecies

Endemic species and subspecies are birds that exist only in The Bahamas. There was one (1) endemic subspecies, Common Ground Dove (*Columbina passerine bahmensis*), observed on The Project site.

3.2.3 Marine Survey

On September 5th, 2025, field studies were conducted to assess the coastal environment of Arawak Cay. A four (4) person team consisting of JSS Consulting team members and one (1) boat captain conducted the assessment. The survey was conducted to record the existing conditions of the site and the diversity of benthic flora and fauna within the direct and indirect footprint of works. Scope of works includes:

- Assessment of the benthic composition of the coastal ecosystem.
- Assessment of the ecosystem's health, inclusive of corals for Bleaching, Stony Coral Tissue Loss Disease (SCTLD), and other diseases.
- Conducting a marine Survey of the flora and fauna abundance within the ecosystems.

3.2.3.1 Methodology

The survey area was assessed using the roving diver method (RDM). Divers assessed the benthic composition of the area using a Chasing F1 Surface Pro Drone and took representative and notable conditions. One (1) parallel roving transect to the shoreline was done in the area (See Figure 11). The roving transect was approximately one thousand forty-

two feet (1,042 ft.) from the shoreline and approximately four thousand feet (4,000 ft.) in length.

The Chasing F1 Surface Pro Drone was also used to complete spot checks along the transmission cable route (See Figure 12). Sixteen (16) spot checks were completed to note changes in benthic habitat and provide a general description of the area. GPS Coordinates (See Appendix F) were taken for each spot check using a Garmin Montana 680t.

Habitat Characterization and Mapping

Benthic habitats were identified by the substrate type (e.g., sand, hard bottom, macroalgae, seagrass bed, etc.). Important areas, along with any ecologically and commercially important species utilizing the areas, were noted, and representative photos were taken. Habitat types identified and recorded by divers were used along with satellite imagery to create a GIS benthic habitat map.

Species Diversity

Coral health was visually observed during the assessment for the presence of diseases such as Stony Coral Tissue Loss Disease (SCTLD) and coral bleaching. Representation photos were taken.

A record was taken of all flora and fauna species, and a species list was created. Biota was classified into genus and species using Humann et al, 2013, Reef Coral Identification, Humann et al., 2013, Reef Fish Identification, and Humann et al., 2013, Reef Creature Identification. Algae were identified to genus and species if possible, or to the functional group (e.g., turf algae, fleshy macroalgae, etc.). Data will be presented in a table with the species' scientific and common names and abundance. Species abundance was recorded as Single (1), Few (2-10), Many (11 -100), and Abundant (100+).

Figure 11: Transect Map

Figure 12: Spot Check Map

Water Quality Analysis

Surface water quality sampling was conducted to document baseline water quality conditions in The Project area. The following parameters were analyzed using the Horiba U-50 Multipara meter Water Quality Meter:

- Salinity
- Turbidity
- Temperature
- pH
- Dissolved oxygen
- Total dissolved solids

3.2.3.2 Depth Measurement

Depth measurements were taken using the depth finder on the Chasing F1 Surface Pro Drone. Depths were taken at the same location, spot checks and water quality readings were conducted (See Table 7).

3.2.3.3 Results

3.2.3.3.1 General Observation

The assessment started at approximately 11:34 am and concluded at approximately 12:53 pm. The weather conditions during this assessment were cloudy with nine miles per hour (9 mph) winds out of the southwest. Low tide was observed, and the water temperature was on average 30°C.

The surveyed site encompasses shallow water between three feet (3 ft.) and forty-five point five feet (45.5 ft.). Based on a range of one to ten (1-10), with one (1) being zero visibility and ten (10) being transparent, visibility was six (6) within the assessed areas.

3.2.3.3.2 Water Quality Analysis

Water quality samples were taken in the surveyed areas during the assessment. A total of sixteen (16) samples were taken and recorded (See Table 7). All readings were within normal range for a coastal environment.

Table 7: Arawak Cay Project Water Quality Analysis Results

Arawak Cay Project Water Quality Analysis										
Water Sample	**Latitude**	**Longitude**	**Time (am)**	**Depth (ft.)**	**Temperature(°C)**	**pH**	**Salinity (ppt)**	**Turbidity (NTU)**	**Dissolved Oxygen (mg/l)**	**Total Dissolved Solids (g/L)**
1	25°4'56.41"N	77°21'18.34"W	11:34	3.5	30.21	7.80	36.29	0.0	10.90	32.9
2	25°4'56.23"N	77°21'17.64"W	11:58	9	30.20	9.40	36.42	0.0	8.95	33.0
3	25°4'55.59"N	77°21'15.29"W	12:04	11	30.15	9.46	35.87	0.0	8.31	32.5
4	25°4'54.85"N	77°21'12.53"W	12:08	12	30.10	9.47	36.34	0.0	8.34	32.9
5	25°4'54.12"N	77°21'9.86"W	12:12	10.05	30.10	9.42	35.82	0.0	8.19	32.5
6	25°4'53.37"N	77°21'7.08"W	12:15	11.5	30.10	9.51	36.37	0.0	8.13	32.9
7	25°4'52.65"N	77°21'4.43"W	12:18	45.5	30.13	9.59	36.40	0.0	8.32	33.0
8	25°4'51.90"N	77°21'1.63"W	12:24	16	30.08	9.70	36.35	0.0	8.27	32.9
9	25°4'51.17"N	77°20'58.90"W	12:27	12.5	30.07	9.66	35.46	0.0	8.26	32.2
10	25°4'50.44"N	77°20'56.20"W	12:30	11.5	30.16	9.39	35.78	0.0	8.22	32.5
11	25°4'49.72"N	77°20'53.53"W	12:33	10	30.23	9.35	34.91	0.0	8.39	31.8
12	25°4'48.98"N	77°20'50.83"W	12:39	11	30.16	9.55	36.10	0.0	8.35	32.7
13	25°4'48.24"N	77°20'48.08"W	12:42	9	30.08	9.55	35.77	0.0	8.27	32.4
14	25°4'47.50"N	77°20'45.37"W	12:45	9	30.37	9.70	35.80	0.0	8.62	32.5
15	25°4'46.93"N	77°20'43.25"W	12:50	8	30.25	9.54	35.06	0.0	9.86	31.9
16	25°4'46.56"N	77°20'41.90"W	12:53	8.6	30.23	9.54	35.62	0.0	8.24	32.3

Figure 13: Water Quality Analysis Map

3.2.3.3.3 Benthic Description

The following section provides descriptions of the benthic habitat observed on The Project site. Due to the similarity in benthic habitat along the transect and spot checks, the habitats encountered are separated into three (3) generalized categories and five (5) variations:

- Sandy Bottom
    - Sandy Bottom with Macroalgae
    - Sandy Bottom with Seagrass
    - Silt with Macroalgae
- Hard Bottom
    - Hard Bottom with Macroalgae
    - Hard Bottom with Seagrass
- Seagrass Bed

3.2.3.3.3.1 Sandy Bottom

Sandy bottom habitats include sandy bottom with macroalgae, sandy bottom with seagrass, and silt with macroalgae.

3.2.3.3.3.1.1 Sandy Bottom with Macroalgae

Sandy bottom with macroalgae was observed extending from the hard bottom with macroalgae habitat on the western and eastern sections of the cable route. Dominant algae observed included Three Finger Leaf Algae (*Halimeda incrassata*), Flat-top Bristle Brush (*Penicillus pyriformis*) and Bristle Ball Brush (*Penicillus dumetosus*), Pinecone Algae (*Rhipocephalus phoenix*), and Laurencia (*Laurencia sp.*).

Fauna abundance and diversity were low in this area.

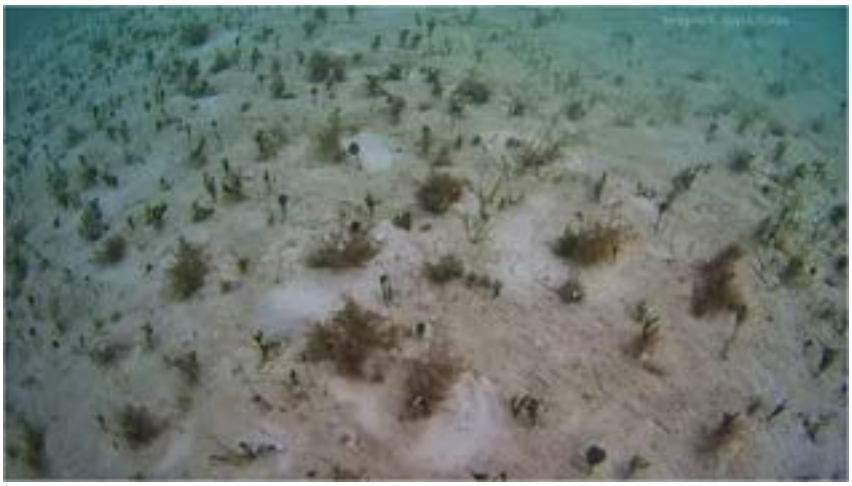


Photo 11: Sandy Bottom with Macroalgae (*Sargassum fluitans)*

3.2.3.3.3.1.2 Sandy Bottom with Seagrass

Sandy bottom with seagrass was observed at the center and eastern region of the cable route. Turtle Grass (*Thalassia testudinum*) was the most dominant species observed in low to moderate density. Turtle Grass (*Thalassia testudinum*) was observed intermixed with Manatee Grass (*Syringodium filiforme*) and macroalgae such as Bristle Ball Brush (*Penicillus dumetosus*) and Pinecone Algae (*Rhipocephalus phoenix*), in varying amounts.

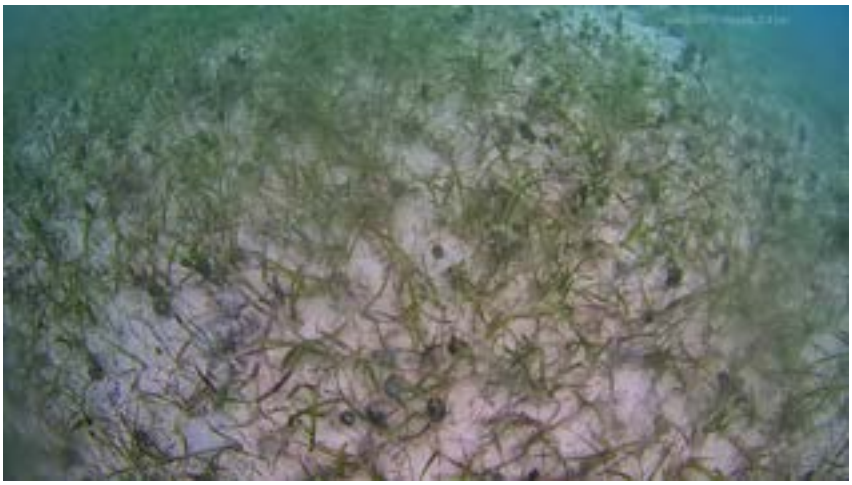


Photo 12: Sandy Bottom with Seagrass

3.2.3.3.3.1.3 Silt with Macroalgae

Silt with macroalgae was observed in the center of the cable route. Dominant macroalgae observed include Three Finger Leaf Algae (*Halimeda incrassata*), Bristle Ball Brush (*Penicillus dumetosus*), and Pinecone Algae (*Rhipocephalus phoenix*). Macroalgae were observed to cover areas in sparse to moderate density throughout this benthic habitat.

Fauna abundance and diversity were low in this area. Fish species observed included Blue Tang (*Acanthurus coeruleus*) and Banded Butterflyfish (*Chaetodon striatus*). Additionally, Queen Conch (*Aliger gigas*) was the predominant epifauna species observed.

Photo 13: Silt Sandy Bottom with Macroalgae

3.2.3.3.3.2 Hard Bottom

Hard bottom areas consisted of hard bottom with macroalgae and hard bottom with seagrass habitats.

Photo 14: Hard Bottom

3.2.3.3.3.2.1 Hard Bottom with Macroalgae

Hard bottom with macroalgae habitats was observed at the start (western end) of the cable route extending from the hard bottom with seagrass habitat. Macroalgae were observed in sparse density. Dominant macroalgae included Bristle Ball Brush Algae (*Penicillus dumetosus*) and Pinecone Algae (*Rhipocephalus phoenix*). Fauna diversity and abundance were observed to be low in this habitat.

Photo 15: Hard Bottom with Macroalgae.

3.2.3.3.3.2.2 Hard Bottom with Seagrass

Hard Bottom with Seagrass was observed at both ends of the cable route. This area had low rugosity, and loose rubble was observed in pockets of the hard bottom. Seagrass was observed in sparse density, with the dominant seagrass observed being Turtle Grass (*Thalassia testudinum*). Coral species observed included the Mustard Hill Coral (*Porites asteroides*).

Fauna diversity and abundance were low in this area. The predominant epifauna observed included Black Ball Sponge (*Ircinia strobilina*), Branchlet Sponge (*Aplysina insularis*).

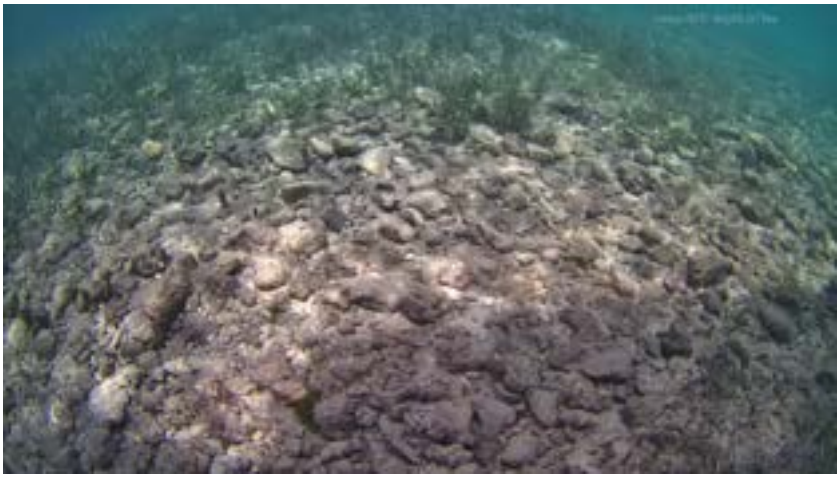


Photo 16: Hard Bottom with Turtle Grass (*Thalassia testudinum*)

3.2.3.3.3.3 Seagrass Bed

Seagrass beds were observed in patches extending from the sandy bottom with macroalgae, further to the east of the cable route. Turtle Grass (*Thalassia testudinum*) was the most dominant species. The density of the seagrass beds ranged from twenty to ninety percent (20% -90%) cover.

Fauna diversity and abundance were low in this area. Fish observed included: Houndfish (*Tylosurus crocodilus*) and Beaugregory (*Stegastes leucostictus*). The was also one (1) Green Turtle (*Chelonia mydas*) observed in this habitat.

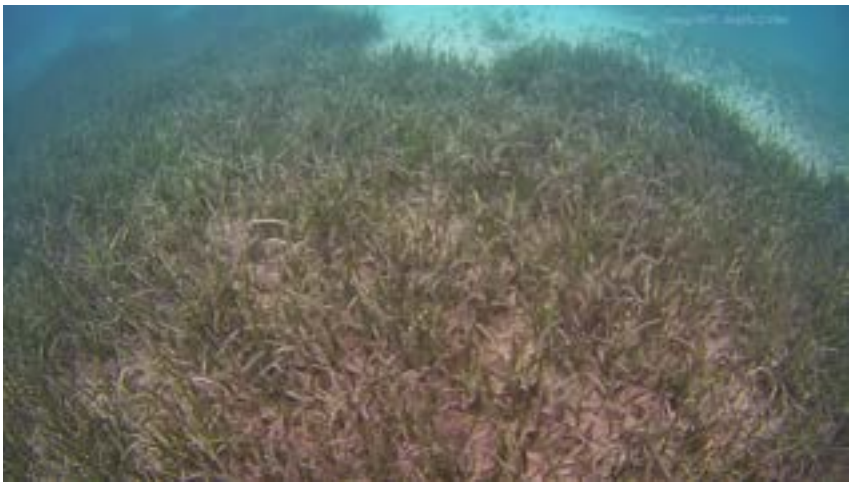


Photo 17: Seagrass Bed

3.2.3.3.4 Benthic Habitat Map

Figure 14: Benthic Habitat Map

3.2.3.3.5 Species List

Roving diver visual fish surveys were conducted to form the species list. Fish, coral, and other fauna and epifauna observed were identified and given a frequency rating (based on occurrence) of Single (1 individual), Few (2-10 individuals), Many (11-100 individuals), or Abundant (more than 100 individuals).

3.2.3.3.5.1 Fauna

3.2.3.3.5.1.1 Fish Species

Fish species were observed throughout the entire surveyed area, but were mainly observed in crevices of the hard bottom habitat. There were six (6) fish species observed during the assessment.

Table 8: Fish species observed during the assessment

Common Name	Scientific name	Abundance
Houndfish	*Tylosurus crocodilus*	Single
Banded Butterflyfish	*Chaetodon striatus*	Few
Blue Tang	*Acanthurus coeruleus*	Few
Silversides*	*Atherinidae, Clupeidae, Engraulididae Family**	Many
Beaugregory	*Stegastes leucostictus*	Few
Bluehead Wrasse	*Thalassoma bifasciatum*	Few

Photo 18: Blue Tang (*Acanthurus coeruleus*).

3.2.3.3.5.1.2 Coral Species

The majority of the coral species were observed in the hard bottom habitats. There was (1) coral species observed during the assessment.

Table 9: Coral species observed during the assessment

Common Name	Scientific name	Abundance
Mustard Hill Coral	*Porites astreoides*	Abundant

3.2.3.3.5.1.3 Other Fauna and Epifauna

One (1) other fauna species and five (5) epifauna species were observed during the assessment. The fauna species observed was a green turtle (*Chelonia mydas*), and the epifauna included Queen Conch (*Aliger gigas*), Black Ball Sponge (*Ircinia strobilina*), Branchlet Sponge (*Aplysina insularis*), and Southern Lungworm (*Arenicola cristata*). The majority of the non-coral invertebrate species were observed on the sea floor.

Table 10: Other Fauna and Epifauna observed during the assessment

Common Name	Scientific name	Abundance
Green Turtle	*Chelonia mydas*	Single
Queen Conch	*Aliger gigas*	Few
Black Ball Sponge	*Ircinia strobilina*	Few
Southern Lugworm	*Arenicola cristata*	Many
Branchlet Sponge	*Aplysina insularis*	Few

Photo 19: Queen Conch (*Aliger gigas)*

3.2.3.3.5.2 Flora Species

Flora Species were observed in abundance throughout The Project footprint. There were eight (8) flora species observed across the site.

Table 11: Flora species observed during the assessment

Common Name	Scientific name
Bristle Ball Brush	*Penicillus dumetosus*
Flat-Top Bristle Brush	*Penicillus pyriformis*
Pinecone Algae	*Rhipocephalus phoenix*
Macroalgae sp.	*Udotea sp.*
Three-Finger Leaf Algae	*Halimeda incrassata*
Laurencia	*Laurencia sp.*
Manatee Grass	*Syringodium filiforme*
Turtle Grass	*Thalassia testudinum*

Photo 20: Three Finger Leaf Algae (*Halimeda incrassata*), Bristle Ball Brush (*Penicillus dumetosus*), and Pinecone Algae (*Rhipocephalus phoenix*)

3.2.3.3.6 Commercially Important, Endangered, and Protected Species

There were six (6) marine species observed during this assessment that are listed on the Convention on International Trade of Endangered Species (CITES) list and/or the International Union for Conservation of Nature (IUCN) Red List (See Table 12). The CITES listing group species are in Appendices I, II, and III. There were no species observed during the assessment that are listed on the CITES list.

The IUCN Red List Categories and Criteria classify species at high risk of global extinction. It divides species into nine (9) categories: Not Evaluated, Data Deficient, Least Concern, Near Threatened, Vulnerable, Endangered, Critically Endangered, Extinct in the Wild, and Extinct.

Table 12: ICUN and CITES status for species observed

Common Name	Scientific Name	CITES Listing	IUCN Listing
Mustard Hill Coral	*Porites astreoides*	Appendix II	Least Concern
Green Turtle	*Chelonia mydas*	Appendix I	Endangered
Banded Butterflyfish	*Chaetodon striatus*	N/A	Least Concern
Beaugregory	*Stegastes leucostictus*	N/A	Least Concern
Blue Tang	*Acanthurus coeruleus*	N/A	Least Concern
Bluehead Wrasse	*Thalassoma bifasciatum*	N/A	Least Concern

There are some species of fauna and flora observed during the assessment that are important to the economy of The Bahamas and are important key stone species for the marine ecosystems. Other species are protected under The Bahamas Fisheries Resources (Jurisdiction and Conservation) Act 1977 (highlighting amendments 2006, 2010, 2011) and the Fisheries Act 2020.

Stony Corals, such as Smooth Flower Coral (*Eusmilia fastigiata*), help to build reef systems that become important habitats for a large variety of marine biodiversity. All Stony Coral species are listed in CITES Appendix II and are protected under the Fisheries Resources (Jurisdiction and Conservation) Regulations. Green Turtles (*Chelonia mydas*) are listed in CITES Appendix I and are protected under the Fisheries Resources (Jurisdiction and Conservation) Regulations. Additionally, Manatee Grass (*Syringodium filiforme*) and Turtle Grass (*Thalassia testudinum*) are protected under the Declaration of Protected Trees Order, 2021.

Commercially important refers to species that are sold for economic gain. Endangered species refer to species that are at high risk of extinction. Protected species refer to species safeguarded by laws. Ecologically important species refer to species that perform crucial roles in maintaining a healthy ecosystem. Regulated Species refer to species whose trade, movement, or use is governed by laws, regulations, or international conventions. Table 13 below outlines these key species.

Table 13: Commercially important, endangered, and protected species of The Bahamas

Table key: **CI** = Commercially Important, **ES** = Endangered Species, **PS** = Protected Species, **EI** = Ecologically Important, **RS** = Regulated Species

Common Name	Scientific Name	Status
All Coral Species	*Scleratinia spp.*	PS/EI
Green Turtle	*Chelonia mydas*	ES/PS
Turtle Grass	*Thalassia testudinum*	PS

Manatee Grass	*Syringodium filiforme*	PS

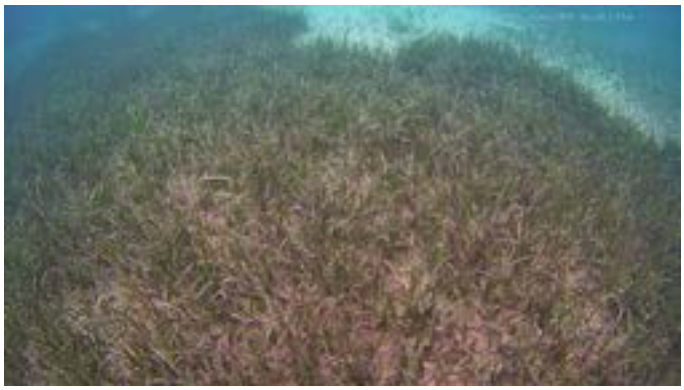


Photo 21: Turtle Grass (*Thalassia testudinum*)

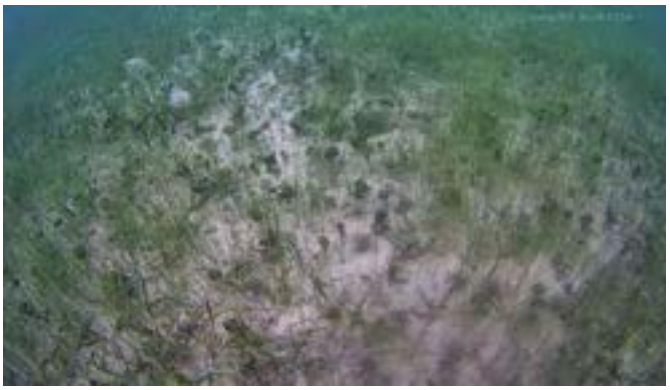


Photo 22: Turtle Grass (*Thalassia testudinum*) intermixed with Manatee Grass (*Syringodium filiforme*) and Macroalgae (*Macroalgae sp.*)

3.2.3.4 Discussion

The assessed area consisted of a coastal marine ecosystem. The Project work includes the construction of a Combined Cycle Power Plant on Arawak Cay and a cable that leads from the power plant to Nassau Cruise Port.

The descriptions of benthic habitat observed are a fair representation of the vegetation cover and biodiversity on the site, as the site was most recently dredged approximately three (3) years ago. The benthic habitats appear to be healthy and consist of typical flora and fauna populations for the area. There was also no evidence of degraded water quality.

While it is likely that additional species would be recorded with further field studies this is not likely to impact the results of this study for the purposes it is intended.

Benthic Composition

The benthic composition of the assessed area consisted of hard bottom habitats (hard bottom with macroalgae and hard bottom with seagrass), that extended from the coastline and transitions to sandy bottom habitats (sandy bottom with macroalgae, sandy bottom with seagrass and silt with macroalgae) to the center of the assessed area. Seagrass habitats was observed further east and extended from the sandy bottom habitats.

Fish Diversity

Fish diversity and abundance was considered to be low for the site. Majority of fish species were observed to be transitioning from one habitat to the next. This is to be expected as there were limited crevices in the habitats to provide shelter for the species.

Seagrass

Seagrass was observed on the western and eastern sides of the assessed area. Seagrass density was often observed to be moderate to dense. Turtle grass (*Thalassia testudinum*) was the dominant seagrass species observed. Seagrass species were observed to be monotypic in some areas, with Turtle Grass (*Thalassia testudinum)* being observed with no Manatee Grass (*Syringodium filiforme*). Turtle grass (*Thalassia testudinum*) and Manatee Grass (*Syringodium filiforme*) are now listed on the updated 2021 Bahamas Protected Tree Order.

Efforts will be made to avoid the seagrass beds where possible.

Overall, these findings were expected for the assessed ecosystem. The impact that The Project will incur is considered to be low risk to the surrounding environment. It is suggested that all environmental best practices be implemented throughout the development of The Project.

3.2.4 National Parks

The Arawak Cay LNG Project is not located within any National Park or declared Marine Protected Area; however, it lies approximately three point four miles (3.4 mi) from the Southwest New Providence Marine Managed Area (SWNPMMA). The eighteen thousand two hundred and twenty-two point five-acre (18,222.5 ac) site is proposed to regulate human activity and protect diverse marine ecosystems, though not designated to a specific agency. While there are no National Parks or Protected Areas directly on or surrounding Arawak Cay, the island of New Providence contains four parks managed by The Bahamas National Trust: Bonefish National Park, Harold and Wilson Ponds, Primeval Forest National Park, and The Retreat Gardens, in addition to the Southwest Marine Park.

Figure 15: Map of the nearest National Park to The Project Site

3.3 Socio-economic Aspects

Sustainable energy solutions, including renewable energy, are sometimes perceived as involving significant trade-offs, particularly in terms of socio-economic development. This perception often arises from concerns over potential disruptions to traditional industries, the upfront cost of new technologies, and the challenges of transitioning away from well-established energy systems. Such concerns may lead to resistance from stakeholders who fear negative impact on employment, costs, and economic stability. However, this view overlooks the long-term socio-economic advantages of sustainable energy.

As governments around the world work to implement the 2015 Paris Climate Agreement, they face the complex task of balancing the urgency of the energy transition with broader socio-economic goals. The shift towards sustainable energy sometimes requires careful planning to ensure social and economic disruptions are minimized, particularly for vulnerable communities. Governments must consider a range of factors, including the impact of energy costs on low-income households, the need for new infrastructure investments, and the provision of equitable access to clean energy.

Fortunately, renewable energy solutions not only address climate change but also bring a wide range of socioeconomic benefits, including:

- Security and diversification of energy supply,
- Increase self-reliance,
- Job creation in emerging green sectors,
- New income sources and economic opportunities,
- Income diversification for households and communities,
- Benefits for rural and remote areas, stimulating local economies,
- Improvement of local skills and education, fostering human capital development,
- Better Public health through cleaner air and reduced environmental impacts,
- Enhanced social cohesion and stability, as communities become more resilient to energy price fluctuations.

The Bahamas is currently reliant on imported diesel and gas, with a high electricity cost of US$0.28 per kWh, above the Caribbean average of US$0.24 per kWh. These elevated costs erode disposable income, with rising oil prices directly impacting inflation through higher transportation costs. Moreover, the country's low efficiency and limited adoption of renewable technologies make it increasingly vulnerable to global energy price shocks, reducing its overall competitiveness in the global market.

In 2024, The Bahamian government announced plans to reduce its dependence on heavy oil and gas imports by transitioning to LNG. BPL will play a central role in integrating LNG into the National Energy Production System, leading to rate adjustments aimed at benefiting low-income households. This shift towards LNG is expected to enhance energy affordability and

sustainability for the Bahamian population, contributing to broader socioeconomic development goals.

3.3.1 Demographics

As of July 1st, 2024, the population of The Bahamas is estimated at four hundred one thousand nine hundred and ninety-eight (401,283). According to the latest projections by the United Nations (UN). More recent estimates place the total population at approximately 401,998. Of this number, the island of New Providence, which includes the capital city Nassau, accounts for the majority, with a reported population of two hundred ninety-six thousand seven hundred thirty-two (296,732).

While there are no permanent residents on Arawak Cay, the area plays a significant role in the daily socioeconomic activity of New Providence. It is located adjacent to the Downton area and serves as a major transportation and commercial hub, home to numerous businesses, government offices, schools, and both local and tourist attractions. As such, any developments or environmental changes in the Arawak Cay area may indirectly impact a significant portion of the surrounding population through traffic, employment, public services, and tourism-related activities.

3.3.2 Utilities and Services

3.3.2.1 Electricity

The electrical power for the site will be provided by BPL. Detailed construction plans accompanying the electrical distribution system will be prepared before the commencement of construction activities.

3.3.2.2 Water Supply

The Bahamas Water and Sewerage Corporation (WSC) is a government organization under the jurisdiction of the Ministry of Works. The Corporation is entrusted with managing, maintaining, distributing, and developing the water resources of The Bahamas. Process water for infrastructure, such as office buildings, will be connected to the WSC network. Sewage for the Site will be disposed of via WSC municipal lines.

In addition to existing utility connections, The Project also intends to implement a seawater reverse osmosis (SWRO) system to supply fresh water for both the plant operations and office facilities. The SWRO system will produce two thousand cubic meters (2000 m^3) of water per day. This system will enhance The Project's water sufficiency and reduce dependence on the municipal water supply. The integration of SWRO technology reflects The Project's commitment to sustainable resource management, particularly given the sensitivity of freshwater resources in island environments.

All potable water supply and sewerage disposal will be managed by the Corporation.

3.3.3 Ship Transportation

Vessel transportation will be impacted due to the installation of the cable from the Nassau Cruise Port to The Project site. During construction activities, commercial shipping, commercial and recreational fishing, and boating, all of which occur around The Project site, will be temporarily delayed or redirected. The Port Department will be notified at the commencement of cable installation to coordinate navigational advisors and traffic management plans.

Disruptions to maritime transportation may result in delays in cargo delivery, affecting local businesses that rely on timely shipments of goods and supplies. Fishermen and tour operators may also face temporary losses in income due to restricted access to traditional fishing grounds or tourism routes. These impacts could disproportionately affect small-scale operators and independent livelihoods, which are often more vulnerable to even short-term disruptions.

In addition, construction-related marine traffic could contribute to increased congestion in the harbor area, posing navigational risk and increasing operational costs for vessel operators. There may also be public concern or dissatisfaction if construction causes significant delays or restricts access to popular marine or coastal recreational areas.

3.3.4 Tourist and Recreational Areas

Located in proximity to Arawak Cay is the "Fish Fry," a popular community of Bahamian restaurants renowned for their seafood delicacies and vibrant cultural atmosphere. Along the coast, within the designated cable route, there are several tourist and recreational areas, such as Junkanoo Beach and Long Wharf Beach. Additionally, the cruise port serves as a major hub for tourists, offering a range of recreational facilities and visitor attractions.

Once construction commences, certain tourist and recreational areas may become temporarily inaccessible to ensure the safety of the general public. Access restrictions, noise, and visual disturbances may impact the overall visitor experience, especially in high traffic zones.

During the operational phase, noise levels are expected to exceed 60 dB (decibels). Elevated noise generated by the operation of the LNG plant may affect the comfort and appeal of surrounding recreational areas. As a result, visitors and nearby residents may be deterred from frequenting these locations, potentially leading to a decline in foot traffic and a corresponding impact on local businesses that rely on tourism and leisure activities.

3.3.5 Aesthetics and Visual Quality

While managing public opinion through aesthetic design features is important, it does not override other valid public concerns, such as the selection of the site or the significant construction costs associated with the proposed LNG facility. The current land use at Arawak Cay is primarily industrial, and its proximity to the newly constructed Nassau Cruise Port enhances its strategic appeal, making it the preferred location for The Project from a logistical and operational standpoint.

One of the key factors influencing the visual impact of the proposed facility is its visibility from various vantage points, which will be affected by viewing distance, elevation, and line of sight obstructions. Given the high visibility of Arawak Cay from key public tourist areas, such as the cruise port and Junkanoo Beach, visual impacts must be carefully considered in the facility's design.

4.0 Legal Aspects

All development projects are carried out within a framework of national regulations, international conventions, corporate policies, procedures, and recognized third-party guidelines, all of which have different applications, remits, requirements, and implications.

4.1 Domestic Legislation

The Developer will comply with the legal requirements of the Government of the Bahamas, topic-specific conventions to which The Bahamas is a signatory, and The Developer's own internal standards. The Developer will also consider, when relevant, the establishment of mitigation measures and the application of applicable international standards, including the International Finance Corporation (IFC) guidelines and the World Bank's Environmental, Health, and Safety (EHS) Guidelines.

Twenty (20) legislations are relevant and applicable to the management of the physical and natural environment of the proposed Project as outlined in Table 14.

Table 14: A Summary of National Laws and Regulations

Act Title	**Year Enacted**	**Comments**
Bahamas National Maritime Policy	2015	This Policy was established in 2015 and updated in 2017 to ensure the sustainable development of the Maritime sector, protection of the marine environment, and to utilize the valuable resources efficiently and effectively within The Bahamas.
National Invasive Species Strategy	2013	The goal of the strategy is the protection of the environment, genetic diversity of flora and fauna, and ecosystem services of The Bahamas, through the prevention of introduction, as well as management and eradication, of invasive species.
Forestry Act	2010	Provides a regulatory framework for the management of forest lands and protected

Act Title	Year Enacted	Comments
		species of trees and other plants which are either threatened, endangered, or endemic to The Bahamas.
Environmental Health Act	1987	Provides the framework for environmental regulations that will ensure compliance for The Project. The Act authorized the Department of Health Services (DEHS) to develop regulations that prevent and control air pollution, soil contamination, and preserve water quality.
Wild Animals Protection Act	1968	Prohibits the taking, capturing, or hunting of any animal without a permit.
Wild Birds Protection Act	1952	Prohibits the taking, capturing, or hunting of any animal without a permit. Protects birds and eggs during closed season.
Marine Mammal Protection Act	2005	This Act sets forth provisions to protect marine mammals, including prohibiting the import of marine mammals and barring illegal taking, harassing, and otherwise harming marine mammals, among other guidelines.
Conservation and Protection of the Physical Landscape of The Bahamas Act	1997	Protects the physical landscape from environmental degradation, flooding, and removal of hills; regulates filling of wetlands, drainage basins, or ponds; prohibits digging or removing sand from beaches and sand dunes; prevents harvesting or removing protected trees. In order to perform activities that may affect the physical landscape of The Bahamas, permits must be obtained for these activities. The Department of Physical Planning issues the permits and enforces the regulations.
Coast Protection Act	1968	This Act makes provision for the protection of the coast against erosion and encroachment

Act Title	Year Enacted	Comments
		by the sea and for purposes connected therewith.
Port Authorities Act	2006	This Act sets forth provisions appointing port authorities to all ports and harbors of The Bahamas to better regulate and control port operations.
The Environmental Planning and Protection Act	2019	The Act provides for the prevention or control of pollution, the regulation of activities, and the administration, conservation, and sustainable use of the environment, and for connected purposes.
The Environmental Protection (control of plastic pollution) Act	2019	This Act prohibits single-use plastic foodware and non-biodegradable and biodegradable single-use plastic bags; prohibits the release of balloons; regulates the use of compostable single-use plastic bags, and provides for connected matters.
The Ministry of the Environment Act	2019	This Act establishes the Ministry of the Environment to oversee the integrity of the environment of The Bahamas, to make the minister responsible therefore a corporation sole, to establish the environmental administration fund and the environmental trust fund, and for matters connected thereto.
Health and Safety at Work Act	2002	This Act makes provisions relating to health and safety at work and for connected purposes. It details the general duties of employers and employees at work.
Environmental Impact Assessment Regulations	2020	To provide procedures for a Certificate of Environmental Clearance (CEC). The Regulations provide procedures for the review of proposed projects, inclusive of monitoring and compliance requirements. The Regulations dictate the requirements for a

Act Title	Year Enacted	Comments
		Certificate of Environmental Compliance (CEC).
Natural Gas Act	2024	Regulates the import, storage, transport, and retail of natural gas, establishes licensing for facilities and terminals, and sets safety standards. The Utilities Regulation and Competition Authority (URCA) oversees compliance, issues licenses, monitors activities, and protects consumer interests to ensure efficient, safe, and sustainable operation of the natural gas industry in The Bahamas.
The Merchant Shipping (Oil Pollution) Act	1976	The Act provides for the proper registration of ships, the control, regulation, and orderly development of merchant shipping in The Bahamas, the proper qualification of seamen, and the regulation of employment conditions for seamen. These provisions advocate ship safety and competency, which prevent shipping accidents that can be detrimental to the marine environment as well as human casualties.
Disaster Preparedness Response Act	2006	This Act provides for a more effective organization of the mitigation of, preparedness for, response to, and recovery from emergencies and disasters.
Fisheries Resources (Jurisdiction and Conservation) Act and Regulations	1977	This Act regulated the conservation and management of fishery resources and allows for the extension of jurisdictional limits of those resources. The accompanying regulations define the use, possession, sale, and other activities associated with various fisheries, including hard and soft corals, as

Act Title	Year Enacted	Comments
		well as the means to acquire permits to harvest or sell certain marine fauna.
Planning and Subdivision Act	2010	This Act provides for: A land use planning-based development control system led by policy, land use designations and zoning. Prevention of indiscriminate division and development of land. Promotion of sustainable development in a healthy natural environment. Maintenance and improvement of the quality of the physical and natural environment. Protection and conservation of the natural and cultural heritage of The Bahamas. Planning for the development and maintenance of safe and viable communities.

4.2 International Legislation

There are twenty-four (24) international protocols and conventions that The Bahamas is a part of, as outlined in Table 15.

Table 15: International Legislation Applicable to The Project.

Convention/Protocol	Entry in Force/ Accession	Objectives
Convention on Wetlands of International Importance (Ramsar Convention), 1971	June 1997 (entry in force)	The Convention aims to maintain the ecological characteristics of wetlands of international importance and to plan the "wise use", or sustainable use, of all wetlands on the territory of the countries which have ratified the Convention. It aims to protect wetlands to stem the progressive encroachment on and loss of wetlands now and in the future.

Convention/Protocol	Entry in Force/ Accession	Objectives
Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), 1973	March 1979 (entry in force)	This convention regulates international trade in certain animal and plant species. Depending on the annex in which they are listed, the species are subject to export conditions (with systems of permits and special authorizations). The States must set up the necessary institutions for controlling trade in the species and issue export permits.
Convention of Biological Diversity	September 1993 (entry in force)	This convention has three main objectives: the conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources. Implementation of this convention entails drafting national strategies for the conservation and sustainable utilization of biological diversity. It is considered to be the key document for sustainable development.
United Nations Framework Convention on Climate Change, 1992	June 1992 (entry in force)	The United Nations Framework Convention on Climate Change was adopted in Rio de Janeiro in 1992 by 154 States, in addition to the European Community. It entered into force on 21 March 1994 and in 2004 had been ratified by 189 countries. This convention is the first attempt by

Convention/Protocol	Entry in Force/ Accession	Objectives
		the UN to more clearly identify what climate change actually is and how to remedy it.
Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks	January 1997 (entry in force)	To encourage cooperation between States to ensure conservation and promote the objective of optimum utilization of fisheries resources both within and beyond the exclusive economic zone.
Kyoto Protocol, 1997	April 1999 (entry in force)	The protocol stipulates legally binding commitments on industrialized countries, obliging these countries to reduce the annual average emissions of greenhouse gases by about 5.2% over the period 2008-2012.
United Nations Convention to Combat Desertification, 1994	February 2001 (entry in force)	This convention aims to combat desertification and mitigate the effects of drought through national action programs that incorporate long-term strategies. *Not directly relevant to this project.*
Stockholm Convention on Persistent Organic Pollutants	January 2006 (entry in force)	To protect human health and the environment from persistent organic pollutants.
Basel Convention Controlling Transboundary Movements of Hazardous Wastes and their Disposal (Basel Convention), 1989	August 1992 (accession)	Conscious of the damage that could be caused to human health and the environment by hazardous and other wastes and the trans-boundary movements of these wastes, the States

Convention/Protocol	Entry in Force/ Accession	Objectives
		undertake to employ strict controls to protect human health and the environment against the harmful effects of the production and management of hazardous and other wastes.
Montreal Protocol on Substances that Deplete the Ozone Layer, 1989	May 1993 (accession)	The Montreal Protocol on Substances that Deplete the Ozone Layer was designed to reduce the production and consumption of ozone-depleting substances to reduce their abundance in the atmosphere and thereby protect the Earth's ozone Layer.
Vienna Convention for the Protection of the Ozone Layer, 1985 (Vienna Convention)	April 1993 (accession)	This convention served as a framework for efforts to protect the globe's ozone layer. The objectives of the Convention were for Parties to promote cooperation by means of systematic observations, research, and information exchange on the effects of human activities on the ozone layer and to adopt legislative or administrative measures against activities likely to have adverse effects on the ozone layer.
International Convention for the Prevention of Pollution from Ships (MARPOL), 1973	May 2011	The purpose of this convention is to regulate pollution by hydrocarbons, chemical products, packaging, garbage, sewage, and atmospheric emissions. It is the reference text in the field of marine pollution prevention. The

Convention/Protocol	Entry in Force/ Accession	Objectives
		convention is primarily based on the specification of and compliance with technical rules, e.g., requirements for double-hulled oil tankers and tankers carrying chemical products, requirement for oil-water separators and to maintain documentation. The Wider Caribbean Region (WCR) (Caribbean Sea and Gulf of Mexico) became a designated Special Area under Annex V of the MARPOL Convention, which prohibits the discharge of all garbage by ship.
International Convention on Civil Liability for Oil Pollution Damage, 1969 and 1992	October 1976 (accession)	International maritime treaty adopted to ensure adequate compensation where oil pollution damage is caused by maritime accidents.
Convention for the Unification of Certain Rules of Law Relating to Assistance and Salvage at Sea Protocol of 1967	February 1913 (accession)	To provide a uniform set of rules governing assistance and salvage at sea.
International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage 1992 (1992 Fund Convention)	July 1976 (accession)	To supplement the International Convention on Civil Liability for Oil Pollution Damage, 1969; to ensure that adequate compensation is available to persons who suffer damage caused by pollution resulting from the escape or the discharge

Convention/Protocol	Entry in Force/ Accession	Objectives
		of oil from ships; and to ensure that the oil cargo interests bear a part of the economic consequences of such oil pollution damage, to the relief of the shipping industry.
Convention on Facilitation of International Maritime Traffic, as amended (FAL)	May 1998 (accession)	To prevent unnecessary delays in maritime traffic, to aid co-operation between Governments, and to secure the highest practicable degree of uniformity in formalities and other procedures.
Convention on the International Regulations for Preventing Collisions at Sea (COLREGS)	July 1997 (entry in force)	To update and replace the International Regulations for Preventing Collisions at Sea, 1960, to maintain a high level of safety at sea.
International Convention for the Safety of Life at Sea (SOLAS), 1974	February 2000 (entry in force)	The convention aims to ensure that ships of signatory countries comply with a series of safety standards and practices.
Caribbean Challenge Initiative, 2013.	May 2013	An agreement made between 9 Caribbean governments and territories committing them to accelerate and expand efforts to safeguard the Caribbean region's marine and coastal environment, further promote the sustainable use of natural resources through new commitments to conservation.
The Convention for the Protection and Development of the Marine Environment in the Wider Caribbean Region (WCR) or	June 2010	Focused on the protection of the marine environment from pollution within the Caribbean, it includes a series of specific protocols on oil spills, specially

Convention/Protocol	Entry in Force/ Accession	Objectives
Cartagena Convention. 1983		protected areas, and wildlife and land-based sources of marine pollution.
United Nations Convention on the Law of the Sea (UNCLOS) (Montego Bay Convention), 1982	July 1983 (entry in force)	This convention defines the powers of enforcement available to the states affected by an illegal act of marine pollution.
International Convention on Oil Pollution Preparedness, Response and Co-operation (OPRC) 1990	January 2002 (accession)	Article 3 of this convention requires that ships and installations at sea have an oil pollution emergency plan. The Developer must develop an Oil Spill Response Plan.
ILO Conventions	May 1976 (entry in force)	International labor standards are legal instruments drawn up by the ILO's constituents (governments, employers, and workers) and setting out basic principles and rights at work. They are either conventions, which are legally binding international treaties that may be ratified by member states, or recommendations, which serve as non-binding guidelines.

4.3 Government Institutions

Government ministries and departments that will be involved with aspects of approval and permitting of this Project include:

The Ministry of the Environment and Housing (MOEH)

The MOEH's area of responsibility includes:

- To manage, protect and conserve all land, water, air and living resources of The Bahamas, having regard to the environmental, economic, and social benefits they may confer on The Bahamas,

- To undertake, commission, and coordinate environmental studies and research relating to the environment of The Bahamas,
- Advising as to public or private sector proposals that would significantly affect the environment of The Bahamas,
- Providing advice as to procedures for the assessment and monitoring of environmental impacts,

The departments, agencies, and authorities under the responsibility of the MOEH are:

a. The department responsible for environmental health services,
b. The agency responsible for national geographic information services,
c. The authority responsible for public parks and public beaches,
d. The body responsible for forestry,
e. The body responsible for scientific research, reviewing Environmental Impact Assessments, advising on environmental projects, and administering multilateral environmental agreements.

The Department of Environmental Planning and Protection ("the DEPP")

The Department of Environmental Planning and Protection (DEPP) is under the responsibility of the MOEH. The duty of the DEPP is to promote best practices in environmental management and to minimize harm to the environment. DEPP is comprised of the Director, Deputy Director, Assistant Directors, and appointed environmental officers. The functions of the Department include the regulation, oversight, and review of Environmental Management Plans (EMP) and Environmental Impact Assessments (EIA), promoting and enforcing compliance with the Environmental Planning and Protection Act, 2019 ("the Act") and any regulations made under that Act. The Act makes it a requirement to obtain a Certificate of Environmental Clearance in accordance with prescribed regulations before commencing work on a project, and it provides that any person who commences work on a project without first obtaining a Certificate of Environmental Clearance commits an offence.

DEPP will focus on environmental issues and compliance, leading to the issuance of a Certificate of Environmental Clearance (CEC). DEPP will review and approve the Environmental Impact Assessment (EIA) and Environmental Management Plans (EMP) for The Project.

Bahamas Investment Authority

The Bahamian government's proactive economic growth and development policies are guided by The Bahamas Investment Authority (BIA), established to reduce bureaucratic delays for domestic and international investors.

The BIA operates from the Office of the Prime Minister and is a part of the National Economic Council and Investment Board.

The BIA has the following areas of responsibility:

- Develop investment policies,
- Promote investment,
- Evaluating project proposals,
- Monitor and co-ordinate project implementation,
- Administer the government's investment concessionary legislation.

All non-Bahamians or Permanent Residents seeking to do business in The Bahamas must obtain prior approval from the BIA. The application for BIA approval must be in the form of a comprehensive Project Proposal and include all of the requirements set forth in the BIA Project Proposal Guidelines. Bahamian legal counsel usually submits the formal application to the BIA along with the required supporting documents.

Depending on the nature of the proposed business activity, the relevant Government Ministry or Agency would be consulted for input:

- Ministry of the Environment.
- Ministry of Works and Transport.
- Ministry of Housing.
- Respective Family Island Local Government
- Department of Environmental Planning and Protection

Once a determination has been made, the BIA will communicate to the applicant in writing. If the determination is favorable, the BIA will issue a "project approval in principle," subject to any stipulated conditions and to satisfying the requirements of the relevant government agencies.

Ministry of Public Works

The Ministry of Public Works will authorize and provide permits for activities and maintain physical infrastructure in the country.

Department of Physical Planning

The Department of Physical Planning will authorize and provide permits for activities such as excavation, filling, roadworks, and all construction activities.

Port Department

The Port Department is responsible for inspection and licensing of boats and boat masters, as well as the collection of all revenue from commercial and private docks, mooring, groins,

causeways, etc. The Port department will authorize any permits and/or registration requirements needed for the operation of the docking facilities.

Forestry Unit

The Forestry Unit will authorize and provide permits for harvesting and removal of protected trees.

5.0 Register of Significant Aspects and Impacts

Environmental impacts of The Project are impacts to the natural communities and wildlife in the area that can be reasonably inferred, considering the footprint of impacts and known habitats on-site. Other expected impacts are those related to normal construction and operation, such as waste generation and disposal, fueling, use of potentially hazardous materials, as well as other accidents or malfunctions, which may entail an environmental component. The Register of Significant Aspects and Impacts (The Register) considers potential impacts that may be due to construction activities. The Register will be used in the development of method statements to proactively manage and mitigate potential impacts of The Project. The Register evaluates the potential impacts and assigns risk and magnitude scores. Risk Scores measure the likelihood of the impact occurring and are measured on a scale of 1-10, with 1 being unlikely to occur and 10 being highly likely to occur. Magnitude scores measure the scale of the impact if it occurs. Magnitude ranges are parameters are Low, Medium, and High. Low Impact refers to short-term localized impact reversible in 1 year. Medium Impact refers to moderate-term implications reversible in 5 years. High Impact refers to long-term impacts that are not reversible within 5 to 10 years or are irreversible.

Table 16: Register of Significant Aspects and Impacts

Significant Aspect and Impact	**Activity**	**Potential Impact**	**Environmental Management Strategy**	**Risk Score**	**Magnitude Score**
CONSTRUCTION PHASE					
Water Quality	Heavy Equipment	Oil Spills	•No hazardous substances will be permitted to escape into the exposed groundwater at the work site. •All fuel and oil spills will be cleaned up as per the Fuel Spill Prevention Plan.	5	Medium

			•Spill Kits will be located on all machinery and at designated areas on-site. •Equipment on site will be well-maintained. All leaking equipment will be removed from the site and repaired before being brought back on-site.		
Erosion and Sedimentation	Utility Installation	Turbidity	•Limit trench size. •NO dewatering directly into existing vegetation or exposed groundwater. •Turbidity monitoring should be done during marine works to ensure that turbidity does not exceed twenty-nine Nephelometric Turbidity Units (29 NTU).	6	Medium
Erosion and Sedimentation	Land clearing, excavation and grading	Turbidity and water contamination	•Sediment and erosion control methods (such as silt fences) will be in place prior to and during construction.	3	Low
Air Quality	Earthworks and Material Stockpile.	Dust pollution and airborne pollution	•Water to be used as a dust retardant.	4	Medium

	Use of heavy machinery.		•Fencing will be installed to shield surrounding areas from dust and aggregates. •Do not accumulate and burn waste on site. •All dump trucks will be required to use tarpaulins when transporting material to and from the site. •All machines will be well maintained		
Noise and Light Quality	Construction	Increase in noise and light pollution.	•Avoid usage of equipment with extra noise. •Machines should be turned off when not in use. •The Contractor will inform the surrounding offices and community, prior to operations, of works that bear the risk of nuisance and accidents. •Strategic placement of lights away from residential and commercial areas. •Tilting lights downwards. •Using shielding to restrict the glare of lights.	9	Medium

			•Construction activities to be restricted to daylight hours between 0700 hrs. and 1900 hrs		
Solid Waste	Construction Activities	Construction Waste	•Waste bins should be placed strategically around site. Bins should have signs posted on them listing or showing symbols of items that can be disposed of into each bin. •Refuse and wastes should be removed from the site regularly by a licensed Contractor. •Waste materials will be disposed of at the New Providence Ecology Park (NPEP). •Construction waste should be recycled and reused on site were feasible before being transported to NPEP. •All construction waste that cannot be recycled or reused on site should be stored in a lidded container in the laydown area.	8	Medium

			•Creation of a concrete washout station.		
Hazardous Waste	Heavy Equipment Operation	Hazardous Waste (Equipment Fuel spills, Used Oil concrete washout and asphalt handling)	•Proper usage and disposal of oil spill material. •Hazardous waste to be stored in lidded containers in a safe place that is lined and bermed, and away from environmentally sensitive areas. •Provisions should be made for management and disposal at NPEP. Material should be removed as its created. •Pollution prevention practices should be implemented. A Furl Spill Prevention plan will be outlined in the Arawak Cay LNG Project Environmental Management Plan (EMP).	7	Medium
Solid Waste	Land Clearing (minimal)	Vegetative Waste	Proper disposal of invasive species according to the	10	Low

			Invasive Species Management Plan .		
Sewage and Refuse Disposal	Installation of Portable Potties	Water Quality	•Portable toilets and handwashing stations will be used during construction. •Portable potties will be secured to prevent falling over. •There should be adequate numbers of portable potties placed portable potties. •Facilities to be stationed away from trenches and waterbodies. •Sewerage to be collected by a licensed Contractor.	8	Medium
Marine and Terrestrial Ecosystem	Utility Installation Land Clearing	Habitat Loss	•Cable installation to follow the proposed route. •LNG plant to be constructed in an human altered area. •Biodiversity in this zone is considered low, with native flora and fauna largely	10	Low

			displaced or restricted to isolated pockets. •Removal of invasive species. •Seagrass beds will be avoided where feasible.		
Traffic and Transport	Construction Activities	Navigation hazard, collisions, and road congestion	•The transportation of the waste and other materials should be in a safe manner considering road traffic and boating regulations. •All crane barges should be kept within the LNG cable line construction area. •The schedule for the transportation should be made not to coincide during peak traffic hours. •Flagmen will be station at the site's entrance. •Signage will be placed to alert the community of ongoing construction activities.	6	Low

Safety for Workers	Construction activities	Accidents and Injuries	•The mandatory use of PPE (helmets, safety vest, PFDs, masks, gloves, life vest, and safety boots) by workers depending on nature of work. •All workers are familiar with site emergency response plan and safety procedures. •All workers are familiar with material handling procedures. •First responders identified and present on site.	5	High
OPERATIONAL PHASE					
Flooding	Increased in paved surfaces	Increase in standing water in The Project site.	•Grading will be done to elevate the site. •Development of an adequate drainage system. •Drainage retention ponds or swales will be designed to collect and drain water at a rate fast.	4	Medium

			•Buildings will be elevated. •Regular cleaning and maintenance of the drains. •Paved surfaces should be constructed using permeable material to increase absorption rated and reduce runoff.		
Sewage and Refuse Disposal	Installation of Sewage system	Water Quality	•During the operational phase, sewage and wastewater will be disposed of via WSC municipal lines.	4	Low
Air and Noise Quality	Emissions from and Vehicles and equipment such as generators	Pollution	•Operating equipment must have preventive maintenance in compliance with applicable environmental regulations to prevent air pollution. •Generates, turbines, and other operating equipment should have catalytic converters in good condition.	6	Medium

			•Air-filtration systems will have regular inspections and maintenance. •Soundproof housings will be installed around noisy equipment such as turbines, and pumps. •Silencers and mufflers will be installed on exhaust systems, and gas release points. •Equipment designed for quiet operation will be selected. •If equipment is maintained on site, any maintenance or testing programs will be done during daytime working hours to prevent any discomfort or nuisance to neighbouring communities.		
Water Quality	LNG Transport and Storage.	Water Contamination Pollution	•For safer storage and transport, natural gas can be	6	High

	Storage of cryogenic, toxic, or flammable fluid.		cooled down to its liquid form. •All storage tanks will be doubled walled. •LNG Storage and Regasification Facility will be automated, controlled by PLC with SCADA workstation with provision for remote monitoring. •All valves and hoses used in the transport of LNG will be regularly inspected to ensure they are in good condition. •All broken or worn equipment should be replaced promptly.		
Solid Waste	Operational Activities	Increase in Domestic Waste	•Implement an Operational Solid Waste Management Plan. •Removal of waste from the site by a licensed company regularly.	7	Low

			•Materials will be disposed of at the New Providence Ecology Park (NPEP). •Waste should be recycled and reused where feasible before being transported to NPEP. •All domestic waste that cannot be recycled or reused on site should be stored in a lidded container until it can be removed by a licensed Contractor.		
Hurricane Risk	Coastal Location Facility Operations	Storm surge, flooding, high winds, and fire ignition. Leaks and explosions due to storm-related features.	•Measures outlined in the Emergency Response Plan should be followed. See the Arawak Cay LNG Project EMP. •Elevate critical infrastructure above surge levels. •Use hurricane-resistant designs and materials. •Maintenance of the drainage system, which will	8	High

			consist of oil interceptors in places such as the parking lot.		

6.0 Potential Environmental Impacts and Mitigation Measures

Environmental impacts are changes in the natural environment caused by development that can adversely affect the surrounding community, air, freshwater, marine, and terrestrial environments. Direct and indirect actions can cause environmental impacts, and take into consideration the footprint of impacts and known habitats on-site. Impacts detailed below are determined by activities associated with normal construction and operation, which can negatively affect the natural environment and/ or may entail an environmental component.

Site-specific management tools have been developed for the site, tailored to address the unique environmental conditions and challenges of each area. These management tools will be implemented to ensure consistency in environmental protection and project execution.

These tools, derived specifically for The Project, will guide the development in minimizing environmental impacts, preserving local ecosystems, and supporting sustainable development by integrating tailored management strategies. The Project is well-positioned to achieve the pre-set goals while maintaining environmental integrity.

6.1 Impacts on the Physical Environment

6.1.1 Erosion and Sediment Impacts

Erosion and sedimentation can be harmful to the environment, as they can cause water contamination. Activities that can potentially increase erosion and sedimentation include land clearing and earthwork activities, as the movement of heavy machinery can lead to the displacement of soil. Given the coastal location of The Project, eroded materials could be transported directly into the marine environment, leading to increased sedimentation and decreased water quality. Extreme rainfall or hurricane events may exacerbate these risks if disturbed soils are not stabilized.

During the construction phase, site clearing will be minimal as the area is already a heavily human-altered environment. An Erosion and Sediment Control Plan will be developed and outlined in the Arawak Cay LNG EMP to help mitigate against erosion impacts. It may include the use of silt curtains for the exclusion of sediment into trenches or coastal environments, any retained during times of clearing and earthwork activities. These barriers should be actively maintained throughout construction.

6.1.1.1 Turbidity

During the construction activities, impacts to the marine environment would include an increase in turbidity during the placement of the LNG transmission cable. Control measures to reduce turbidity in the marine environment are extremely important as suspended sediments can block light to aquatic plants such as seagrass, smother aquatic organisms, and carry contaminants and pollutants, and pathogens, such as lead and bacteria.

Mitigation measures to be implemented to reduce turbidity monitoring. Turbidity monitoring should be done during any marine works to ensure that turbidity does not

exceed the threshold of twenty-nine Nephelometric Turbidity Units (29 NTU). In the event turbidity exceeds the threshold, work will stop to allow sediment particles to settle, after which work will resume.

6.1.2 Air Quality Impacts

The construction activities, such as material handling and the use of heavy equipment, can impact the air quality.

Land clearing, grading, excavations, and other construction activities all have the potential to increase dust accumulation on the site. Dust can be a hazard to human health and can cause eye irritation and respiratory issues. To reduce the impact of dust, the following activities should be implemented:

- Water is to be used as a dust retardant as needed.
- Screening and fencing should be used to reduce wind, improve aesthetics, and mark the limit of works.
- The use of Proper Protective Equipment (PPE), including dust masks and eyewear or safety glasses.
- Dump trucks moving loose material are to be covered with tarpaulins.
- Minimizing the height when dumping or transferring.

Air-borne pollution

The minimization of air-borne pollution is a key component of environmental management of the site. Construction phase air quality impacts shall be minimized or avoided by the incorporation of air quality control measures. The installation and application of air quality controls during the construction phase shall be in accordance with the following principles:

- All equipment used and all facilities erected on site are to be designed and operated to control the excessive emission of dust, fumes, and any other air impurity into the atmosphere;
- Contractor and Sub-contractors will maintain all construction equipment to reduce exhaust emissions;
- The Engineer will visually monitor levels of dust deposition and air quality, the effectiveness of dust emission controls, and the construction site and the impacts of any nuisance on adjoining properties.

6.1.3 Noise Quality Impacts

Construction Phase

The Project construction activities have the potential to affect nearby businesses and residences. Noise nuisance during the construction phase is expected to be low as the site is located next to a busy port. To ensure that noise generated by activities remains low and does not disturb the surrounding environment, construction operations should be restricted

to daylight hours between 0700 hrs. and 1900 hrs. Any reason to work outside these hours to speed up the progress of work, advance notice will be given, and specific requests will be reasonably accommodated.

To manage noise impacts during construction hours, contractors shall utilize accepted noise control techniques, such as:

- Maintaining equipment in good working order,
- Implement the use of best available control technologies to reduce noise, such as mufflers and silencers,
- Implement a speed limit to slow vehicles and limit noise generation,
- Turn off idling equipment when not in use.

Operational Phase

An increase in noise level during the operation of an LNG plant can be significant due to the use of large turbines, compressors, and pumps, and other equipment needed to run the plant. LNG plants can produce noise levels above eighty-five decibels (85 dB), which is commonly recognized as the threshold for potentially harmful exposure that may cause hearing damage over time.

While harmful noise level is not expected to cause significant discomfort for nearby recreational tourism activities or to nearby residential communities, there is a potential for noise nuisance, especially during the evening and night hours.

To mitigate against this, the following mitigation measures will be incorporated where feasible:

- Soundproof housings will be installed around noisy equipment such as turbines and pumps.
- Silencers and mufflers will be installed on exhaust systems and gas release points.
- Equipment designed for quiet operation will be selected.

6.1.4 Solid and Hazardous Waste Impacts

Waste generated during the construction and operation phases can negatively impact the site, surrounding ecosystems, and the neighboring community. Solid waste, especially materials that take a long time to degrade, can have numerous harmful effects on wildlife and marine ecosystems, often due to improper waste management.

Solid waste poses a moderate risk during construction activities. The project should aim to minimize waste production and maximize recycling of materials. Waste bins should be placed strategically around the site. Bins should have signs posted on them listing or showing symbols of items that can be disposed of. Any debris that enters open water should be

removed as quickly as possible, and all hazardous waste spilled into the environment must be reported.

6.1.4.1 Waste Disposal during Construction

Improper disposal of waste can attract pests such as flies, mosquitoes, and rodents, which may spread disease and pose risks to worker health and nearby communities. The risk of pest infestation increases when human presence and food sources are concentrated at a project site without proper controls. Additionally, unmanaged waste has the potential to enter the marine environment through wind or stormwater runoff, contributing to pollution, harming marine life, and degrading water quality.

To mitigate these risks, a comprehensive Solid Waste Management Plan will be implemented throughout the construction phase. The plan will emphasize waste minimization, segregation, safe handling, and timely removal from the site. Waste will be collected regularly by a licensed Contractor and transported to the New Providence Ecology Park (NPEP) or other Government-approved facilities for final disposal.

The appointed waste Contractor will be required to comply with all applicable legislation and best management practices, including provisions under the Environmental Health Services Act. Construction personnel will receive training in proper waste handling and disposal to ensure consistent implementation of the plan.

6.1.4.2 Vegetative Waste

Vegetative waste will be created during clearing and grubbing activities on site. All vegetative waste will be transported to NPEP. Invasive species encounters should be sorted separately and should not be used as mulch to prevent spread throughout the site. The entire tree and root system of the invasive species should be carefully removed manually or by heavy equipment.

6.1.4.3 Hazardous Waste

There is the potential for hazardous waste impacts associated with the construction and operational phases.

Construction Phase

Hazardous materials such as concrete, paint, solvents, and other chemicals may be high in pH and are considered harmful to the surrounding environment and neighbouring communities.

Protection of open water and any other sensitive environments is of most importance; therefore, there shall be no contact of hazardous material with water bodies through spillage, hosing off surfaces, rain, cleaning of tools, or concrete washout.

The following mitigation measures will be employed:

- A concrete and equipment washing site will be bunded, lined to contain any concrete and chemicals. All accepted washing locations must be cleaned up before demobilization. Any excess material shall be removed upon The Project's completion and transported to NPEP.
- All hazardous materials brought on-site should be accompanied by Safety Datasheets (SDS).
- All equipment and hazardous material (such as used absorbent pads) will be stored in a designated waste bin to reduce the risk of spills and pollution events into the environment. Storage facilities should be free from obstruction, structural defects, and covered storage to prevent the potential of mixing with water, and only used to store hazardous waste.
- Appropriate signage should be used to depict hazards in the area, as well as a "NO Smoking" sign.
- Storage facilities will be inspected at least once a day by designated staff to check for leaky containers. Access should be limited to these designated persons.
- Hazardous waste storage facilities at the site will have disposal containers that are covered, sealed to prevent leaking, and positioned on an impervious surface as far from any water as possible. Secondary containment for all disposal containers should be one hundred and ten percent (110%) of the maximum volume of the container.
- Appropriate spill containment and clean-up equipment will be easily accessible near hazardous waste storage facilities.
- Disposal of all hazardous waste utilized or generated during construction will occur off-site by a licensed contractor at a licensed facility as per DEHS requirements.

Operational Phase

An LNG plant involves complex industrial processes that can generate various forms of hazardous waste, which must be carefully managed to avoid environmental and health impacts. Common types of hazardous waste found on an LNG plant include:

- Chemical solvents,
- Paints and coatings,
- Sludge from treatment systems,
- Used filters and rags,
- Batteries and e-waste, and
- Spent catalyst.

Improper hazardous waste management and disposal can lead to environmental and health risks for workers and surrounding communities. Hazardous waste can potentially cause soil and groundwater contamination from spills, and increase air pollution due to evaporation of

volatile compounds. Potential health risks include exposure to toxic substances, inhalation of chemicals, and accidental fires and explosions.

A proper Operations Waste Management Plan and Operational Hazardous Waste Management should be established for the management of waste at the plant. The plan should meet the standards set by DEHS and include the Environmental Health Service Act regulations for the domestic, hazardous, and chemical waste disposal. The plan should include the measures outlined in the construction phase as well as proper handling, transfer, and transport of LNG and any other substances used.

6.1.5 Sewage and Waste Refuse

During the construction phase, portable potties will be distributed throughout the site and will require weekly maintenance. Portable toilets should be serviced bi-weekly by a licensed company. To prevent leaching of wastewater into the groundwater or surface bodies, any portable toilet(s) that are on-site should be secured to avoid vandalism and to prevent them from tipping in windy conditions. Toilets must be located more than one hundred and fifty feet (150 ft.) from any trenches, and open water bodies.

During the operation of the LNG plant, waste generated will be directed down the WSC municipal pipelines.

6.1.6 Fire and Hurricane Risks

The Bahamas is located within the Atlantic Tropical Cyclone basin. This basin includes much of the North Atlantic, the Caribbean Sea, and the Gulf of Mexico. Due to the geographic location, the entire Bahamas experiences tropical cyclones during hurricane season from June 1st to November 30th. The Saffir-Simpson Hurricane Wind Scale is a one (1) to five (5) rating based only on a hurricane's maximum sustained wind speed (see Table 17). All hurricanes can cause wind damage and significant loss of life due to the strength of their winds.

Table 17: Hurricane Categories

Category	Sustained Winds (mph)	Types of Damage due to Hurricane Winds
1	74-95	Very dangerous winds will produce some damage
2	96-110	Extremely dangerous winds will cause extensive damage
3	111-129	Devastating damage will occur
4	130-156	Catastrophic damage will occur
5	157-higher	Catastrophic damage will occur

Based on Historical data, Category 3-5 hurricanes have caused widespread damage to infrastructure, ecosystems, and communities across the islands. The coastal proximity of The Project site increases vulnerability to storm surge, flooding, and winds. Buildings, utilities,

and access roads may be compromised by wind damage. Coastal species in The Project's area may suffer from sedimentation, erosion, and salinity changes. Mitigation measures include:

- Elevate critical infrastructure above storm surge levels.
- Use hurricane-resistant construction materials and designs.
- Establish emergency evacuation routes and shelters.
- Implement coastal buffer zones with native vegetation to reduce erosion and absorb storm energy.

Fires

The Project site is vulnerable to fire risk during the construction and operational phase. Fires can endanger the lives of personnel on site, as well as destroy the infrastructure. During construction, machinery use, and waste disposal methods could introduce ignition sources, increasing the likelihood of fires or explosions.

During the operational phase, a significant risk in LNG facilities is the uncontrolled release of cryogenic, toxic, or flammable fluids. The handling and accidental release of LNG (in its gas form) can also make LNG plants prone to fire and explosions. These releases can happen in different areas of the processing system. The impact of these releases varies based on what they encounter and whether they are ignited. In summary, the main hazards associated with LNG facilities can be divided into seven categories:

1. **Temperature Hazards:**
    a. Cryogenic liquids can lead to material embrittlement if that material is not designed to handle them, and freeze burns if the personnel come into contact with them.
    b. Burns may also occur from hot vapor released from turbines, boilers, and engines.
2. **Toxic Hazards:** Releases of hydrogen sulfide (H_2S) or ammonia are toxic and pose serious health risks.
3. **Asphyxiation Hazards:** The plant can release gases that can displace oxygen in an area, creating a risk of suffocation.
4. **Pool Fire:** Accidental releases and immediate ignition of a pool of liquid can result in a long-lasting fire on the ground or on the surface of the water.
5. **Jet Fire:** Accidental releases of pressurized gases that are immediately ignited can lead to a high-heat flux jet fire.
6. **Flammable Vapor Dispersion:** If a hazardous liquid is released, but there is delayed ignition, a flammable cloud can be created. If this cloud ignites, it can result in a brief but intense flash fire that endangers personnel.
7. **Vapor Cloud Explosion (VCE):** If a hazardous liquid is released in an enclosed space, but there is delayed ignition, it can cause an explosion and generate a pressure wave.

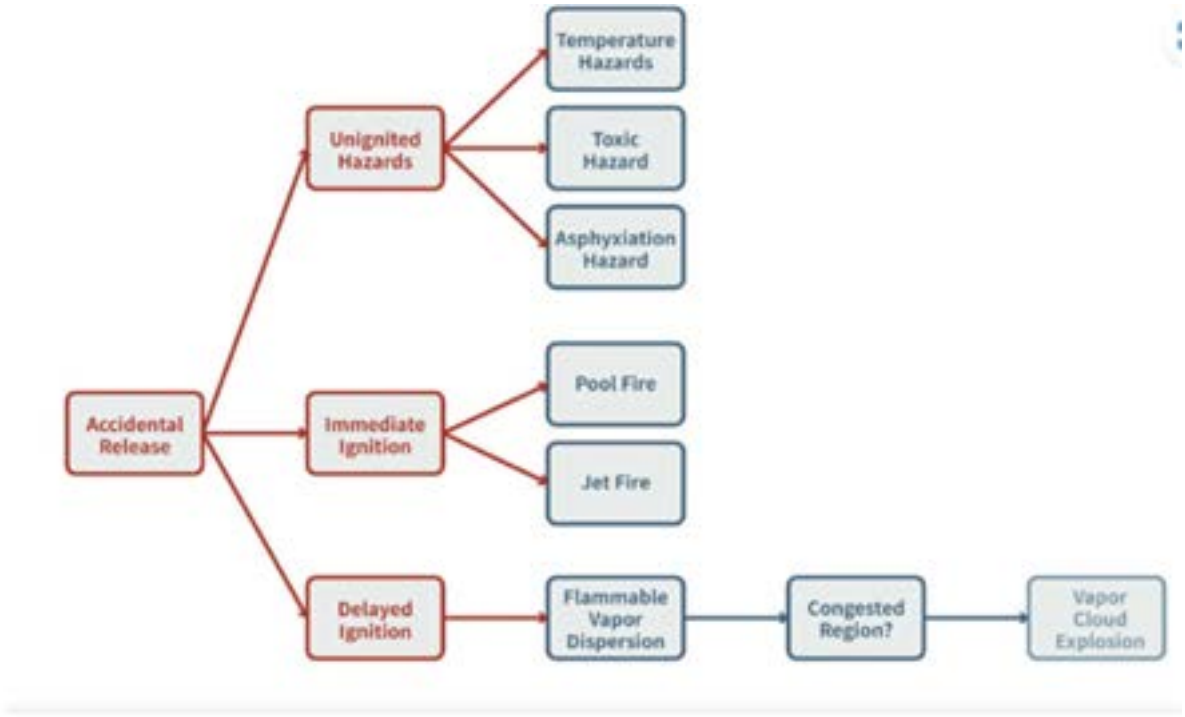


Figure 16: LNG Facility Hazards

Mitigation measures include:

- Maintain defensible space around structures by clearing flammable vegetation.
- No Smoking will be permitted on the site.
- Equip the site with fire extinguishers, water tanks, and trained personnel. Fire extinguishers of each class should be on site, and all extinguishers should be inspected regularly.
- Coordinate with local fire services for rapid response planning.
- Conduct fire drills regularly.

A full Fire Control Plan will be outlined in both the Arawak Cay LNG Project Construction and Operations EMP.

6.1.7 Hydrologic Impacts

6.1.7.1 Water Quality

Construction activities can result in potential contamination impacts as a result of petrochemicals from heavy equipment, hazardous chemical spills, hazardous material storage, and increased turbidity.

6.1.7.1.1 Fuel, Oil, and Chemical Spills

To help preserve the site and reduce the risk of water contamination, identifying the main source of potential releases during the construction phase is important. No hazardous substances will be allowed to escape into the open water at the work site. All hazardous products should be disposed of by a licensed Contractor. A receipt should be produced and attached to the hazardous waste reporting. The following measures will assist in preventing water contamination.

- Proper Fuel Management to prevent spills.
- Use biodegradable (non-mineral) hydraulic oils when working over water.
- Spill Kits will be placed on all operating machinery, boats, and barges.
- The construction heavy equipment used on-site must be well-maintained. Equipment shall be inspected and repaired, if necessary, by the contractor before site mobilization. All leaking or broken machinery should be moved off-site and repaired.
- Idling must be kept to a minimum. Any equipment not in use for extended periods of time must be switched off safely.
- All hazardous material storage areas must be located away from storm drains, shorelines, or sensitive habitats, and within contained areas.

6.1.7.1.2 LNG Transport and Storage

During the operational phase, a significant risk in LNG facilities is the uncontrolled release of hazardous fluids. The handling and accidental release of LNG can cause contamination of the marine environment.

The Arawak Cay Power Plant project will receive twelve thousand five hundred cubic meters (12,500 m3) of LNG, approximately twice a month, at Arawak Cay. The vessel has a maximum draft of eighteen feet (18 ft.), which provides ten feet (10 ft.) of clearance alongside Arawak Cay.

The accidental and uncontrolled release of LNG will be managed by the following:

- For safer storage and transport, natural gas can be cooled down to its liquid form.
- All valves and hoses used in the transport of LNG will be regularly inspected to ensure they are in good condition.
- All broken or worn equipment should be replaced promptly.
- All storage tanks will be double-walled. Tanks should be regularly inspected to ensure there are no leaks.
- LNG Storage and Regasification Facility will be automated, controlled by a Programmable Logic Controller (PLC) with Supervisory Control and Data Acquisition (SCADA) workstation with provision for remote monitoring.

6.1.7.1.3 Reverse Osmosis (RO)

The waste brine from the seawater RO desalination plants is high in salt concentration. If discharged into open water, the high concentrations of salt can affect the salinity of the marine environments and impact marine life. To manage contamination, the brine seawater will be disposed of down a deep well.

6.1.8 Flooding and Storm Water Management

Stormwater management for The Project will address both the quality and quantity of runoff generated during construction and operations. The objective is to minimize flooding risks, reduce erosion and sedimentation, and prevent the transport of pollutants into adjacent coastal and marine environments. Given New Providence's low-lying topography and exposure to intense rainfall events, effective management is essential to safeguard natural water bodies and public infrastructure.

Several activities during the construction phase have the potential to create flooding, including dewatering of trenches for utilities and the removal of any ground material. These activities have the potential to cause a reduction in the absorption, evaporation, and infiltration rates of water into the soil. This will increase in standing water around the site and increase the risk of flooding during significant rains, extreme weather conditions, including effects from climate change, and hurricane season.

As The Project nears completion, the increase in impervious surfaces for buildings, roads, roofs, and gutters can increase the amount of water entering the proposed drainage system.

A Storm Water Management Plan will be developed and outlined in the Arawak Cay LNG Project EMP to outline mitigation measures to prevent and control flooding. The Storm Water Management Plan will include measures such as:

- The construction of drainage retention ponds or swales designed to collect and drain water at a fast rate.
- Buildings should also be elevated to reduce the risk of flooding in the event of extreme weather and flooding conditions.
- Establishment of flood control ditches to allow to reduce the risk of rain-induced flooding.
- Regular cleaning and maintenance of the drains.
- Revegetation of areas to reduce erosion and slow the rate of stormwater runoff.
- Constructing sedimentation basins to temporarily store stormwater.

6.2 Biological Impacts

6.2.1 Habitat Degradation Impact

Habitat degradation refers to the process by which a natural habitat becomes incapable of supporting native species due to human activities or natural events.

The construction and operation of the LNG facility at The Project site Biodiversity in this zone is considered low, with native flora and fauna displaced or restricted to isolated pockets.

The installation of the transmission cable on the seafloor will lead to minimal displacement of benthic organisms and the alteration of the benthic habitats.

To mitigate further habitat degradation, the following will be implemented:

- Construction activity to be limited to the site footprint.
- Fencing to be installed where applicable.
- Turbidity will be monitored during all marine works.

6.2.2 Wildlife Impacts

Emphasis will be placed on observing the presence and management of all wildlife on site.

Land clearing can cause a decrease in native wildlife due to habitat loss and habitat fragmentation. Avian species observed on site and various invertebrates may be displaced due to direct disturbance or degradation of ecological conditions essential for foraging, nesting, or shelter. The proper management of wildlife, specifically nesting birds, is extremely important.

Impacts on avian species are expected to be low, as species observed have adapted to or have become accustomed to Human-Altered Environments.

During construction, if wildlife is encountered (e.g., nesting birds, injured fauna, juvenile animals), construction should be halted immediately and that information reported. Before clearing vegetation or cable installation, the environmental manager or wildlife specialist will schedule inspections for wildlife, installation of protective fencing, pre-stressing, and onsite briefings for contractors.

During the operational phase, an Employee Wildlife Management education training programme should be designed and implemented. This programme should include prohibiting hunting and harassment of wildlife within The Project vicinity and protocol in the event of a wildlife encounter.

A Wildlife Management Plan will be outlined in the EMP detailing measures for preventing harm to wildlife present on site, and the steps staff should take by staff should they encounter any wildlife on site.

6.2.3 Impacts to the Marine Environment

Emphasis will be placed on observing the presence and management of all wildlife on-site.

Impacts to marine fauna and epifauna include habitat loss for sessile marine life and displacement for motile species. Prior to placement of the pipeline, the area will be assessed to ensure that there are no motile epifauna present within the direct footprint. Any identified motile epifauna will be removed from the area and relocated to a similar habitat. Turbidity

should be carefully monitored to ensure that wildlife (sessile and motile) in the area to be indirectly impacted are not significantly affected.

As seagrass habitats are ecologically important as well as protected in The Bahamas, the transmission cable will avoid disturbing seagrass where possible.

6.3 Socio-Economic Impacts

6.3.1 Visual and Aesthetic Impact

The Project will impact the aesthetics of Arawak Cay, as the visibility of the LNG facility from various locations could result in a negative public opinion. However, managing public opinion with aesthetic designs does not account for the appropriate requirements needed for an efficient facility. Therefore, it is essential to consider the visual impact but within reason, to ensure The Project facility can still complete its aim.

6.3.2 Impacts on Neighborhoods and Communities

The Arawak Cay LNG Project is anticipated to affect the local neighborhoods and communities. This section evaluates the potential impacts during both the construction and operational phases of The Project.

Construction Phase Impacts

During the construction phase, The Project is expected to generate several impacts on the local neighborhoods and communities:

- **Noise and Vibration:** The use of heavy machinery and construction activities will generate noise and vibrations, which may disturb residents and businesses. Measures such as noise barriers and restricted working hours will be implemented to mitigate these impacts.
- **Air Quality:** Dust and emissions from construction vehicles and equipment may affect air quality in the surrounding areas. Dust control measures, such as water spraying, will be employed to minimize these impacts.
- **Public Safety:** The presence of construction sites and heavy machinery may pose safety risks to the local community. Safety measures to be implemented include fencing of construction areas and clear signage outlining construction zones.

Operational Phase Impacts

Once operational, the LNG facility will generate regular impacts associated with its daily operations:

- **Ambient Air Quality:** The operation of the LNG facility may result in emissions that could affect air quality. The facility will be equipped with advanced emission control technologies to minimize these impacts.
- **Noise:** The operation of the facility, including the movement of LNG tankers and other vehicles, may generate noise that could disturb the local community. Noise mitigation

measures, such as soundproofing and operational restrictions during night hours, will be implemented.

Additional measures to be implemented to minimize impacts on neighborhoods and communities include:

- **Community Engagement:** Regular communication with the local community will be maintained to keep them informed about The Project and address any concerns. Public meetings and information sessions will be held to ensure transparency and community involvement.
- **Environmental Monitoring:** Continuous monitoring of air quality and noise levels will be conducted to identify and address any emerging issues promptly. Adjustments to mitigation measures will be made, as necessary.

6.3.3 Traffic Impacts

The Project is anticipated to have impacts on local traffic patterns and infrastructure, as it is currently serviced by a network of local roads that connect to major roads through Nassau (e.g., West Bay Street). The existing traffic volume is moderate, with peak hours typically occurring around the morning and afternoon commutes.

An influx of construction vehicles, including trucks and machinery, will lead to higher traffic volumes, resulting in temporary congestion, particularly during peak hours. The increased load from heavy vehicles could also accelerate the deterioration of road surfaces, necessitating more frequent maintenance and repair. To mitigate these impacts, a comprehensive traffic management plan should be developed. This plan will include.

- Designated haul routes.
- Scheduling deliveries during off-peak hours.
- Notice should be given to the community of the commencement of work and possible traffic inconveniences.
- Signage will need to be placed at the site entrance and exit, and the main thoroughfare.
- Heavy machinery should have a banksman to assist in manoeuvring on and off site.
- Flagmen should be placed strategically at key intersections.

Once operational, the facility will generate regular traffic associated with its daily operations.

6.3.3.1 Boating Traffic Impacts

Project activities have the potential to negatively affect marine traffic flow due to the movement of the barge to and from The Project site. The increase in movement of heavy machinery can cause impacts to the safety of other boaters in the area and cause discomfort to the community.

To prevent any boating accidents during construction, the following strategies should be employed:

- The transportation of the waste and other materials should be in a safe manner, considering boating regulations.
- The Port Department should be made aware of all movements of marine equipment.
- All barges to be kept within the marina construction area.
- All navigational hazard lights should be checked daily.
- Ensure goal posts and warning signs have been erected in appropriate areas before commencement of works.

6.3.4 Economic Impacts

Small Island developments face economic challenges due to factors such as small population size, remoteness from international markets, high transportation costs, vulnerability to exogenous economic shocks, and sensitive land and marine ecosystems. These challenges make access to sustainable and feasible sources of energy unreliable.

According to a publication from The Oxford Institute for Energy Studies, the cost breakdown by LNG plant area (LNG liquefaction plant) can be estimated. Pre-operational cost drivers include the range and complexity of The Project itself, but marine facilities, including jetties and extensive dredging (CAPEX directly connected to the building of a jetty), are also highlighted as a major cost-generating item of the budget.

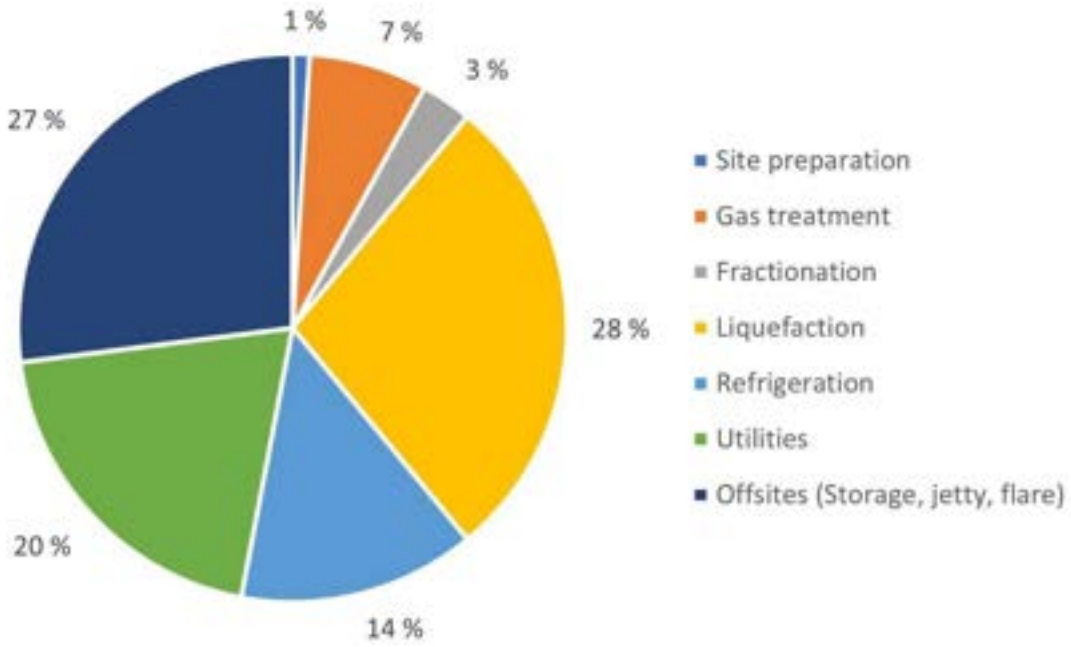


Figure 17.A Cost Breakdown by Plant Area (The Oxford Institute for Energy Studies).

CAPEX for regasification plants typically consists of costs associated with vessel berthing, storage tanks, regasification equipment, send-out pipelines, and metering of new facilities. Hence, this link in the value chain highlights cost drivers connected to the interface between LNG ships and onshore facilities.

Construction costs (CAPEX) account for a substantial part of a project investment, but also considering the sum of operational costs (OPEX) across the entire supply chain is key to identifying potential sources of financial risk. Combined figures from PwC and a publication from the journal Industrial and Engineering Chemistry Research (I&EC) break down the operating cost for a general value chain as follows:

- Upstream development: 10-11% of costs.
- Refrigeration and liquefaction: 40-42% of costs.
- Shipping/Transportation: 20-30% of costs.
- Regasification and distribution: 20-27% of costs.

The Project is poised to stimulate the local economy through cheaper and more reliable sources of energy. The Project is also expected to generate economic benefits for the local community, including job creation and increased business opportunities. The construction phase will create numerous job opportunities for residents, and the influx of construction work will benefit local suppliers. In order to maximize the positive economic impacts, priority will be given to hiring locals for both construction and operational jobs.

During the operational phase, the facility will employ a significant number of skilled and unskilled staff, and local businesses may benefit from increased demand for goods and services.

7.0 Environmental Management Plan

The Environmental Management Plan (EMP) is a document designed to assist with achieving the Health, Safety, Social and Environmental (HSSE) Policy to ensure that all its activities during both the construction and operational phase of The Project are conducted in a manner that results in minimum adverse impacts on the environment.

The EMP will outline potential impacts associated with project activities and contain detailed mitigation measures and best management practices that will be employed by management, staff, and sub-contractors during construction to reduce, avoid, or mitigate against impacts. The EMP will also outline national and international legislative requirements, site-specific procedures, detailed monitoring plans, and training guidelines to ensure environmentally responsible project execution. An outline of the EMP can be found in Appendix G.

Potential Impacts associated construction of The Project that will be included in the EMP are:

Table 18: Environmental Impacts of The Project.

Physical Impacts	Biological Impacts	Socio-Economic Impacts

• Air, dust, Noise Pollution • Noise Pollution • Waste Impacts • Sewage and Refuse Disposal. • Erosion and sedimentation • Fire and Hurricane Risk • Hydrological Impacts • Flooding and Storm Water Impacts	• Habitat Degradation • Impacts on Wildlife • Impacts on Marine Environment.	• Traffic Impacts • Community Impacts • Economic Impacts • Visual and Aesthetic Impact.

8.0 Stakeholder Engagement

Stakeholders can be defined as individuals or groups who are directly or indirectly affected by a project, as well as those who may have interests in a project or the ability to influence its outcome, either positively or negatively. To ensure a meaningful and successful project, the proper identification of stakeholders is essential (See Appendix H).

8.1 Types of Stakeholders

Stakeholders in a project can generally be divided into internal and external groups.

Internal stakeholders are those directly associated with or involved in The Project and who operate within its organizational structure. For The Project, they include:

- The Project Sponsor,
- The Government of The Bahamas,
- The Ministry of Energy and Transport as the Executing Agency,
- Bahamas Power and Light (BPL),
- Water and Sewage Corporation (WSC),
- Department of Physical Planning,
- Department of Environmental Planning and Protection (DEPP),
- Port Department,
- Arawak Port Development,
- The Project team,
- Consultants,
- Contractors,
- Sub-Contractors, and

- construction employees.

External stakeholders, on the other hand, are not directly involved in the project's operations but are still impacted by its actions and outcomes. These may include:

- Government agencies such as Bahamas Ministry of Tourism, Investments, and Aviation,
- Bahamas Maritime Authority
- Customers,
- Suppliers,
- Advocacy groups and Non-Profit groups - Bahamas Chamber of Commerce and Employer's Confederation, and Waterkeepers Bahamas,
- NGO's – Bahamas National Trust (BNT), The Nature Conservancy (TNC), and Bahamas Reef Environment Educational Foundation (BREEF), Bahamas,
- Cruise Operators,
- Local Businesses – Transportation providers, vendors,
- Tourist, and
- The public.

8.1.1 Vulnerable Groups

Throughout The Bahamas in general, there are several identifiable disadvantaged or vulnerable groups who, because of their prevailing characteristics, face the risk of being excluded from the benefits of this project if not adequately engaged. These include low-income communities, women, people with disabilities, and immigrant communities. To ensure that The Project does not further exacerbate existing exclusion errors, special efforts will be made to engage persons from these vulnerable groups and mitigate risks of social exclusion and elite capture (whereby public resources are biased for the benefit of socially advantaged groups to the detriment of disadvantaged groups). See Appendix H for the full Stakeholder Engagement Plan.

8.2 Stakeholder Engagement Plan

An engagement and consultation plan will be developed for this Project, which will guide how stakeholders are engaged throughout The Project life cycle. Methods of engagement will be tailored for stakeholders, including but not limited to the aforementioned (see Table 19).

8.2.1 Stakeholder Analysis

Stakeholder analysis via stakeholder mapping is an important assessment tool that will aid The Project team in assessing how stakeholders can collaborate with or hinder the realization of what has been planned, and to begin identifying good ideas for defining strategies to work with these actors.

The Stakeholder Analysis Matrix below (see Table 19) helps in the assessment and prioritization of the identified stakeholders and allows The Project team to design strategies addressed to the different groups. The result of the interaction of the factors in this matrix suggests the type of management to be done with each group.

Table 19. Stakeholder Analysis Matrix

Stakeholder	Objectives or Targets	Level of Interest	Level of Influence	Possible Stakeholder Actions	Strategies for Engagement
The Government of The Bahamas	Sponsoring The Project	High	High	Can approve The Project; can act as internal and external "champion" of The Project. Withdrawing support/funding for project; stopping or pausing The Project.	Should be managed closely. Frequent communication.
Ministry of Energy and Transport	Approving The Project; Executing The Project	High	High	Can approve The Project; can act as internal and external champion of The Project	Should be managed closely. Frequent communication.

				Can withdraw support of The Project; or cause Project delays.	
Bahamas Power and Light	Facilitating The Project	High	High	Can facilitate The Project Can cause Project delays	Engaged as a core partner through regular strategy meetings, technical assessments, and capacity planning
Ministry of Tourism, Investments and Aviation	Ensure The Project supports sustainable tourism goals, and aligns with national tourism strategy	High	Medium	Can delay or withdraw support if The Project negatively impacts tourism revenue	Frequent communication

Department of Environmental Planning & Protection (DEPP)	Approving The Project	High	High	Can approve The Project Can stop or pause The Project, causing project delays	Should be managed closely. Frequent communication.
Other Government Agencies/	Facilitating The Project	Medium	Medium	Can facilitate The Project	Should be kept informed of The Project
Utility Corporations/ Municipal Authorities	Provision of utilities			Can cause project delays	Progress, changes, and risks
Project Team (Contractor, Project Manager, etc.)	Manages The Project. Responsible for The Project's technical, administrative, and operational	High	High	Positive: Meet project objectives Negative: Project delays	Should be managed closely. Frequent Communication.

	management, etc.				
NGOs, Community Groups, Neighboring Communities		High	Low	Show public support for The Project. Public opposition to The Project	Should be kept informed of project progress Organize meetings and awareness events Should mitigate any negative stakeholder actions

8.2.1.1 Method of Engagement

There are a variety of engagement techniques used to build relationships with stakeholders, gather information from stakeholders, consult with stakeholders, and disseminate project information to stakeholders. Engagement will be conducted in a variety of ways in a manner that is accessible and culturally appropriate.

The following criteria should be taken into consideration in determining the appropriate and most effective form of communication to be used for a stakeholder:

- Stakeholder proximity to The Project.
- Number of persons impacted.
- Degree of impact (positive or negative).
- Significance of impact.
- Extent of stakeholder influence on The Project
- Purpose of engagement.
- Audience to be addressed.

The following methods will be used to consult with stakeholders:

- Surveys.
- Phone calls, emails, text, and WhatsApp messages.
- Print media, social media, and radio announcements.
- One-on-one Interviews.
- Focus Groups.
- Workshops.
- Public Consultations.

8.3 Public Consultation

Public Consultation is critical to ensure proper stakeholder engagement. Public Consultation with relevant stakeholders is important in helping decision-makers understand the views, values, interests, issues, and concerns held by the community regarding the proposed development and incorporate them into decisions. The public consultation outlines the EIA and presents the Project's purpose, objective, scope of works, baseline data, and monitoring program, and outlines the possible impact and mitigation measures. The meeting should be in a public location during a designated time and include stakeholders such as tourists, surrounding businesses, nearby residents, relevant Government Agencies, Non-Governmental Agencies, and any other groups mentioned above.

Once the logistics of the meeting are determined, the general public should be made aware of when and where the meeting is occurring. Ads should be placed in media sources such as the newspaper, on television, on the radio, and on social media platforms at least fourteen (14) days in advance.

During the meeting, minutes should be taken, and an email should be provided where stakeholders can submit their comments, questions, and concerns regarding The Project. The Project should incorporate the answers to these comments and concerns in the final draft of the EIA.

9.0 Conclusion

The Project area in New Providence encompasses a route that lies within a heavily human-altered ecological zone dominated by urban development, road networks, and industrial infrastructure. This area has undergone extensive transformation due to past and ongoing construction activities, leaving little to no intact natural habitats. Consequently, the biodiversity in this zone is low, with native flora and fauna displaced or restricted to isolated pockets.

The Environmental Impact Assessment (EIA) for the LNG plant and submarine power transmission cable project from Arawak Cay to the Nassau Cruise Port underscores a commitment to sustainable development, environmental stewardship, and community well-being. The Project aims to minimize its ecological footprint while enhancing critical infrastructure for New Providence by addressing key environmental considerations, implementing robust mitigation measures, and ensuring rigorous monitoring.

10.0 References

Areces-Mallea, A. E., Weakley, A. S., Li, X., Sayre, R. G., Parrish, J. D., Tipton, C. V., & Boucher, T. (1999). A Guide to Caribbean Vegetation Types: Preliminary Classification System and Descriptions. The Nature Conservancy.

Bahamas, T. G. (2021). Forestry (Declaration of Protected Trees) Order 2021. Nassau: The Government of The Bahamas.

Charpin, F. (n.d.). Caribbean reefs. Caribbean Reefs - Angelfishes - Surgeonfishes - Butterflyfishes. Retrieved February 7, 2023, from https://reefguide.org/carib/index1.html

Correll, D., & Correll, H. (1982). The Flora of the Bahama Archipelago: Including Turks & Caicos Islands. J. Cramer.

Currie, D., Wunderle, J. M., Fried, E., Ewert, D. N., & Lodge, D. J. (2019). The Natural History of The Bahamas: A field guide. Cornell University Press.

Charpin, F. (n.d.). Caribbean reefs. Caribbean Reefs - Angelfishes - Surgeonfishes -Butterflyfishes. Retrieved September 23, 2025, from https://reefguide.org/carib/index1.html

Humann, P. Deloach, N. (2014). Reef Fish Identification: Florida, Caribbean, Bahamas (4th ed.). New World Publications

Humann, P. Deloach, N. (2013). Reef Coral Identification: Florida, Caribbean, Bahamas (3rd ed.). New World Publications.

Humann, P. Deloach, N. (2013). Reef Creature Identification: Florida, Caribbean, Bahamas (3rd ed.). New World Publication.

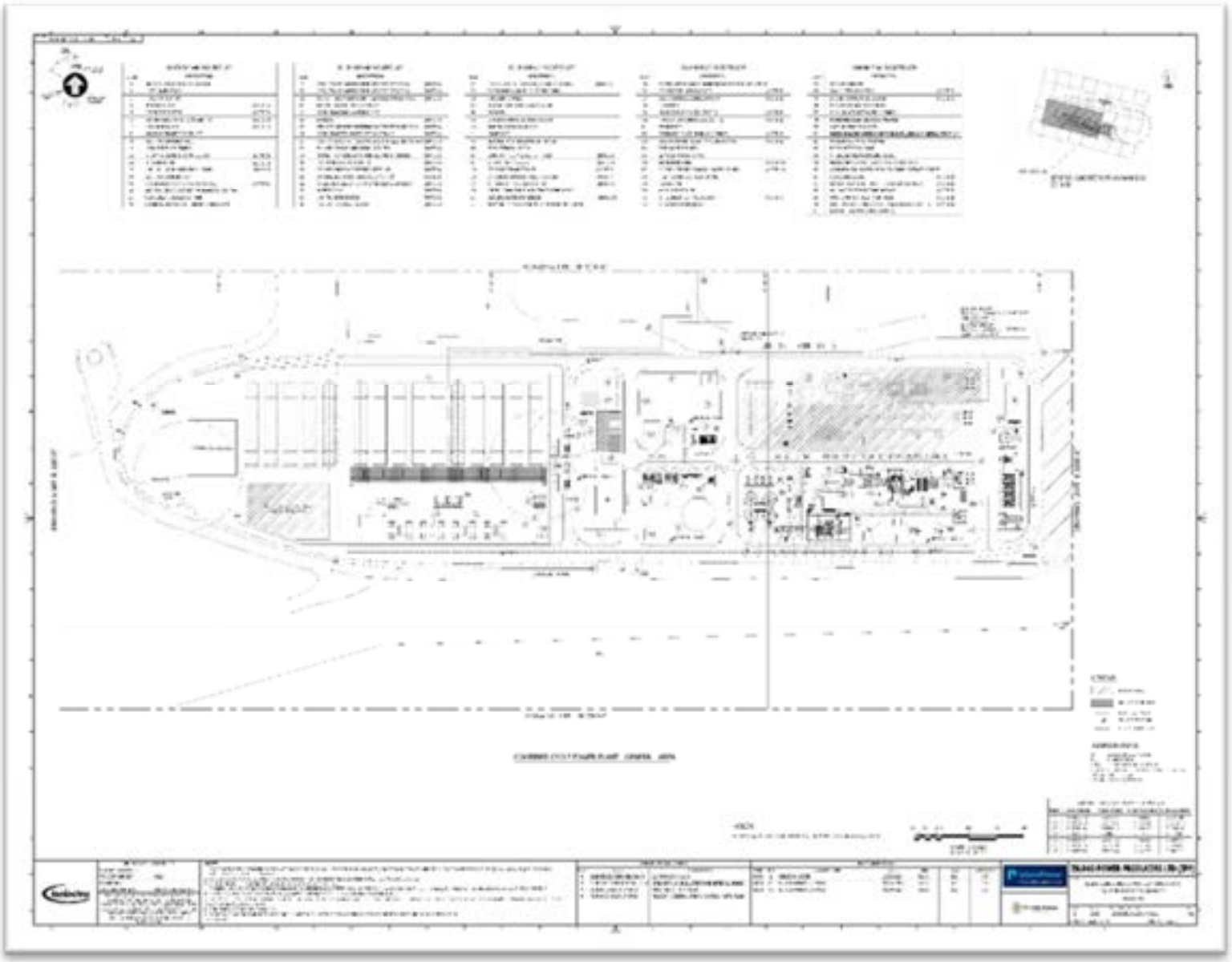
Ministry of the Environment. (2021). Forestry (Declaration of Protected Trees) Order 2021. Nassau: The Government of The Bahamas.

Moultrie, S. (2013). The Bahamas Invasive Species Strategy 2013. Nassau: Department of Marine Resource

United States Environmental Protection Agency. (2025) Power Plants and Neighboring Communities. Retrieved September 22, 2025, from https://www.epa.gov/power-sector/power-plants-and-neighboring-communities

Appendices

Appendix A: Site Plan



Appendix B: Hydrological and Eco-Hydrological Assessment

ADARIE ENGINEERING AND ENVIRONMENTAL SERVICES

ARAWAK CAY LNG FACILITY

@ New Providence Offshore Man-made Cay

GROUNDWATER | COASTAL | WETLAND | ENVIRONMENTAL

RAPID HYDROLOGICAL-ECOHYDROLOGICAL ASSESSMENT

October 1, 2025

PROJECT OVERVIEW

The rapid assessment aims to identify the potential hydrological impact to the island and surrounding coastal zone, either due to the natural (climatic) | construction (grading & development) effects | operation of the completed Arawak Cay Liquified Natural Gas (LNG) Generation Facility.

Other environmental protection and mitigation measures were also detailed, per guidance of typical Environmental Impact Assessment | Environmental Management Plan (EIA/EMP). **All site plans and maps to be referenced within the EIA/EMP documents.**

A brief hydrogeological | water resources review was conducted to evaluate information & data achieves, assess the limits of the freshwater lens, note the existing hydro-geological features, and to determine influences between the landform and the marine environment.

BAHAMAS WATER RESOURCES

For The Bahamas, all freshwater is by way of rainfall, which percolates and collects as groundwater. The general movement of the groundwater is toward the coastline (typically during a falling tide), with very gradual movement inland (during rising tide conditions).

Salinity levels of water are expressed in parts per million (ppm) or milligrams per litre (mg/l) of the chloride content in the water, which is a constituent of the total dissolved solids. The total concentration of dissolved solids or salts (TDS, expressed in mg/L or ppm) is utilized as a water quality indicator.

The three main classes of water distinguished are: fresh, brackish and saline (salt | saline) water. For the purposes of the particular site(s), the conservative range of salinity follows:

Water Description	Dissolved Solids
Fresh	Less than 1,000-mg/l
Brackish	1,000 – 3,000-mg/l
Salt	More than 3,000-mg/l
Saline	More than 30,000-mg/l

WETLAND LOCATIONS IN THE BAHAMAS

Topographically, the islands of The Bahamas are typically flat with elevations of less than ten meters (32-feet). As a result; they are essentially dominated by wetland ecosystems, the majority comprising of shallow brackish to saline lagoons, mangrove swamps, coastal flats and inter-tidal sand and mudflats. The wetlands vegetation throughout The Bahamas consists of four species of mangroves; red, white, black and button wood. The quantity, quality and location of these species are dependent on their regional position within the country, average rainfall or direct access to the open ocean and the stage of development of the mangrove system. (The Layman's Guide to Wetlands in The Bahamas, BEST Commission, 2007)

MANGROVE VEGETATION - WATER QUALITY CHARACTERISTICS

The land transition area from upper hard surface/zone (where the fresh groundwater lens may exist below), to the coastal zone (the marine/sea environment) is characterized by the existence of mangrove vegetation. Mangrove vegetation is typically found in tropical and subtropical regions where the water is warm and the salinity is relatively high. The species of mangrove typically survive by filtering out as much as 90-percent of the salt found in the seawater, as it enters their roots. 'In general, mangrove plants grow optimally between the 5–20 ppt salinity range, while the majority of plants can survive under a salinity level of 35 ppt' (Patel et al., 2010; Wang et al., 2011; Kodikara et al., 2017). Note: 1ppm = 10^6ppt

Three species of tropical wetland trees grow along the soft-sandy shoreline of The Bahamas are classified as mangroves. These three species are native to Florida & The Bahamas: Red mangrove (Rhizophora mangle), Black mangrove (Avicennia germinans) and White mangrove (Laguncularia racemosa).

The hard ground species of mangrove is the Buttonwood (Conocarpus erectus), or button mangrove; a hardy species of mangrove shrub in the family Combretaceae. Buttonwood is typically found on the edges of salt flats, rock-lands, or the borders of fresh & brackish water marshes.

CLIMATE RESILIENCE | SEA LEVEL RISE + STORM SURGE - PREDICTIONS

A significant rise in the tidal level is possible | expected due to climate change for the entire Commonwealth of The Bahamas, but not detailed within this hydrological report.

In the general vicinity of the island of New Providence, the tides are semi-diurnal with an average range of 2.46-Ft (0.75 meters) and a tidal period of approximately 12.4-hours. The anticipated Mean High-Water Spring (MHWS) Tide is +1.30-Ft (+0.40-m), and Mean Low-Water Spring (MLWS) Tide is -1.64-Ft (-0.50-m), for New Providence.

The consideration for future predicted elevated tidal levels must be factored into the design height of the proposed new structures on Arawak Cay.

Per previous 'AEES Tidal Gauge Assessments' and guidance; measurements between the existing structure for varied tidal conditions were noted. Area tidal conditions may be used as a basis to predict the future flooding potential. All data being reviewed, for correlation to New Providence (per LPIA rainfall records) and fixed NOAA Water Level Gauges (@ Eastern Florida Coast & FL Cays).

ARAWAK CAY SITE - GEOLOGIC CONDITIONS

Arawak Cay is a sheet piled / concrete bulkhead 'man-made island' (Cay) off the Northern Coast of New Providence, The Bahamas. It was intentionally constructed from the dredging material of the Nassau Harbour Construction in 1969, and shipping operations (commercial and water barge services) commenced in the 1980s. During 2011, the Nassau Container Port was built on Arawak Cay (to the Northeast Section). The Arawak Cay Area is protected to the North by Silver Cay (natural offshore Cay), and a West – East placed breakwater section (for surge defense).

The expected depth to the natural hard floor of limestone rock geology is approximately 20 to 25-Ft.

Flooding due to excessive rainfall, or during the passage of Tropical Storms may be a concern for this low-lying area, and thru the channels, where the constructed bridges connect the Cay to New Providence from the South | Silver Cay to the North.

ARAWAK CAY SITE - COASTAL WATER QUALITY SAMPLES

Most recently (during Sept-2024) a coastal water sample was collected for chemical analysis – at the North bridge site location that connects Arawak Cay to Silver Cay. The results are presented in Table 1 below (by AEES, from 18-Sept-2024).

All samples taken from the coastal zone (1Ft to 2Ft below water surface), along the North shoreline of Arawak Cay.

Additional | more advance (Chemical | Microbiological | Organic) may be required during the construction activities of the LNG Power Facility. It is expected that the required protective measures shall be in place prior to construction activities of the structure & for the duration of the construction.

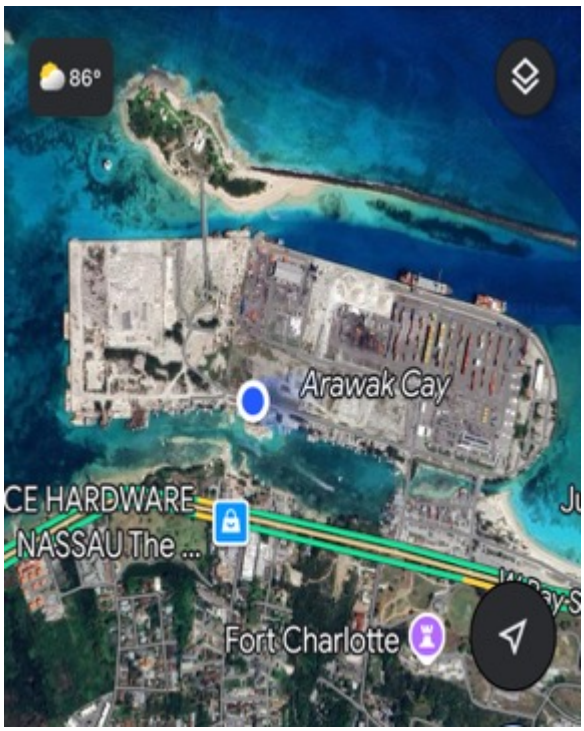
FINDINGS – ARAWAK CAY SITE COASTAL WATER QUALITY

The nitrate content or influence from septic | sewerage is low at 1.0-mg/L. All water quality data indicates that the area is not influenced / affected by considerable nutrient loading. The water quality for the marine samples (for TDS, Salinity & Total Hardness) are outside the WHO standard for drinking water, but acceptable for aquatic life.

Due to the open water conditions, varied directional tidal flow, and the expected natural flush/exchange of water; the marine/coastal water results are appropriate for Coastal Marine Bathing, Contact Water Sports, & Commercial Fishing (per the guidance of EPA SW-II Class Water Quality Standards). Turbidity levels of 1.0-mg/L indicate clear water quality.

SITE VACINITY OBSERVATIONS – ARAWAK CAY, NEW PROVIDENCE

All existing primary bridge supports are into the marine environment – between Arawak Cay (man-made land form) and Silver Cay (off-shore Cay).



Arawak Cay Site


Looking North @ Silver Cay (South side)

Groundwater is non-existent on the Arawak Cay side. At the time of our visit (@ 9/00 on 18-Sept-2024), tide was at optimum height [just following a King Tide – Full Moon on 17-Sept-2024].

While no freshwater resources exist on Arawak Cay (or, the adjacent Silver Cay), due care must be taken to prevent unreasonable contamination to the surrounding marine resources; particularly during the construction phase at the LNG Generation Site.

Marine water conditions within the north channel were very good, during the 2024 Site Observations. A group of small squid (a rear sight for the Bahamian Marine Environment), witnessed between Silver & Arawak Cay on 18-Sept-2024.

TABLE 1: BETWEEN ARAWAK & SILVER CAY LABORATORY RESULTS – CHEMICAL

Laboratory Test	Silver Cay (SC), NP Between Arawak & SC Coastal Channel Sample	SW-II Coastal Regulatory Limits #
Chemical		
pH	7.90	6.5 to 8.5
Total Dissolved Solids – ppm [TDS]	32,800	
Sodium Chloride – ppm [Salinity]	12,600	
Total Hardness – ppm	1,197.7	
Apperance	Clear	Clear
Odor	None	None
Nitrate – ppm	1.0	
Turbidity – FNU	1.0	30

- SW-II Class Water Quality Standard – Coastal Marine for Bathing, Contact Water Sports, & Commercial Fishing

GENERAL ENVIRONMENTAL PROTECTION & MITIGATION MEASURES

This rapid assessment identifies the potential impacts due to the construction | operation of the proposed LNG Facility @ Arawak Cay – for groundwater | hydrology | water resources | water quality.

Present development plans are limited to the information provided in **the Appendices** – Proposed layout of structures on the Project Site, per Client [NTS]. The Project Concept in present form does not address any 'Potential Flood Hazard' for this area.

There is no expected offshore dredging / driving of structural piles in the marine zone, and/or coastline improvements associated with the construction of the LNG Facility.

Existing Area Environmental Hazards

Additional details shall be made available in the Project's Environmental Impact Assessment (EIA) | Environmental Management Plan (EMP).

Existing Water Resources (Groundwater where applicable) Use

Groundwater at site(s) is relatively brackish to salt (Salinity > 3,000-mg/L Chloride). For the purposes of this report; it is understood that alternative fresh/service water supplies are to be made available during construction and post construction, for the operation of the LNG Facility.

Potential Area Flood Hazard | Mapping - Predictions

The Lynden Pindling International Airport (LPIA) | Historical Rainfall Dataset for New Providence (NP) is the most reliable data for flood predictions in The Bahamas. According to the Bahamas Department of Meteorology, accumulated rainfall amounts of 1.5-inches (38.1-mm) within a 6-hour period, can result in significant flooding on the island of New Providence.

The average recorded rainfall is 54.33-Inches (1,380.2-mm) @ LPIA, with wettest month on average in June = 8.76-Inch (222.6-mm). The wettest 'Year on Record' @ LPIA is 1995: 76.33-Inches (1,938.8-mm), with wettest 3-month period on record (June to August 1997) = 37.03-Inch (940.6-mm). Source: https://rcc.cimh.edu.bb/files/2015/09/Bahamas-LPIA-Rainfall.pdf

Flooding due to excessive rainfall, and/or during the passage of Tropical Storms is always a concern for the near / adjacent coastal areas (on New Providence). Flooding for near shore project areas can be considered MODERATE – HIGH over the LONGTERM projections (per low land elevation, expected vulnerability to storm surge, & projected rainfall).

RECOMMENDATIONS

The hydrogeological & limited coastal survey involved the confirmation, status, and sustainability of any water resources | wetland features. The option of maintaining the existing surrounding environmental conditions is encouraged; where the proposed structures are built into the present conditions of the environment at Arawak Cay, with limited impact to the bulkhead structure / coastline.

Continued coastal water sample collection(s) is encouraged, to indicate that the area(s) are not influenced / affected by nutrient loading.

The following recommendations are made to minimize negative impacts to the resources:

- The water resources (and groundwater lens configuration) in the vicinity of the project site(s) can best be described as brackish to salt water. No freshwater resources exist on Arawak Cay, NP.
- The project area(s) are within designated coastal wetland | ephemeral wetland areas, so both the groundwater & surface water features of the wetlands are linked and functioning as a continuous hydrologic system.

- The completed structures are not expected to have an adverse impact to the water resources. Based on the projected land use (per the limited design plan review), the impact of the project on the groundwater resources is determined to be LOW | LONG TERM.
- Flooding due to excessive rainfall, and/or during the passage of Tropical Storms is a concern for the area, and the surrounding channels where the bridge structure(s) connect Arawak Cay (to New Providence @ South | Silver Cay @ North). The Lynden Pindling International Airport (LPIA) | Historical Rainfall Dataset for New Providence (NP) is best referenced for the same, to predict flood conditions within The Bahamas.
- Flooding due to extreme rainfall events | excessive surface runoff, along with storm surge can be deemed a concern for the project area(s) [MODERATE – HIGH | LONG TERM]. An optional mitigation mechanism for the potential flood hazard is to utilize retention lakes/ponds for storage of runoff flows and/or drainage wells, to alleviate potential flood conditions at the site & adjacent property sites; and also to prevent runoff to the marine zone.
- Per the Bahamas Department of Meteorology, accumulated rainfall amounts of 1.5-inches (38.1-mm) within a 6-hour period may result in significant flooding. The total depth of flooding is typically in order of 3 to 6-inches (76 to 152-mm) but the relief of flooding is assisted by the high permeability of the substratum. Certain areas that are low-lying may also be influenced by the tides and a rise in groundwater, due to the intensity of the rainfall. Tidal action induces an vertical movement to the groundwater table ranging from negligible amounts to about 3-feet (0.9-meters). The total elimination of the surface flooding is only achieved by the provision of surface water drainage systems and/or the increased elevation of road and property levels.
- Regarding drainage well structures for LNG Facility Site: modifications to the standard 150-foot drainage wells shall be utilized. Once sufficient hydraulic head is present to transfer flows down the well, effective drainage of the surface water is possible. The depth to the water table @ Arawak Cay is typically 2 to 3-Ft below ground level (BGL), and approximately 3 to 5-psi of hydraulic head is required for the flows down the cased well. The LNG Site / Facility is expected to be elevated, at minimum 2 to 3-Ft above the existing grade of the Arawak Cay Site. Sufficient hydraulic head should exist for natural drainage purposes, using 8 to 10-Inch well casing.
- Additional hydrological assessments shall be required for the varied phases of the development – to include any suggested retention pond design, and also any requirements for drainage structures (like under road pipe culverts, drainage swales & drainage well structures). Desalination (by Reverse Osmosis) is expected to be utilized for all required water services to the project.

REFERENCES

AEES Consulting Group, LLC Report(s) Tidal Gauge Hydrological Assessments within the Western District of New Providence (2023 thru 2024).

Cant, R.V. and Weech, P.S., 1986, A review of the factors affecting the development of Ghyben-Hertzberg Lenses in the Bahamas, Journal of Hydrology.

Cant, R.V., 1996, Water Supply & Sewerage in a Small Island Environment. "The Bahamian Experience" Small Islands: Marine Science and Sustainable Development. Coastal and Estuarine Studies.

Laymans's Guide to Wetlands in The Bahamas, BEST Commission (2007)

Martin H.C. and Weech P.S., Climate Change in the Bahamas – Evidence in the Meteorological Records (1999).

Sealey, Neil E. Bahamian Landscapes: An Introduction to the Geography of the Bahamas. Second Edition. Nassau, Bahamas: Media Publishing, 1994.

The National Oceanic and Atmospheric Administration (NOAA), National Weather Service (NWS), National Hurricane Center (NHC), North Atlantic Hurricanes (1851-2019) | Tides & Currents Water Level & Tide Predictions Data (2023 – 2025)

United States Army Corp's of Engineers (USACE) Water Resources Assessment of the Bahamas (2004).

Watson D., Relating Wellfield Lens Level to Shattuck Datum, UNDP Project BHA 150-2-001, Water Abstraction Transportation & Supply Project, October 1983.

Whitaker Fiona F. and Smart Peter L., Geology and Hydrogeology of Carbonate Islands, Developments in Sedimentology, "Chapter 4: Hydrogeology of the Bahamian Archipelago." Amsterdam, The Netherlands: Elsevier Science B.V., 1997.

APPENDICES

WATER QUALITY STANDARDS FOR COASTAL WATERS MARINE OUTFALLS

In a coastal segment marine water is subjected to several types of uses. Depending of the types of uses and activities, water quality criteria have been specified to determine its suitability for a particular purpose. Among the various types of uses there is one use that demands highest level of water quality/purity and that is termed a "designed best use" in that stretch of the coastal segment. Based on this, primary water quality criteria have been specified for following five designated best uses:

Class	Designated best use
SW-I (see Table 1.1)	Salt pans, Shell fishing, Mariculture and Ecologically Sensitive Zone.
SW-II (see Table 1.2)	Bathing, Contact Water Sports and Commercial fishing.
SW-III(see Table 1.3)	Industrial cooling, Recreation (non contact) and Aesthetics. I
SW-IV (see Table 1.4)	Harbour.
SW-V (see Table 1.5)	Navigation and Controlled Waste Disposal.

The standards along with rationale/remarks for various parameters, for different designated best uses, are given in Table 1.1 to 1.5.

Table 1.2
Primary Water Quality Criteria For Class SW-II Waters
(For Bathing, Contact Water Sports and Commercial Fishing)

S.No.	Parameter	Standards	Rationale/Remarks
1.	pH range	6.5-8.5	Range does not cause skin or eye irritation and is also conducive for propagation of aquatic life.
2.	Dissolved Oxygen	4.0 mg/l or 50 percent saturation value, which ever is higher.	Not less than 3.5 mg/l at any time of the year for protection of aquatic lives
3.	Colour and Odour	No noticeable colour or offensive odour.	Specially caused by chemical compounds like creosols, phenols, naptha, pyridine, benzene, toluene etc. causing visible colouration of salt crystal and tainting of fish flesh.
4.	Floating Matters	Nothing obnoxious or detrimental for use purpose.	None in concentration that would impair usages specially assigned to this class.
5.	Turbidity	30 NTU (Nephelo Tur- bidity Unit)	Measured at 0.9 depth..
6.	Fecal Coliform	100/100 ml (MPN)	The average value not exceeding 200/100 ml. in 20 percent of samples in the year and in 3 consecutive samples in monsoon months.
7.	Biochemical Oxygen Demand (BOD) (3 days at 27°C)	3 mg/l	Restricted for bathing (aesthetic quality of water). Also prescribed by IS:2296 1974..

Source: US EPA, 1986 [GSR 7, dated Dec. 22, 1998]

New Providence Island

Area: 80 mi^2 (1.5% of the total area)

Estimated Population (2000): 212,432 (69% of the total population)

Population Density: 2,655.4 people per square mile

Largest City: Nassau

Location: New Providence, the most densely populated island, is home to the capital city, Nassau. It is also one of the smallest Bahamian Islands. New Providence is 276 km (183 miles) southeast of Miami, Florida.

Surface Water

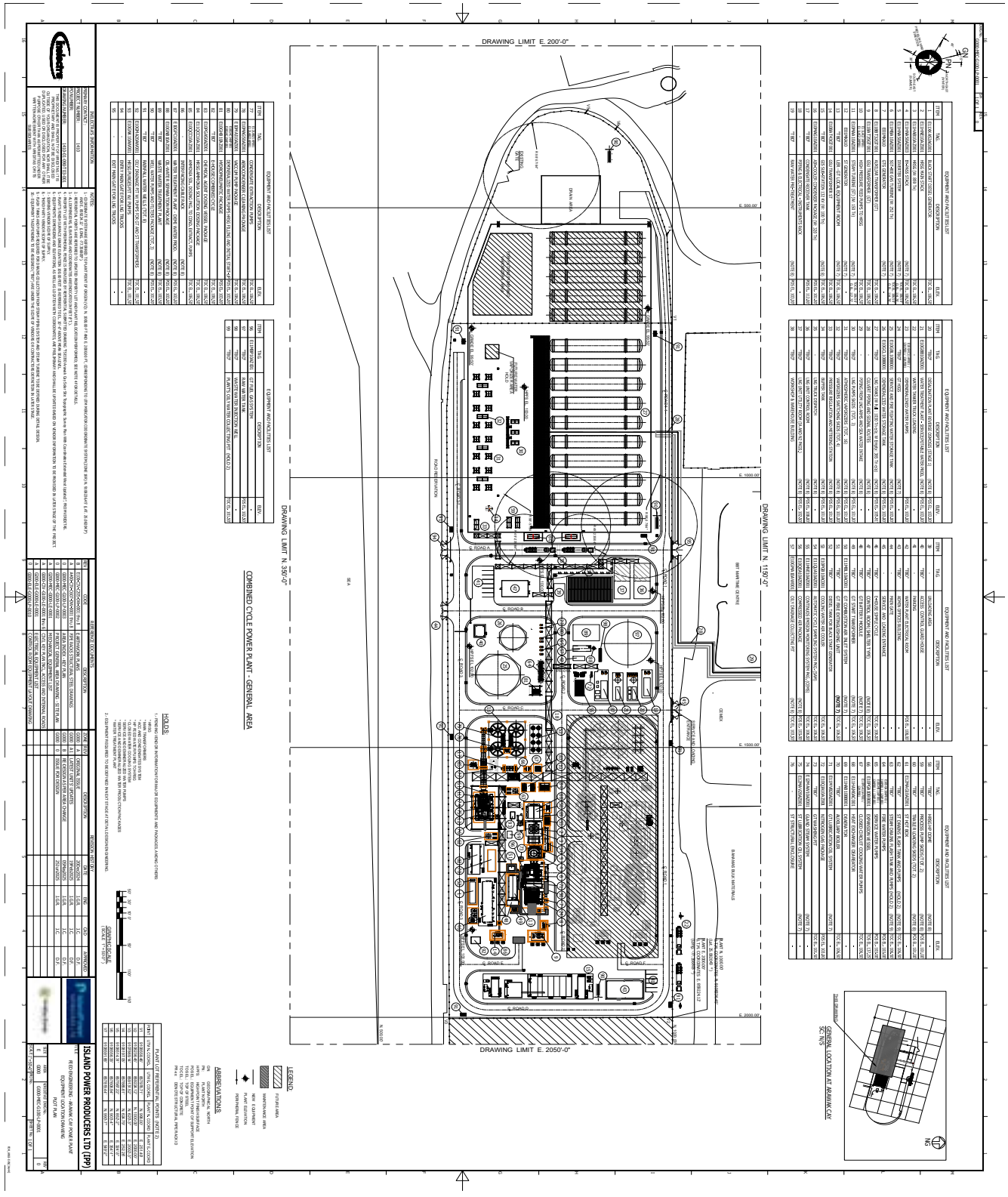
New Providence is one the wettest islands, receiving more than 130 cm (50 inches) of rainfall a year. The island's terrain is low and flat with a few small lakes and mangroves swamps. The southern coast of the island between Adelaide and Cay Point is dominated by lagoons and ponds (Map Unit 5). These areas are brackish or saline throughout the year. Lake Killarney, located in the center of New Providence, is surrounded by marshlands. The lake is quite shallow, only a meter or so deep, and is also brackish.[307] These features should not be considered sources of freshwater. Map Unit 5 accounts for 10% of the total area of the island. Surface water features may be polluted by industrial and urban runoff.

Ground Water

Given the high population density on New Providence, all ground water resources are being fully exploited, possibly over exploited, in order to provide water for the entire population. Wellfields are located throughout the island. Ground water is barged from North Andros Island to supplement the water supply on New Providence. Additional water is supplied by a Seawater RO Plant. Many hotels along the coast have installed their own RO systems in order to provide water for the many tourists that visit the island. Nearly three quarters of New Providence's public water supply is derived from North Andros and RO.[308]

Very small to meager quantities of water are available from the freshwater lenses of the limestone aquifer (Map Unit 2). The water table is within a meter or two of the surface and lens thickness varies across the island. Ground water is extracted via uncased boreholes and trenches. Ground water pollution is a concern on New Providence Island. Map Unit 2 accounts for nearly a quarter of the total area of the island. Areas (Map Unit 4) that are not underlain by limestone or sand aquifers are also unsuitable for ground water development and comprise 66% of the total island area. Industrial and urban runoff threaten the overall quality of the aquifer. The DEHS regularly monitors the public water supply.

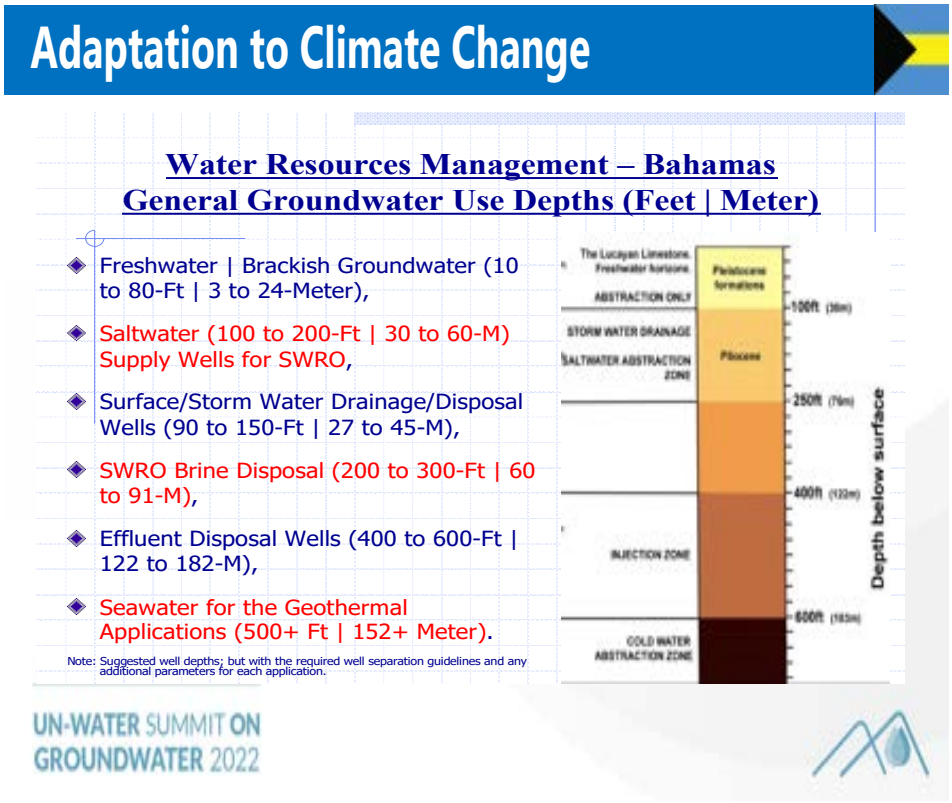
Ground water supplies on New Providence are currently being exploited to their maximum potential. Ground water exploration during military exercises is not recommended.



Source: Island Power Producers Ltd (2005)

ADARIE ENGINEERING AND ENVIRONMENTAL SERVICES

TYPICAL WELL DEPTH GUIDANCE FOR THE BAHAMAS



AEES Consulting Group, LLC
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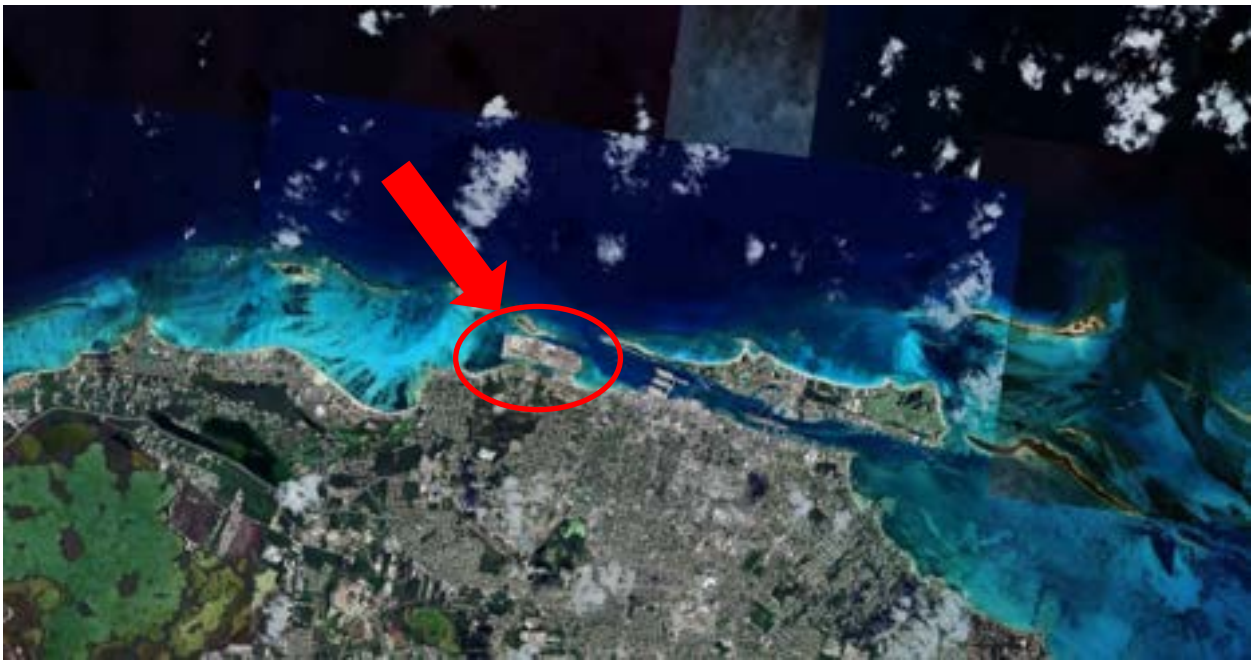
Appendix C: Geotechnical Studies

Island Power Limited

Arawak Cay

geotechnical report

nassau, bahamas



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January 2025

1.0 INTRODUCTION

1.1 General

This report presents the results of the subsurface investigation performed by Engineering and Technical Services, ETS, for the proposed power plant development at Arawak Cay, Nassau, Bahamas. Mr. Keith Bishop, Island By Design, engaged ETS to provide geotechnical information to assist with the following:

- Identification of various soil and/or rock profiles.
- Identification of groundwater levels.
- Recommendations of suitable foundation types and design parameters.

The scope of the subsurface investigation included site exploration and an evaluation of the samples recovered to determine appropriate foundation design and construction parameters. The site exploration was carried out between December 20, 2024, and January 9, 2025. This report contains a general description of the site subsurface conditions encountered and foundation design recommendations.

2.0 THE SITE

2.1 Location

The site is located on the southern side of Arawak Cay approximately 700 from the intersection of Arawak Cay Drive, the eastern entrance to Arawak Cay. The site is bounded to the east by vacant land, to the west by commercial development, to the north by the road reservation, and south by the Nassau Harbour waterway. Based on the groundwater elevations observed in the boring it is estimated that the existing grade elevation at the boring locations is approximately +10.0 MSL, see Figure 1.

Figure 1: Site Location

Proposed Development

Based on the information provided to us, it is our understanding that it is proposed to construct a new LNG power plant. It is anticipated that the structures will be constructed from concrete walls, concrete slabs, and prefabricated steel frames.

2.2 Geology

Generally, the Bahamas' geology consists of calcareous oolitic sands and/or porous calcareous sandy limestone which can be highly weathered in certain regions. The limestone in the Bahamas is irregularly cemented with local areas of coral composition between periods of sedimentation during changes in the sea level. The surface geology in west New Providence is predominately a mild karst-weathered limestone with minor cavities along and below the surface.

The site is on a man-made island that was constructed in the late 1960s. The island was created from the Nassau Harbour dredge spoil, see Figure 2.

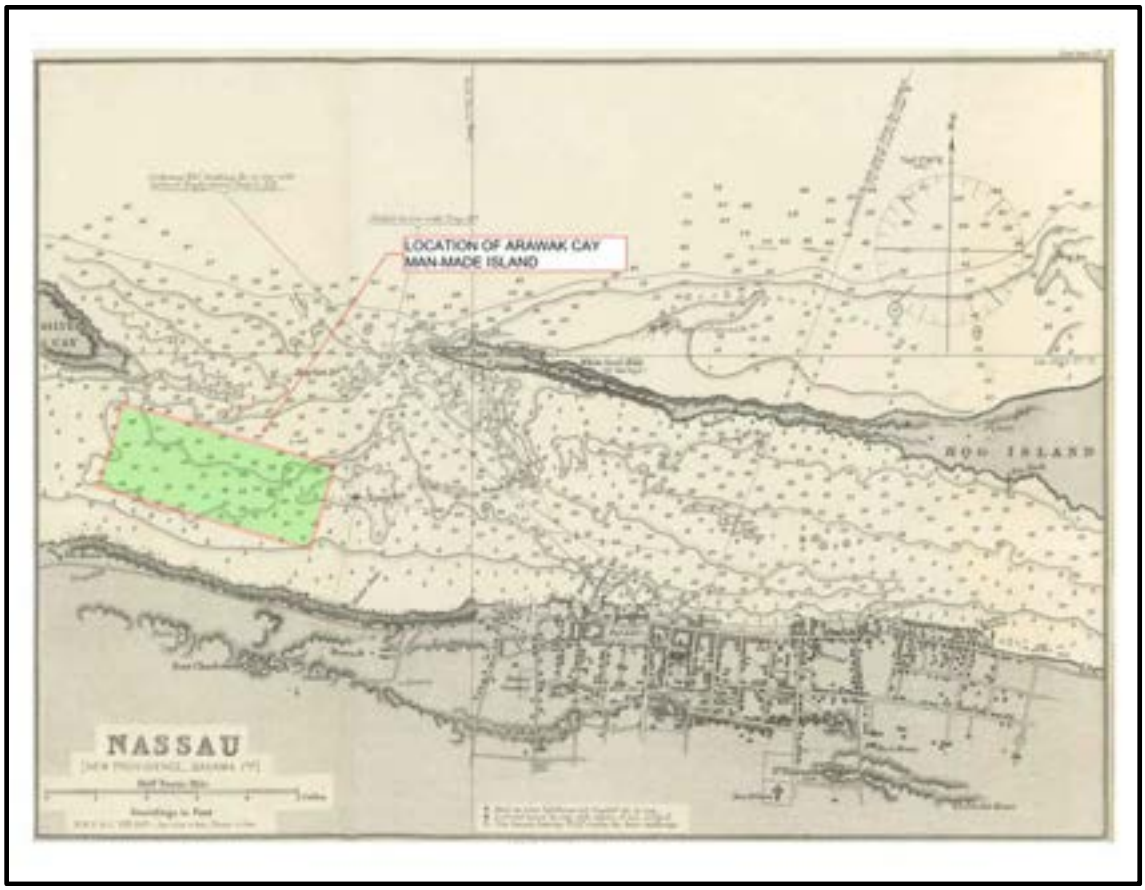


Figure 2: Site Pre-Arawak Cay Construction

3.0 SITE INVESTIGATION

The scope of the site investigation consists of completing seven (7) standard penetration boreholes to a depth of no less than thirty-five (35) feet below the existing grade and six (6) test pits. Soil samples were taken at two to five-foot intervals with a split barrel sampler driven with a manual 140-lb standard penetration hammer falling approximately 30 inches, in accordance with ASTM D-1586.

The blow counts required to drive the sampler represent the SPT N-value. The borings were carried out using a Simco 2800 drill rig. The approximate boring locations are indicated in Figure 3. Methods of drilling, sampling, and field conditions are indicated on the attached boring logs. Soil and core samples from the borings, and test pits, were re-examined in our office to confirm field classifications, and representative soil samples were selected for testing.

Figure 3: Boring Locations

3.1 Groundwater

Groundwater was encountered in each boring at approximately 9.0 feet below the existing grade. It should be noted that the groundwater observations only reflect the groundwater conditions at the time of our exploration. Fluctuations of the groundwater table should be expected to occur both seasonally and annually due to variations in rainfall, evaporation, construction activities, and other site-specific factors.

3.2 General Observations

Generally, the subsurface condition encountered consisted of an upper layer of compacted tan sandy limestone fill approximately 36 to 56 inches thick. The average blow count in this layer was 44 bpf, with a minimum value of 22 bpf and a maximum value of 95 bpf. Beneath the surface layer of fill, further sandy limestone fill was encountered extending to the groundwater depth of 9 to 10 feet below the surface. The average blow count in this layer was less than the upper layer of fill. The average blow count in this layer of fill was 27 bpf, with a minimum value of 3 bpf and a maximum value of 60 bpf. Thin layers of organics were observed within this layer of fill material. Generally, beneath the water table depth, a mixture of sand and limestone fill was encountered to a depth of 32 feet below the surface. The average blow count in this layer was 19 bpf, with a minimum value of 2 bpf and a maximum value of 73 bpf. Beneath this layer, a well-cemented limestone was encountered. The average blow count in this limestone was 60 bpf with poor-quality rock cores. Figure 4 illustrates a summary of the N-values, and our recommended design N-values to be used for the design of the foundations.

TEST PIT #5

TEST PIT #6

BORING B2

BORING B5

4.0 ANALYSIS

4.1 Shallow Foundations

The potential settlements of shallow footings were evaluated using the field boring data. The settlement analyses indicated that for footings that bear on the upper sandstone at a depth of no less than 4 feet below the existing grade, it is recommended that an allowable bearing pressure of 3,000 psf be utilized for designs. Figure 5 illustrates the recommended allowable bearing capacity relative to the footing depth. For uplift designs, it is recommended that a soil bulk density of 105 psf be used.

4.2 Deep Foundations

The buildings and equipment platforms may be supported on Augered Cast-In-Place Piles, (ACIP). ACIP piles are drilled into deep foundations in which the pile is installed to the required depth in one continuous process utilizing a continuous flight auger. Grout is then injected through, the hollow center of the auger pipe to the bottom of the shaft, under continuous positive pressure as the auger is withdrawn to exert positive upward pressure on the earth-filled auger flights as well as lateral pressure on the soil surrounding the placed grout or concrete column. Reinforcing steel is inserted into the column of fluid grout or concrete following the completion of grout or concrete placement. The structure is then founded on pile caps that are supported by the auger piles.

The load applied to the piles shall be transferred to the soil mainly through skin friction that develops along the sides of the piles. Sixteen (16), and twenty-for (24), inch diameter auger cast piles are commonly used in the region for structures; therefore, our analysis presented in this report is based on a 24-inch pile.

Figure 6.0 illustrates the recommended allowable capacity for a 24-inch auger cast pile relative to pile depth. The piles should be installed to a depth of no less than 35 feet below the existing grade to support an allowable compressive load of 250 kips and an allowable tension load of 150 kips.

Due to possible varying soil and limestone conditions, the actual pile tip elevations will be determined in the field based on the observations by the piling inspector and as agreed to by the Engineer.

It is recommended that rebar cages should be utilized in each pile. Steel bars or high-strength plastic wheel centralizers should be used to provide a minimum of 3-inch grout cover around the rebar cage or pipe and to keep the rebar cage or pipe centered. It is recommended that the centralizers be spaced at not less than 5-foot intervals. Concrete grout used in the auger cast piles should have a minimum design strength of 5000psi.

4.3 Foundation Recommendation

Based on our findings, it is our opinion that, from a geotechnical standpoint, the site is suitable for development.

Based on the anticipated loads, the construction advantages, and our experience with similar projects we recommend that ***24-inch diameter auger cast piles installed to 35 feet below the existing grade, to achieve an allowable compressive load of 250 kips per pile***, should be utilized to support the proposed structures.

4.4 Building Pad and Earthworks

The build areas should be prepared by removing and disposing of all surface vegetation, organic matter, and construction debris, including all roots, debris, stumps, rubbish, and other material that is considered unsuitable. After leveling and striping it is anticipated that only minor preparation under the building area is anticipated. The limits of the pad area for surface preparation should extend at least 5 feet beyond the edges of the building footings.

Imported clean, and organic-free, limestone fill should be used for all engineered fill material under the building's footprint. The fill soils must be tested to determine the maximum dry density and optimum moisture content determined by the Modified Proctor Test per ASTM D 1557.

The fill should be placed in layers not exceeding 8 inches in thickness before compaction. The total required depth of the imported fill must be determined from the final levels specified on the architectural drawings. The engineering fill may need to be conditioned with water to produce a suitable water content to optimize compaction. Fill shall be placed and compacted to at least 95% of the maximum Modified Proctor dry density and within 2 percentage points of the optimum moisture content. Density testing should be conducted and the results submitted to the geotechnical engineer for approval. The fill compaction should be checked with nuclear gauges or approved equipment with one test for every 2,000 square feet per lift in the building areas and 5,000 square feet per lift in the parking areas to ensure conformance with the recommended in-place density and moisture contents.

A subgrade modulus of 200 pounds per cubic inch (pci) for limestone-engineered fill is recommended for the structural design. Adequate construction joints should be provided to accommodate minimal differential movements.

Positive surface drainage away from the building, with proper stormwater collection, should be incorporated into the building design. Once this is done it is not anticipated that under slab, or perimeter drainage, will not be required because of the level.

4.5 Pavement Areas

The pavement areas should be sacrificed to a depth necessary to remove the observed organic material which is located 6 to 12 inches below the existing grade. Fill placed in the pavement area shall be conditioned with water and compacted to at least 98% of the maximum modified proctor dry density and within 2 percentage points of the optimum moisture content. It is recommended that a minimum thickness of 6 inches of compacted fill should be used for all pavement areas.

4.6 Slope Stability

Based on the side slopes observed during the test pits exploration, we do not anticipate slope stability issues at the project site. However, based on our experiences with similar projects and subsoil conditions, we recommend that excavated slopes should be designed no steeper than one (2) horizontal to one (1) vertical (2H:1V) for the site in situ sand.

Temporary shoring or retaining structures should not be required for the stabilization of the sides of the construction excavations for all 1H:1V or flatter slopes. Shoring may be required for all 1H:1V or steeper. During construction, temporary surface protection should be installed at the top of all high slopes.

5.0 Lateral Design Parameters

For site structures, such as possible retaining walls, equipment pads, and small structures, that bear on the limestone, the suggested design parameters are as follows:

Soil Density: 95pcf
Internal Angle of Friction: 27 degs.
Active condition: Ka = 0.37
At rest condition: Ko = 0.54
Passive condition: Kp = 2.66
Cohesion: 0
Allowable Bearing Capacity: 3,000psf
Coefficient of friction for the foundation: 0.40.

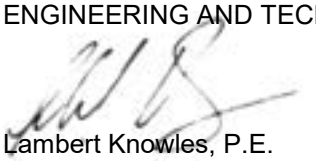
6.0 Limitations and Uniformity of Conditions

The undersigned should be notified at least two days prior to site grading and piling commencing and should be present to observe pile installation on site. The recommendations in this report are based on the observed soil conditions encountered at the place, and time, of the investigation only. Any recommendations given are based on these observations; however, soil conditions encountered during construction may differ significantly from those reported. If so we should be contacted to provide supplemental recommendations. It is the owner's responsibility to ensure that the information and recommendations contained in this report are brought to the attention of the architect, structural engineer, and contractor for the proposed project.

We appreciate the opportunity to be of service in preparing this report. If you have any questions on the above or require additional assistance, please do not hesitate to contact the undersigned.

Sincerely,

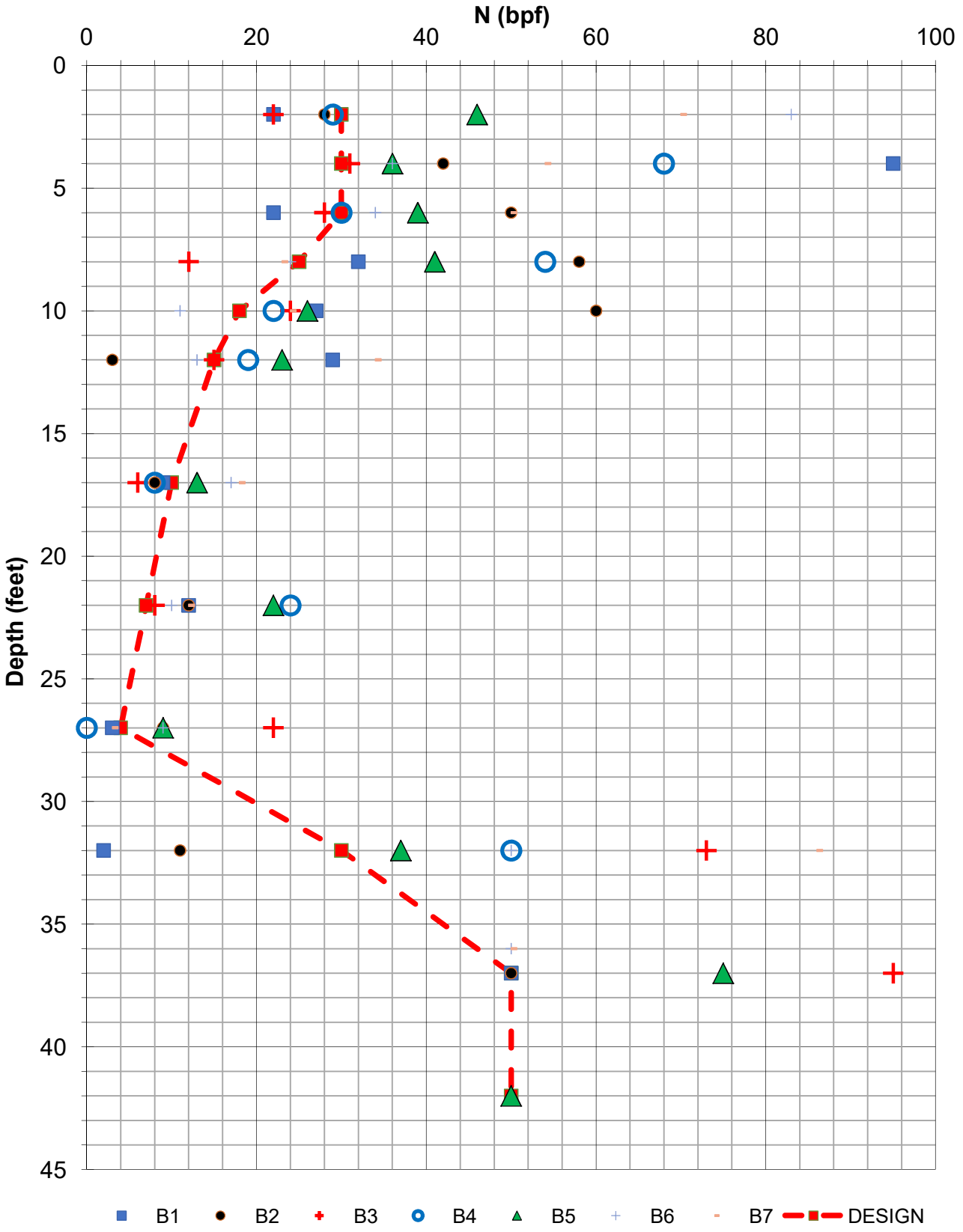
ENGINEERING AND TECHNICAL SERVICES



Lambert Knowles, P.E.
Principal

FIGURES

FIGURE 4: ISLAND POWER
Summary of Resistance Readings



ISLAND POWER
ARAWAK CAY, NASSAU
FIGURE 5.0
ALLOWABLE BEARING PRESSURE

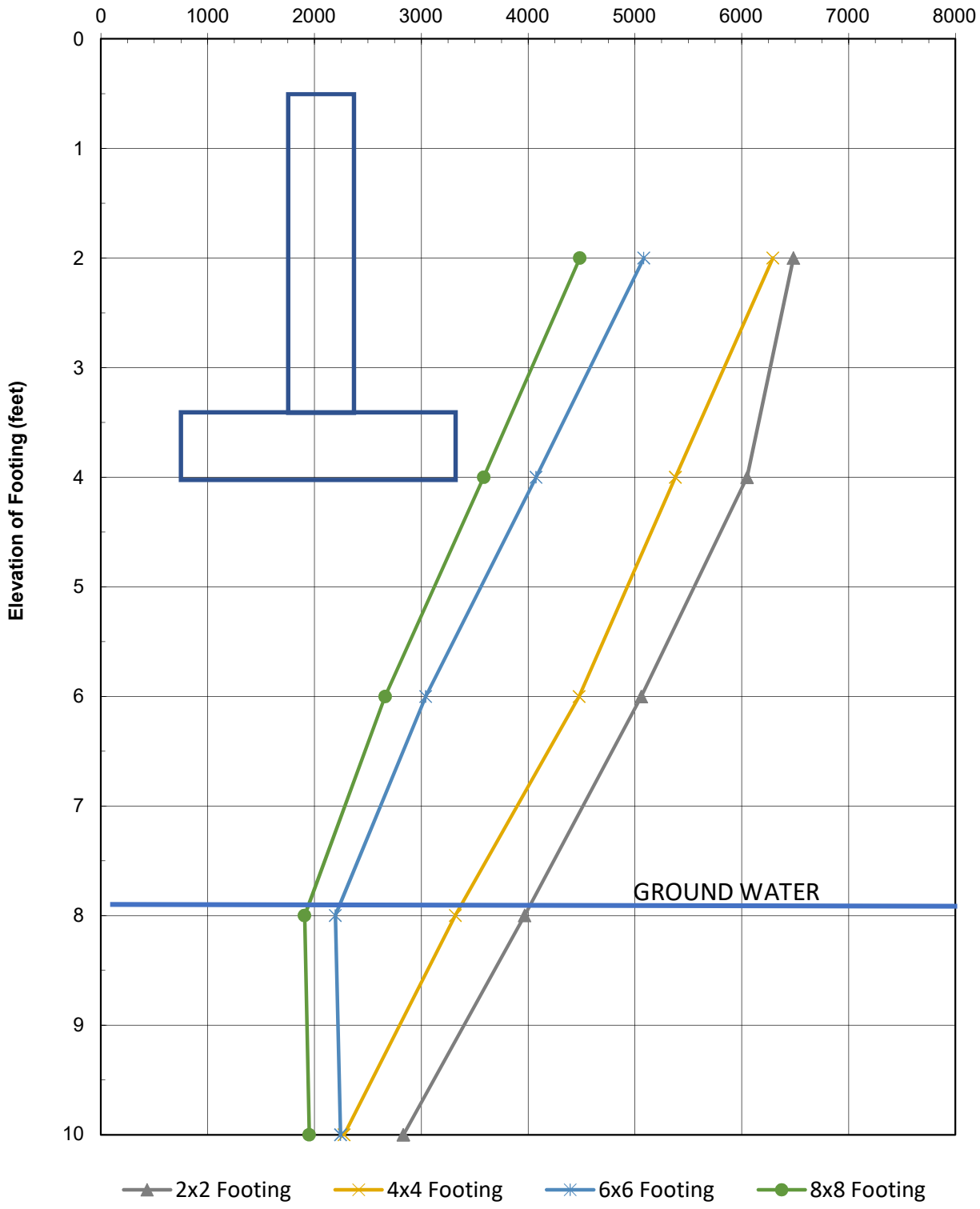
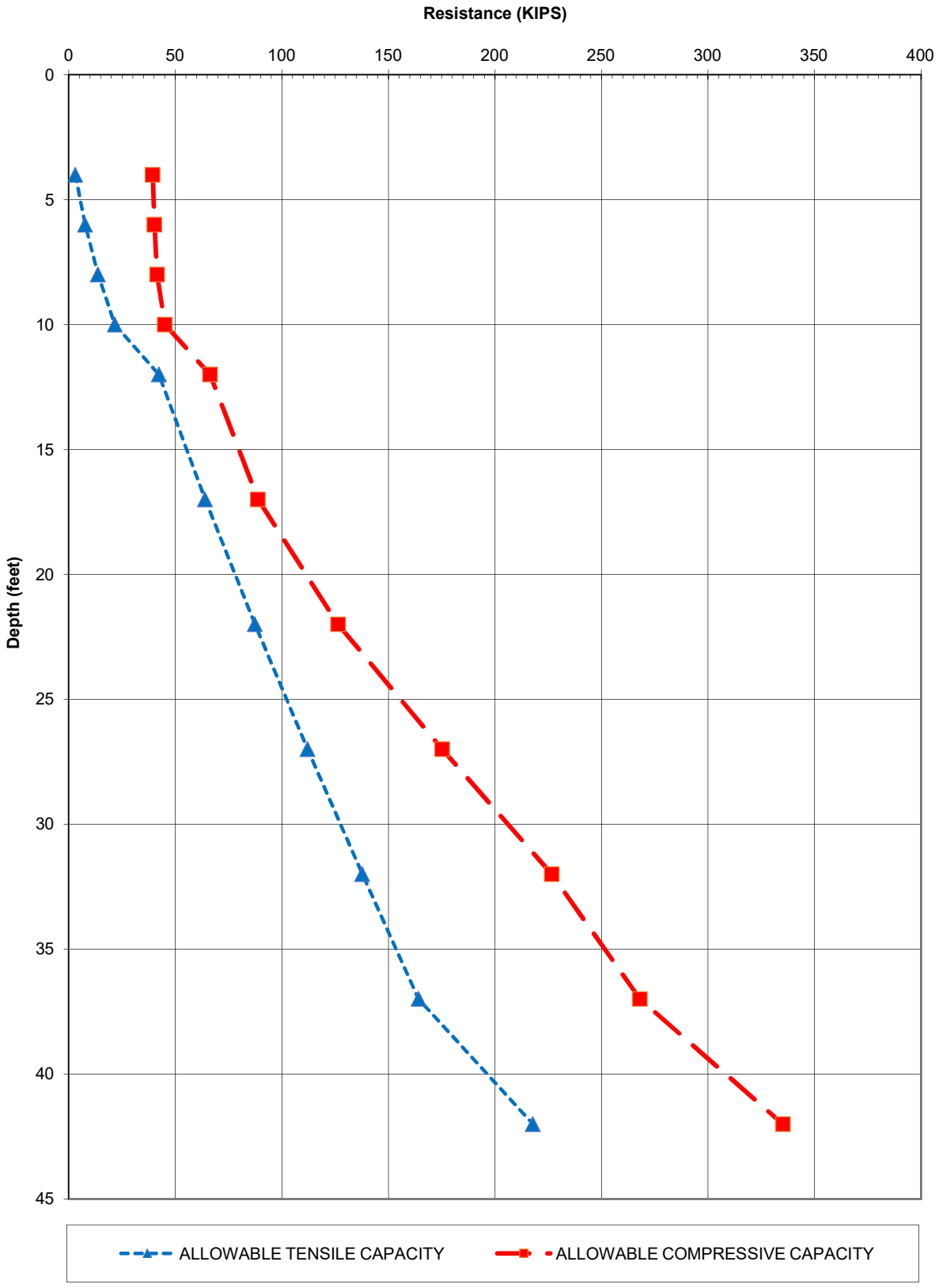


FIGURE 6.0 - ISLAND POWER
24- INCH AUGER CAST PILE
ESTIMATE ALLOWABLE LOAD CAPACITY
5000psi Concrete



BORING LOGS

BORING / SAMPLE LOG

BORING #: B1

ENGINEERING AND TECHNICAL SERVICES P.O. BOX SS 5589 NASSAU, BAHAMAS	**PROJECT:**	ISLAND POWER	**SHEET:** 1
	LOCATION:	ARAWAK CAY Nassau, Bahamas	**OF:** 1

DRILLING CO:	ETS	**START DATE:**	12/23/2024	**CASING:** 3.5' HAS	**COORDINATES:**		
DRILLER:	Thomas	**WATER DEPTH**	9	**SAMPLER:** 2" SS-SPT			
ENGINEER:	LK	**HAMMER WT:**	140	**CORE BARREL:**			
Drill Rig:		**FALL:**	30	**SEABED ELEV:**			

BORING RECORD

Depth (ft)	Sample No.	Depth Range (feet)	Samp. Type	0-12 0-6	12-24 6-12	24-36 12-18	36-48 18-24	48-60 N/A	Pen. (inch)	Rec. (inch)	RQD (%)	SPT "N" / UCS	FIELD DESCRIPTION AND REMARKS
2	1	0.0-2.0	SS	7	8	14	9	N/A	24	13	N/A	22	TOP SOIL AND IMPORTED FILL
4	2	2.0-4.0	SS	14	45	50		N/A	20	8	N/A	95	TAN SANDY LIMESTONE FILL
6	3	4.0-6.0	SS	9	12	10	16	N/A	24	12	N/A	22	TAN SANDY LIMESTONE FILL
8	4	6.0-8.0	SS	14	15	17	15	N/A	24	10	N/A	32	TAN SANDY LIMESTONE FILL
10	5	8.0-10.0	SS	17	13	14	14	N/A	24	14	N/A	27	TAN SANDY LIMESTONE FILL
12	6	10.0-12.0	SS	15	13	16	14	N/A	24	12	N/A	29	TAN SANDY LIMESTONE FILL
17	7	15.0-17.0	SS	5	4	5	4	N/A	24	12	N/A	9	TAN SILTY LIMESTONE FILL
22	8	20.0-22.0	SS	6	6	6	14	N/A	24	24	N/A	12	TAN SILTY LIMESTONE FILL
27	9	25.0-27.0	SS	1	2	1	2	N/A	24	26	N/A	3	TAN SILTY LIMESTONE FILL
32	10	30.0-32.0	SS	1	1	1	1	N/A	24	16	N/A	2	TAN SILTY LIMESTONE FILL
37	11	35.0-37.0	SS	REFUSAL				N/A	0	0	N/A	50	WELL CEMENTED LIMESTONE
42	12	35.0-37.0	RC					N/A	60	45	N/A		WELL CEMENTED LIMESTONE

Proportions Used: trace = < 5%, few = 5-10%, little = 15-25%, some = 30-45%, and = 50-100%

Notes:

ENGINEER

BORING / SAMPLE LOG

BORING #: B2

	ENGINEERING AND TECHNICAL SERVICES **P.O. BOX SS 5589** **NASSAU, BAHAMAS**	**PROJECT:**	ISLAND POWER	**SHEET:**	1
		LOCATION:	ARAWAK CAY Nassau, Bahamas	**OF:**	1

DRILLING CO:	ETS	**START DATE:**	12/24/2024	**CASING:** 3.5' HAS	**COORDINATES:**	
DRILLER:	Thomas	**WATER DEPTH**	10	**SAMPLER:** 2" SS-SPT		
ENGINEER:	LK	**HAMMER WT:**	140	**CORE BARREL:**		
Drill Rig:		**FALL:**	30	**SEABED ELEV:**		

BORING RECORD

Depth (ft)	Sample No.	Depth Range (feet)	Samp. Type	0-12 0-6	12-24 6-12	24-36 12-18	36-48 18-24	48-60 N/A	Pen. (inch)	Rec. (inch)	RQD (%)	SPT "N" / UCS	FIELD DESCRIPTION AND REMARKS
2	1	0.0-2.0	SS	10	14	14	18	N/A	24	15	N/A	28	TOP SOIL AND IMPORTED FILL
4	2	2.0-4.0	SS	14	20	22	40	N/A	24	24	N/A	42	SANDY LIMESTONE FILL
6	3	4.0-6.0	SS	40	50			N/A	10	8	N/A	50	SANDY LIMESTONE FILL
8	4	6.0-8.0	SS	35	27	31	30	N/A	24	18	N/A	58	SAND AND SANDY LIMESTONE FILL
10	5	8.0-10.0	SS	27	29	31	35	N/A	24	24	N/A	60	SAND AND SANDY LIMESTONE FILL
12	6	10.0-12.0	SS	4	1	2	14	N/A	24	16	N/A	3	SAND AND SANDY LIMESTONE FILL
17	7	15.0-17.0	SS	3	5	3	4	N/A	24	10	N/A	8	COARSE SAND
22	8	20.0-22.0	SS	5	7	5	7	N/A	24	23	N/A	12	SAND AND SANDY LIMESTONE
27	9	25.0-27.0	SS	7	5	4	7	N/A	24	24	N/A	9	COARSE SAND
32	10	30.0-32.0	SS	4	5	6	8	N/A	24	24	N/A	11	SAND AND SANDY LIMESTONE
37	11	35.0-37.0	RC					N/A	60	54	N/A	50	WELL CEMENTED LIMEROCK

Proportions Used: trace = < 5%, few = 5-10%, little = 15-25%, some = 30-45%, and = 50-100%

Notes:

ENGINEER

BORING / SAMPLE LOG

BORING #: B3

ENGINEERING AND TECHNICAL SERVICES P.O. BOX SS 5589 NASSAU, BAHAMAS	**PROJECT:**	ISLAND POWER	**SHEET:**	1
	LOCATION:	ARAWAK CAY Nassau, Bahamas	**OF:**	1

DRILLING CO:	ETS	**START DATE:**	12/27/2024	**CASING:** 3.5' HAS	**COORDINATES:**	
DRILLER:	Thomas	**WATER DEPTH**	N/A	**SAMPLER:** 2" SS-SPT		
ENGINEER:	LK	**HAMMER WT:**	140	**CORE BARREL:**		
Drill Rig:		**FALL:**	30	**SEABED ELEV:**		

BORING RECORD

Depth (ft)	Sample No.	Depth Range (feet)	Samp. Type	0-12 0-6	12-24 6-12	24-36 12-18	36-48 18-24	48-60 N/A	Pen. (inch)	Rec. (inch)	RQD (%)	SPT "N" / UCS	FIELD DESCRIPTION AND REMARKS
2	1	0.0-2.0	SS	15	13	9	14	N/A	24	15	N/A	22	SANDY LIMESTONE FILL
4	2	2.0-4.0	SS	18	18	13	14	N/A	24	20	N/A	31	SANDY LIMESTONE FILL
6	3	4.0-6.0	SS	14	14	14	12	N/A	24	18	N/A	28	TOP SOIL AND SANDY LIMESTONE FILL
8	4	6.0-8.0	SS	8	6	6	5	N/A	24	20	N/A	12	SANDY LIMESTONE FILL
10	5	8.0-10.0	SS	13	13	11	12	N/A	24	15	N/A	24	SANDY LIMESTONE FILL
12	6	10.0-12.0	SS	11	11	4	4	N/A	24	18	N/A	15	SANDY LIMESTONE FILL
17	7	15.0-17.0	SS	7	3	3	4	N/A	24	11	N/A	6	COARSE SAND AND SANDY LIMESTONE
22	8	20.0-22.0	SS	4	5	3	6	N/A	24	10	N/A	8	SAND AND SANDY LIMESTONE
27	9	25.0-27.0	SS	15	13	9	14	N/A	24	18	N/A	22	COARSE SAND AND SANDY LIMESTONE
32	10	30.0-32.0	SS	32	29	44	47	N/A	24	15	N/A	73	SANDY LIMESTONE
37	11	35.0-37.0	SS	42	45	50		N/A	15	5	N/A	95	WELL CEMENTED LIMEROCK
40	12	40.0-42.0	SS	REFUSAL				N/A			N/A		CEMENTED LIMEROCK

Proportions Used: trace = < 5%, few = 5-10%, little = 15-25%, some = 30-45%, and = 50-100%

Notes:

ENGINEER

BORING / SAMPLE LOG

BORING #: B4

ENGINEERING AND TECHNICAL SERVICES P.O. BOX SS 5589 NASSAU, BAHAMAS	**PROJECT:**	ISLAND POWER	**SHEET:**	1
	LOCATION:	ARAWAK CAY Nassau, Bahamas	**OF:**	1

DRILLING CO:	ETS	**START DATE:**	12/28/2024	**CASING:** 3.5' HAS	**COORDINATES:**	
DRILLER:	Thomas	**WATER DEPTH**	10	**SAMPLER:** 2" SS-SPT		
ENGINEER:	LK	**HAMMER WT:**	140	**CORE BARREL:**		
Drill Rig:		**FALL:**	30	**SEABED ELEV:**		

BORING RECORD

Depth (ft)	Sample No.	Depth Range (feet)	Samp. Type	0-12 0-6	12-24 6-12	24-36 12-18	36-48 18-24	48-60 N/A	Pen. (inch)	Rec. (inch)	RQD (%)	SPT "N" / UCS	FIELD DESCRIPTION AND REMARKS
2	1	0.0-2.0	SS	8	10	19	50	N/A	24	14	N/A	29	SANDY LIMESTONE FILL
4	2	2.0-4.0	SS	44	38	30	25	N/A	24	16	N/A	68	SANDY LIMESTONE FILL
6	3	4.0-6.0	SS	17	18	12	20	N/A	24	18	N/A	30	TOP SOIL AND SANDY LIMESTONE FILL
8	4	6.0-8.0	SS	22	30	24	31	N/A	24	15	N/A	54	SANDY LIMESTONE FILL
10	5	8.0-10.0	SS	4	6	16	16	N/A	24	23	N/A	22	SANDY LIMESTONE FILL
12	6	10.0-12.0	SS	5	9	10	13	N/A	24	24	N/A	19	SANDY LIMESTONE FILL
17	7	15.0-17.0	SS	6	4	4	5	N/A	24	6	N/A	8	COARSE SAND AND SANDY LIMESTONE
22	8	20.0-22.0	SS	10	9	15	18	N/A	24	22	N/A	24	SAND AND SANDY LIMESTONE
27	9	25.0-27.0	SS	1	0	0	1	N/A	24	6	N/A	0	COARSE SAND AND SANDY LIMESTONE
32	10	30.0-32.0	SS	32	50			N/A	10	9	N/A	50	SANDY LIMESTONE
37	11	32.0-37.0	RC	REFUSAL				N/A	60	0	N/A		WELL CEMENTED LIMEROCK

Proportions Used: trace = < 5%, few = 5-10%, little = 15-25%, some = 30-45%, and = 50-100%

Notes:

ENGINEER

BORING / SAMPLE LOG

BORING #: B5

ENGINEERING AND TECHNICAL SERVICES P.O. BOX SS 5589 NASSAU, BAHAMAS	**PROJECT:**	ISLAND POWER	**SHEET:**	1
	LOCATION:	ARAWAK CAY Nassau, Bahamas	**OF:**	1

DRILLING CO:	ETS	**START DATE:**	12/28/2024	**CASING:** 3.5' HAS	**COORDINATES:**	
DRILLER:	Thomas	**WATER DEPTH**	8	**SAMPLER:** 2" SS-SPT		
ENGINEER:	LK	**HAMMER WT:**	140	**CORE BARREL:**		
Drill Rig:		**FALL:**	30	**SEABED ELEV:**		

BORING RECORD

Depth (ft)	Sample No.	Depth Range (feet)	Samp. Type	0-12 0-6	12-24 6-12	24-36 12-18	36-48 18-24	48-60 N/A	Pen. (inch)	Rec. (inch)	RQD (%)	SPT "N" / UCS	FIELD DESCRIPTION AND REMARKS
2	1	0.0-2.0	SS	19	24	22	15	N/A	24	13	N/A	46	SANDY LIMESTONE FILL
4	2	2.0-4.0	SS	18	17	19	27	N/A	24	24	N/A	36	TOP SOIL SANDY LIMESTONE FILL
6	3	4.0-6.0	SS	15	18	21	21	N/A	24	19	N/A	39	COARSE SAND AND SANDY LIMESTONE
8	4	6.0-8.0	SS	19	21	20	22	N/A	24	24	N/A	41	COARSE SAND AND SANDY LIMESTONE
10	5	8.0-10.0	SS	5	7	19	17	N/A	24	15	N/A	26	COARSE SAND AND SANDY LIMESTONE
12	6	10.0-12.0	SS	8	11	12	14	N/A	24	24	N/A	23	COARSE SAND AND SANDY LIMESTONE
17	7	15.0-17.0	SS	5	4	9	7	N/A	24	12	N/A	13	COARSE SAND AND SANDY LIMESTONE
22	8	20.0-22.0	SS	9	12	10	9	N/A	24	16	N/A	22	COARSE SAND AND SANDY LIMESTONE
27	9	25.0-27.0	SS	3	5	4	3	N/A	24	14	N/A	9	COARSE SAND AND SANDY LIMESTONE
32	10	30.0-32.0	SS	19	22	15	24	N/A	24	24	N/A	37	SANDY LIMESTONE AND ROCK FRAGMENTS
37	11	35.0-37.0	SS	22	25	50		N/A	16	15	N/A	75	SANDY LIMESTONE AND ROCK FRAGMENTS
42	12	37.0-42.0	RC					N/A	60	9	0	50	WELL CEMENTED LIMEROCK

Proportions Used: trace = < 5%, few = 5-10%, little = 15-25%, some = 30-45%, and = 50-100%

Notes:

ENGINEER

BORING / SAMPLE LOG

BORING #: B6

ENGINEERING AND TECHNICAL SERVICES P.O. BOX SS 5589 NASSAU, BAHAMAS	**PROJECT:**	ISLAND POWER	**SHEET:**	1
	LOCATION:	ARAWAK CAY Nassau, Bahamas	**OF:**	1

DRILLING CO:	ETS	**START DATE:**	12/29/2024	**CASING:** 3.5' HAS	**COORDINATES:**	
DRILLER:	Thomas	**WATER DEPTH**	9	**SAMPLER:** 2" SS-SPT		
ENGINEER:	LK	**HAMMER WT:**	140	**CORE BARREL:**		
Drill Rig:		**FALL:**	30	**SEABED ELEV:**		

BORING RECORD

Depth (ft)	Sample No.	Depth Range (feet)	Samp. Type	0-12 0-6	12-24 6-12	24-36 12-18	36-48 18-24	48-60 N/A	Pen. (inch)	Rec. (inch)	RQD (%)	SPT "N" / UCS	FIELD DESCRIPTION AND REMARKS
2	1	0.0-2.0	SS	18	38	45	40	N/A	24	16	N/A	83	SANDY LIMESTONE FILL
4	2	2.0-4.0	SS	18	17	19	27	N/A	24	16	N/A	36	SANDY LIMESTONE FILL
6	3	4.0-6.0	SS	17	19	15	21	N/A	24	16	N/A	34	SANDY LIMESTONE FILL
8	4	6.0-8.0	SS	7	16	8	7	N/A	24	17	N/A	24	COARSE SAND AND SANDY LIMESTONE
10	5	8.0-10.0	SS	7	5	6	7	N/A	24	23	N/A	11	COARSE SAND AND SANDY LIMESTONE
12	6	10.0-12.0	SS	7	9	4	4	N/A	24	16	N/A	13	COARSE SAND AND SANDY LIMESTONE
17	7	15.0-17.0	SS	5	11	6	7	N/A	24	12	N/A	17	COARSE SAND AND SANDY LIMESTONE
22	8	20.0-22.0	SS	6	5	5	6	N/A	24	17	N/A	10	COARSE SAND AND SANDY LIMESTONE
27	9	25.0-27.0	SS	4	4	5	7	N/A	24	16	N/A	9	SAND AND SANDY LIMESTONE
32	10	30.0-32.0	SS	46	50			N/A	11	13	N/A	50	SANDY LIMESTONE AND ROCK FRAGMENTS
36	11	31.0-36.0	RC					N/A	60	30	0	50	CEMENTED SANDY LIMESTONE

Proportions Used: trace = < 5%, few = 5-10%, little = 15-25%, some = 30-45%, and = 50-100%

Notes:

ENGINEER

BORING / SAMPLE LOG

BORING #: B7

	ENGINEERING AND TECHNICAL SERVICES **P.O. BOX SS 5589** **NASSAU, BAHAMAS**	**PROJECT:**	ISLAND POWER	**SHEET:**	1
		LOCATION:	ARAWAK CAY Nassau, Bahamas	**OF:**	1

DRILLING CO:	ETS	**START DATE:**	12/29/2024	**CASING:** 3.5' HAS	**COORDINATES:**	
DRILLER:	Thomas	**WATER DEPTH**	9	**SAMPLER:** 2" SS-SPT		
ENGINEER:	LK	**HAMMER WT:**	140	**CORE BARREL:**		
Drill Rig:		**FALL:**	30	**SEABED ELEV:**		

BORING RECORD

Depth (ft)	Sample No.	Depth Range (feet)	Samp. Type	0-12 0-6	12-24 6-12	24-36 12-18	36-48 18-24	48-60 N/A	Pen. (inch)	Rec. (inch)	RQD (%)	SPT "N" / UCS	FIELD DESCRIPTION AND REMARKS
2	1	0.0-2.0	SS	20	36	34	32	N/A	24	11	N/A	70	TOP SOIL AND IMPORTED FILL
4	2	2.0-4.0	SS	17	14	40	50	N/A	24	24	N/A	54	COARSE SAND AND SANDY LIMESTONE
6	3	4.0-6.0	SS	50				N/A	6	6	N/A	50	SANDY LIMESTONE AND ROCK FRAGMENTS
8	4	6.0-8.0	SS	10	13	10	13	N/A	24	14	N/A	23	COARSE SAND AND SANDY LIMESTONE
10	5	8.0-10.0	SS	12	10	14	11	N/A	24	23	N/A	24	SAND AND SANDY LIMESTONE
12	6	10.0-12.0	SS	13	16	18	31	N/A	24	2	N/A	34	SAND AND SANDY LIMESTONE
17	7	15.0-17.0	SS	10	9	9	15	N/A	24	12	N/A	18	SILTY SAND AND SANDY LIMESTONE
22	8	20.0-22.0	SS	8	7	5	6	N/A	24	19	N/A	12	SILTY LIMESTONE
27	9	25.0-27.0	SS	2	1	2	2	N/A	24	24	N/A	3	SILTY LIMESTONE
32	10	30.0-32.0	SS	24	41	45		N/A	20	12	N/A	86	SANDY LIMESTONE AND ROCK FRAGMENTS
36	11	30.0-35.0	RC					N/A	60	30	0	50	CEMENTED SANDY LIMESTONE

Proportions Used: trace = < 5%, few = 5-10%, little = 15-25%, some = 30-45%, and = 50-100%

Notes:

ENGINEER

TEST PIT
PHOTOGRAPHS

TEST PIT #1

TEST PIT #2

TEST PIT #3

TEST PIT #4

TEST PIT #5

TEST PIT #6

Appendix D: Ground Penetrating Radar (GPR) Survey

Ground Penetrating Radar Report
Proposed Power Plant Site
Arawak Cay, Bahamas

Prepared By

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Submitted

Status: Draft
Date: March 26, 2025
Spotlight Project Number: 2025580

CERTIFICATION

I hereby certify that this document has been prepared in accordance with generally accepted geophysical exploration and interpretation practices.

Authored by:

_____
Ronald Kaufmann, PGp
President – Spotlight Geophysical Services, LLC
Licensed Professional Geophysicist - California #1071

Reviewed by:

_____
Lambert Knowles, PE
President – Engineering & Technical Services Consulting Engineers

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LIST OF FIGURES

BACKGROUND

ETS Ltd. (ETS) is assessing subsurface conditions at a proposed power plant site on Arawak Key, Bahamas. Arawak Key is a manmade island on the north coast of New Providence Island that is composed of sandy limestone fill. Recent geotechnical testing encountered a mixture of sand and limestone fill to a depth of 32 feet below the surface (ETS, 2025). The fill overlies limestone that is regionally known to contain karst features such as caves and voids (Mylroie and Mylroie, 2013). ETS and Spotlight Geophysical Services, LLC (SGS) carried out a ground penetrating radar (GPR) survey to non-invasively map anomalies due to heterogeneities such as voids and debris within the fill. This report documents and summarizes the results from the GPR survey.

TECHNICAL APPROACH

SURVEY AREAS

ETS acquired GPR data along survey lines spaced at approximate 10-foot intervals within the site (Figure 1). A Juniper Systems GNS3 Global Navigation Satellite System (GNSS) was used to acquire positioning data with the GPR data. Geographic coordinates are referenced to UTM Zone 18 in Meters (WGS84).

GROUND PENETRATING RADAR

Ground penetrating radar (GPR) uses high frequency electromagnetic energy to acquire subsurface information. Energy is radiated downward into the ground from a transmitter and is reflected to a receiving antenna. Reflections of the radar wave occur where there is a change in the dielectric constant between two materials. The reflected signals are recorded and produce a continuous cross-sectional image of shallow subsurface conditions. Applications include mapping shallow stratigraphy, identifying near surface anomalies such as soil raveling and voids, and locating man-made structures such as utilities and underground storage tanks.

GPR provides high-resolution images of the shallow subsurface, typically within the upper 20 feet. Generally, radar penetration is better in coarser, sandy conditions or massive rock; poorer results are obtained in fine-grained, clayey, and electrically conductive soils.

Data Acquisition

A Sensors and Software Noggin Gold radar system with a 250 MHz antenna was used for the GPR measurements. The radar signal penetrated to a maximum depth of 18 feet based on a radar velocity of 0.30 ft/ns measured at the site. *Note that this radar velocity is an average value observed across the site; however, the actual radar velocity varies primarily due to the moisture content of the soils and rock.*

Data Processing and Interpretation

The GPR data were processed with EKKO_Project6 software (Sensors and Software). The data were assessed for large hyperbolas, dipping reflectors, discontinuous reflectors and large-amplitude, ringing reflectors that are generally described as anomalies. These types of anomalies may be due to natural or man-made features, including voids, soil raveling, debris, and subsurface structures.

Quality Control

The GPR was calibrated and operated according to the manufacturer's instructions and ASTM Standards (ASTM, 2019).

Limitations

The detection of subsurface features with GPR (naturally occurring or man-made) is dependent on the size, depth, and dielectric properties of the feature. It is possible that anomalous features will not be detected if they are beyond the depth range of the GPR, lie between survey lines, are too small to generate a significant response, or do not have a sufficient dielectric contrast with the surrounding material. ***This survey was not designed to map utilities.***

RESULTS

The GPR data are of excellent quality across the entire survey area. Anomalies are generally classified as small (<3' wide), medium (3'-5' wide), and large (5'-10' wide). Examples of the GPR anomalies are shown in Figure 2. The locations of these anomalies are shown in Figure 3.

Most of the survey area contains non-anomalous, flat-lying GPR reflections that are characteristic of compacted fill (Figure 2). Small anomalies (<3' wide) are scattered throughout the survey area and are typical of limestone fill. These anomalies are most likely due to small heterogeneities within the fill such as limestone boulders and small voids.

A total of 13 medium anomalies (3-5' wide) and 2 large anomalies (5-10' wide) are present within the site. These anomalies are at an average depth of 8 feet below the surface, just above the groundwater reported to be at 9 to 10 feet below the surface (ETS, 2025). These medium and large anomalies may be due to boulders and voids within the fill. However, their proximity to the water table may indicate areas of erosion and possible origin points for fill raveling. Borings should be used to further investigate the larger anomalies.

> *"Geophysical anomaly" is defined as a deviation from uniformity in physical properties (Sheriff, 2002). It is a term often used in geophysics to denote an area that is different from the surrounding materials. Anomalies identified in this report are not confirmed until they are drilled and verified.*

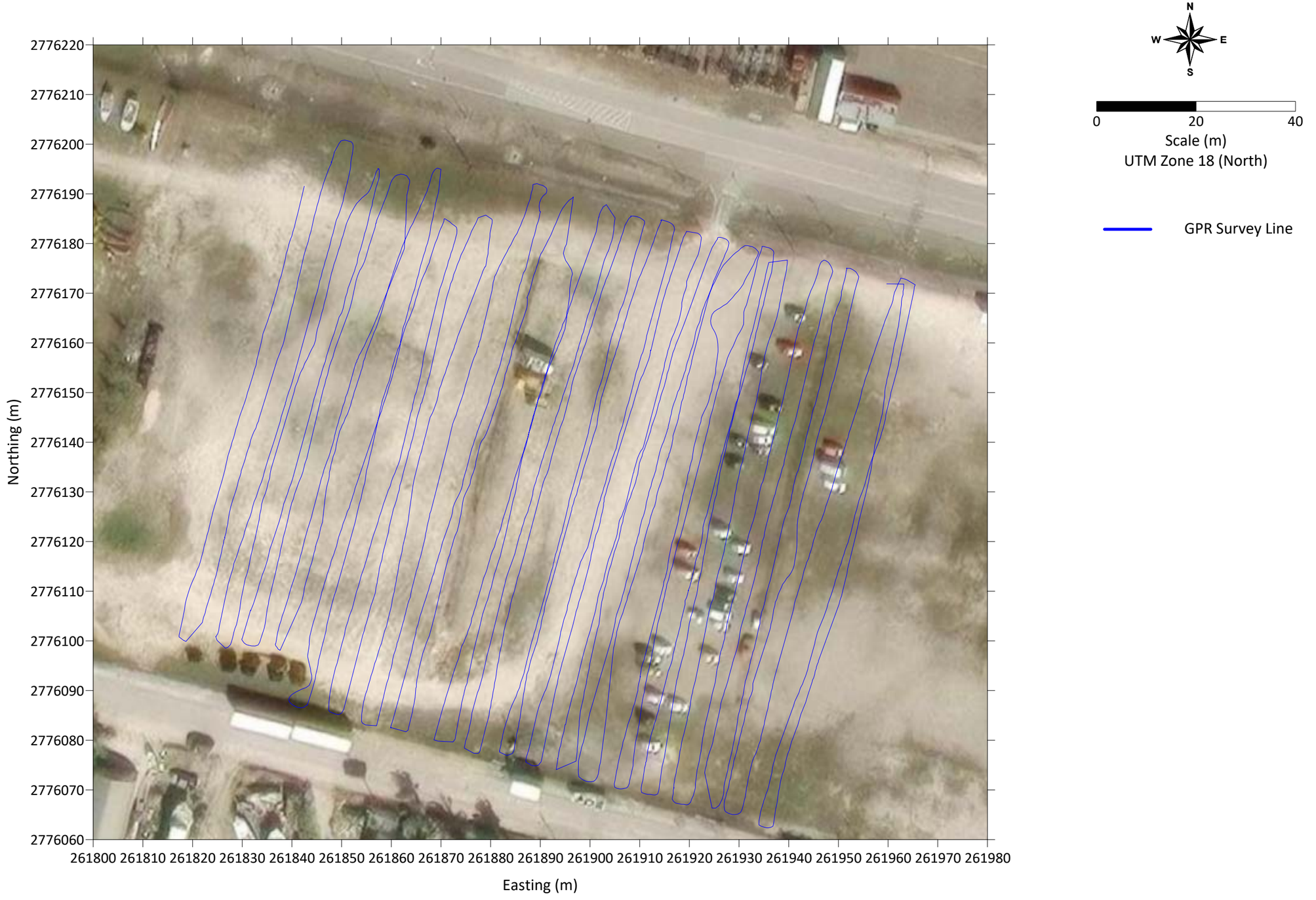
REFERENCES

ASTM, 2019, Standard guide for using the surface ground penetrating radar method for subsurface investigation, D6432-19, ASTM International, Conshohocken, PA, 17 p.

ETS, 2025, Island Power Limited, Arawak Cay, Geotechnical Report, Nassau, Bahamas, 25 p

Mylroie J.E., Mylroie J.R. (2013) Caves and Karst of the Bahama Islands. In: Lace M., Mylroie J. (eds) Coastal Karst Landforms. Coastal Research Library, vol 5. Springer, Dordrecht

Sheriff, R.E., 2002, *Encyclopedic dictionary of applied geophysics*, Society of Exploration Geophysicists, Fourth Edition, ISBN: 0-931830-47-8, 429 p.



SPOTLIGHT GEOPHYSICAL SERVICES

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Figure 1. GPR survey lines

Non-anomalous Compacted Fill

Medium Anomaly (3-5 feet wide)

Large Anomaly (5-10 feet wide)

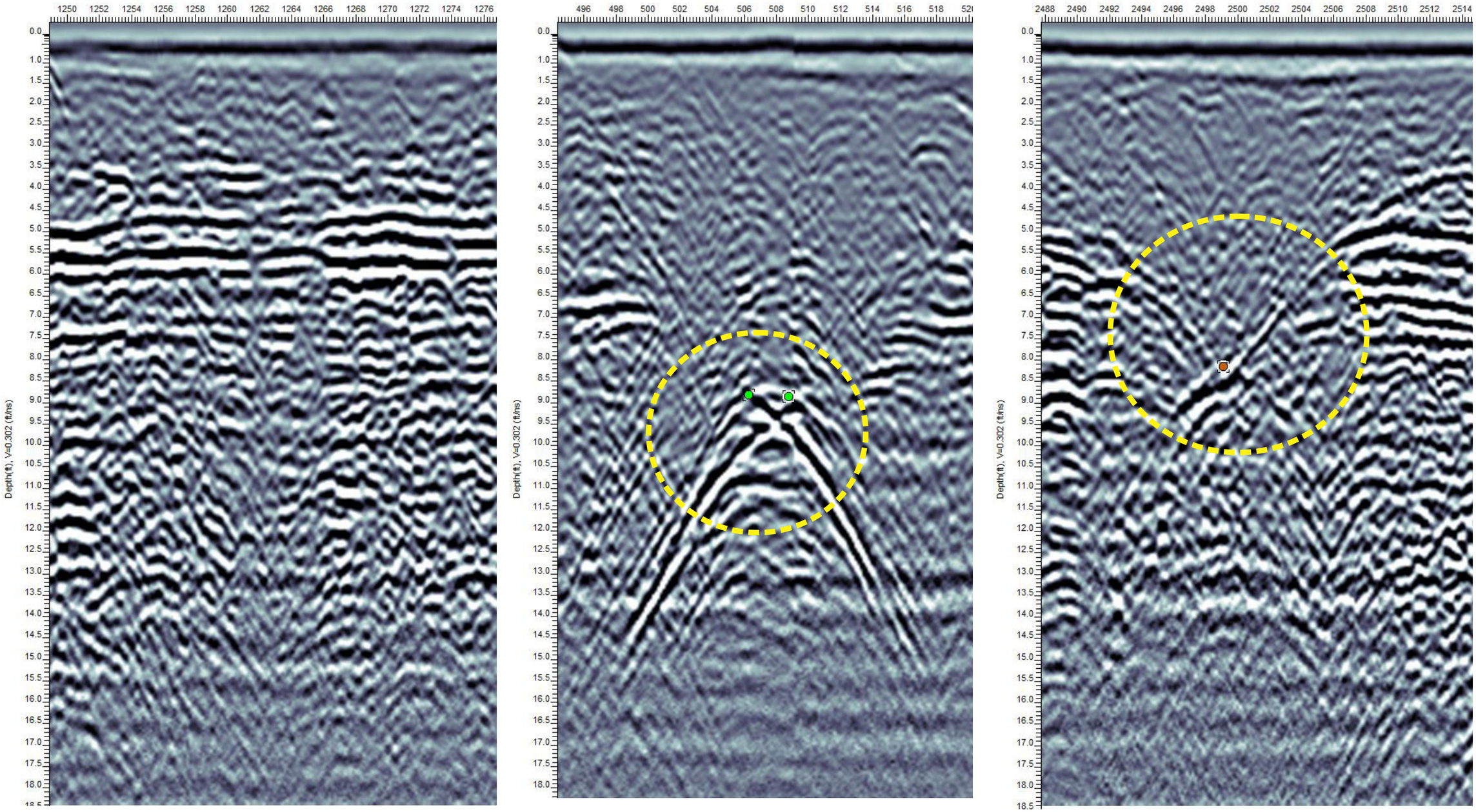

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Figure 2. Example of GPR anomalies

SPOTLIGHT GEOPHYSICAL SERVICES

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Figure 3. GPR anomaly locations

Interpretation	Depth(ft)	GPS-Easting (18R)	GPS-Northing (18R)	Latitude	Longitude
Large 5-10	8.2	261928.6	2776107.7	25.0820049	-77.3603900
Large 5-10	7.0	261913.9	2776104.6	25.0819747	-77.3605353
med 3-5	8.8	261944.7	2776097.7	25.0819175	-77.3602286
med 3-5	8.9	261944.9	2776098.4	25.0819236	-77.3602268
med 3-5	6.2	261937.0	2776128.6	25.0821949	-77.3603110
med 3-5	5.0	261911.2	2776075.5	25.0817118	-77.3605568
med 3-5	7.3	261922.7	2776122.3	25.0821360	-77.3604510
med 3-5	7.7	261936.9	2776177.5	25.0826358	-77.3603203
med 3-5	11.1	261914.5	2776106.6	25.0819924	-77.3605302
med 3-5	9.5	261905.0	2776118.2	25.0820958	-77.3606259
med 3-5	7.4	261882.1	2776079.1	25.0817400	-77.3608462
med 3-5	9.2	261878.3	2776111.6	25.0820318	-77.3608893
med 3-5	9.4	261865.4	2776115.3	25.0820636	-77.3610177
med 3-5	9.3	261860.2	2776107.9	25.0819958	-77.3610684
med 3-5	8.1	261848.8	2776138.7	25.0822721	-77.3611863
small less than 3	6.5	261956.0	2776131.7	25.0822258	-77.3601229
small less than 3	6.8	261955.3	2776128.8	25.0821992	-77.3601292
small less than 3	4.8	261955.3	2776128.6	25.0821980	-77.3601295
small less than 3	4.0	261954.0	2776123.7	25.0821531	-77.3601411
small less than 3	7.8	261953.3	2776120.5	25.0821244	-77.3601479
small less than 3	7.3	261945.6	2776094.7	25.0818902	-77.3602195
small less than 3	5.8	261938.8	2776073.4	25.0816971	-77.3602829
small less than 3	5.6	261935.7	2776062.4	25.0815972	-77.3603122
small less than 3	6.8	261947.6	2776106.3	25.0819957	-77.3602020
small less than 3	7.2	261948.9	2776110.3	25.0820314	-77.3601899
small less than 3	6.6	261950.5	2776115.5	25.0820790	-77.3601745
small less than 3	5.7	261953.2	2776144.9	25.0823446	-77.3601533
small less than 3	7.5	261951.6	2776139.9	25.0822993	-77.3601683
small less than 3	8.2	261950.4	2776136.3	25.0822669	-77.3601795
small less than 3	6.1	261948.3	2776129.5	25.0822049	-77.3601990
small less than 3	6.6	261932.2	2776073.6	25.0816979	-77.3603489
small less than 3	4.9	261941.2	2776115.8	25.0820801	-77.3602669
small less than 3	8.5	261954.0	2776173.1	25.0825991	-77.3601496
small less than 3	7.3	261947.2	2776155.3	25.0824374	-77.3602145
small less than 3	7.1	261946.9	2776154.0	25.0824260	-77.3602172
small less than 3	6.9	261929.0	2776080.1	25.0817556	-77.3603812
small less than 3	8.1	261928.6	2776077.9	25.0817360	-77.3603855
small less than 3	7.5	261943.9	2776168.9	25.0825592	-77.3602494
small less than 3	7.3	261922.2	2776077.2	25.0817288	-77.3604482
small less than 3	5.9	261917.2	2776067.4	25.0816395	-77.3604963
small less than 3	6.2	261932.4	2776143.9	25.0823318	-77.3603590
small less than 3	7.9	261933.5	2776165.8	25.0825304	-77.3603516
small less than 3	3.5	261927.4	2776138.8	25.0822850	-77.3604074
small less than 3	6.3	261912.0	2776069.1	25.0816539	-77.3605481
small less than 3	6.9	261926.1	2776135.8	25.0822581	-77.3604195
small less than 3	8.0	261931.3	2776154.0	25.0824235	-77.3603711
small less than 3	6.8	261924.3	2776145.1	25.0823417	-77.3604394

Interpretation	Depth(ft)	GPS-Easting (18R)	GPS-Northing (18R)	Latitude	Longitude
small less than 3	7.1	261918.7	2776122.7	25.0821391	-77.3604907
small less than 3	4.0	261909.6	2776081.6	25.0817665	-77.3605741
small less than 3	8.0	261910.1	2776092.8	25.0818672	-77.3605714
small less than 3	4.5	261919.8	2776133.8	25.0822387	-77.3604818
small less than 3	8.4	261922.7	2776145.6	25.0823463	-77.3604549
small less than 3	12.5	261925.5	2776155.9	25.0824397	-77.3604298
small less than 3	7.8	261916.0	2776137.9	25.0822751	-77.3605202
small less than 3	6.8	261916.0	2776137.9	25.0822751	-77.3605204
small less than 3	5.0	261912.0	2776124.0	25.0821491	-77.3605577
small less than 3	6.5	261897.7	2776072.7	25.0816844	-77.3606900
small less than 3	5.7	261898.2	2776077.9	25.0817313	-77.3606861
small less than 3	11.1	261907.2	2776111.2	25.0820327	-77.3606033
small less than 3	5.6	261912.7	2776132.5	25.0822261	-77.3605525
small less than 3	7.0	261902.3	2776106.9	25.0819940	-77.3606511
small less than 3	4.1	261898.6	2776088.5	25.0818271	-77.3606838
small less than 3	7.6	261898.5	2776088.0	25.0818221	-77.3606849
small less than 3	6.3	261893.5	2776076.4	25.0817169	-77.3607324
small less than 3	5.6	261897.3	2776091.7	25.0818553	-77.3606977
small less than 3	6.1	261908.7	2776133.7	25.0822363	-77.3605916
small less than 3	5.6	261909.0	2776134.9	25.0822477	-77.3605890
small less than 3	8.5	261913.8	2776150.7	25.0823910	-77.3605445
small less than 3	8.5	261922.3	2776180.0	25.0826560	-77.3604654
small less than 3	7.1	261893.4	2776091.4	25.0818523	-77.3607363
small less than 3	4.1	261887.5	2776077.5	25.0817261	-77.3607925
small less than 3	4.5	261887.8	2776078.9	25.0817385	-77.3607891
small less than 3	7.3	261885.7	2776083.2	25.0817775	-77.3608116
small less than 3	6.3	261887.9	2776098.4	25.0819150	-77.3607916
small less than 3	6.9	261889.5	2776104.0	25.0819652	-77.3607771
small less than 3	7.3	261906.7	2776168.0	25.0825460	-77.3606178
small less than 3	6.1	261911.0	2776184.1	25.0826916	-77.3605781
small less than 3	5.8	261908.2	2776185.5	25.0827035	-77.3606055
small less than 3	8.0	261905.9	2776180.0	25.0826537	-77.3606278
small less than 3	7.9	261901.3	2776182.6	25.0826768	-77.3606738
small less than 3	7.3	261884.0	2776126.1	25.0821639	-77.3608350
small less than 3	7.7	261890.0	2776177.6	25.0826294	-77.3607850
small less than 3	8.8	261880.6	2776145.9	25.0823424	-77.3608727
small less than 3	5.2	261864.2	2776098.5	25.0819118	-77.3610265
small less than 3	10.4	261867.4	2776110.1	25.0820167	-77.3609967
small less than 3	7.7	261870.1	2776119.0	25.0820974	-77.3609718
small less than 3	8.1	261874.7	2776132.9	25.0822242	-77.3609287
small less than 3	8.6	261891.1	2776190.1	25.0827426	-77.3607760
small less than 3	10.6	261871.7	2776140.9	25.0822952	-77.3609597
small less than 3	7.2	261857.0	2776082.9	25.0817697	-77.3610953
small less than 3	11.9	261860.8	2776111.0	25.0820243	-77.3610626
small less than 3	7.7	261862.4	2776119.4	25.0820999	-77.3610481
small less than 3	6.8	261870.8	2776153.8	25.0824123	-77.3609710
small less than 3	7.6	261869.3	2776195.1	25.0827846	-77.3609932

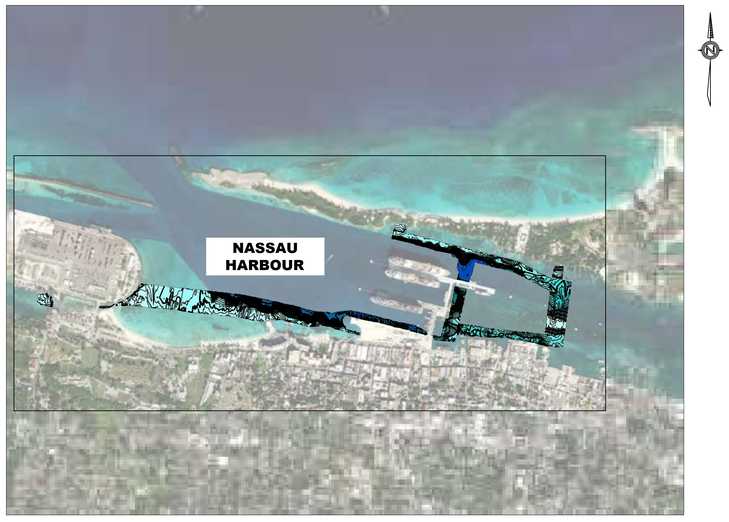
Interpretation	Depth(ft)	GPS-Easting (18R)	GPS-Northing (18R)	Latitude	Longitude
small less than 3	4.6	261855.7	2776159.8	25.0824635	-77.3611218
small less than 3	7.9	261851.3	2776146.0	25.0823380	-77.3611630
small less than 3	6.8	261846.9	2776130.3	25.0821963	-77.3612036
small less than 3	7.2	261844.2	2776126.0	25.0821571	-77.3612294
small less than 3	7.7	261850.4	2776147.6	25.0823530	-77.3611718
small less than 3	5.8	261863.0	2776187.1	25.0827113	-77.3610540
small less than 3	7.1	261840.5	2776129.4	25.0821870	-77.3612670
small less than 3	7.8	261850.5	2776167.5	25.0825325	-77.3611747
small less than 3	8.0	261852.5	2776174.1	25.0825919	-77.3611562
small less than 3	8.2	261856.2	2776188.0	25.0827178	-77.3611218

Appendix E: Bathymetry Studies

BATHYMETRIC SURVEY

NASSAU HARBOUR
NEW PROVIDENCE, THE BAHAMAS

VICINITY MAP



LOCATION PLAN

ISSUED FOR RECORD
MAY 23, 2025

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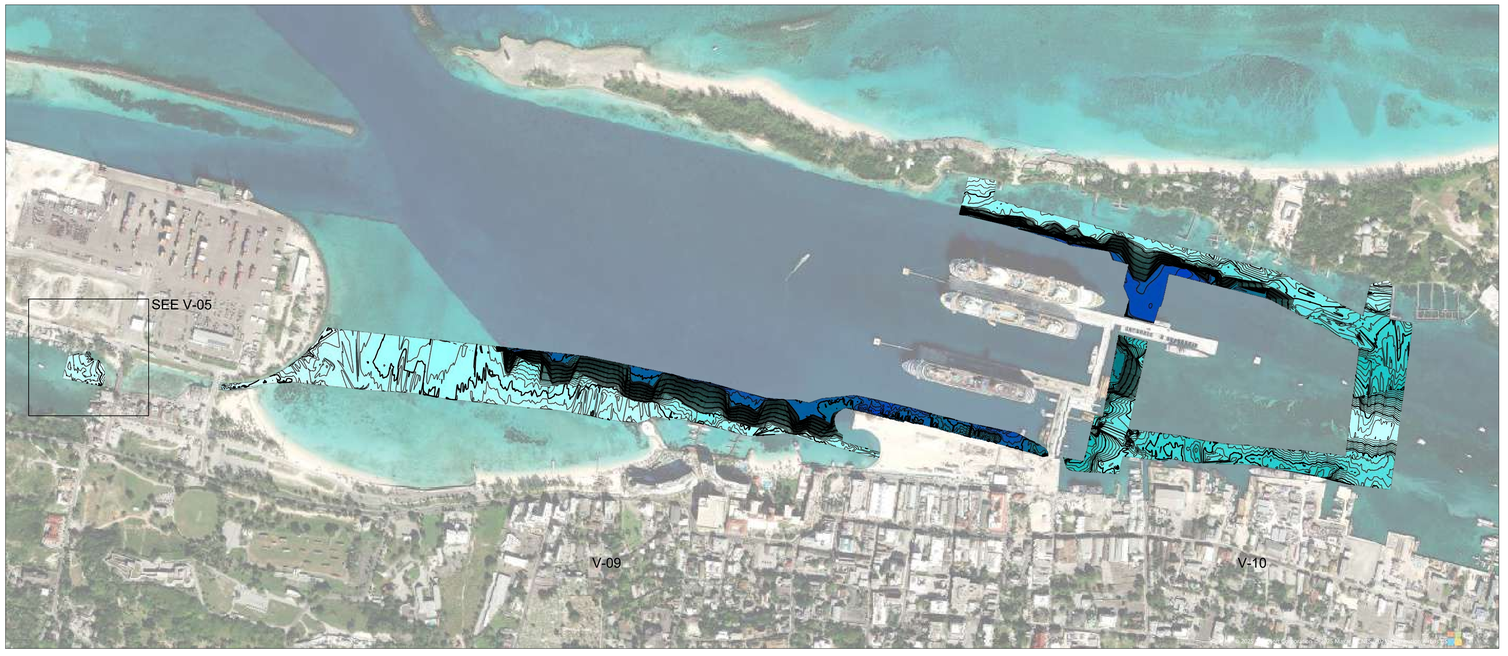

BATHYMETRIC SURVEY NOTES:

1. 1. THE SOUNDING DATUM IS MLLW
2. THE HORIZONTAL DATUM IS WGS84 UTM ZONE 18N
3. DEPTHS ARE SHOWN IN INTERNATIONAL FEET, POSITIVE DEPTH VALUES.
4. SOUNDINGS WERE OBTAINED BY SINGLE BEAM ECHOSOUNDER SURVEY BY BRON ON MAY 19, 2025

OVERALL CONTOUR PLAN

SCALE: 1" = 500'-0"

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PROJECT NAME:
BATHYMETRIC SURVEY
NASSAU HARBOUR
NEW PROVIDENCE, THE BAHAMAS

DRAWING DESCRIPTION:
OVERALL CONTOUR PLAN

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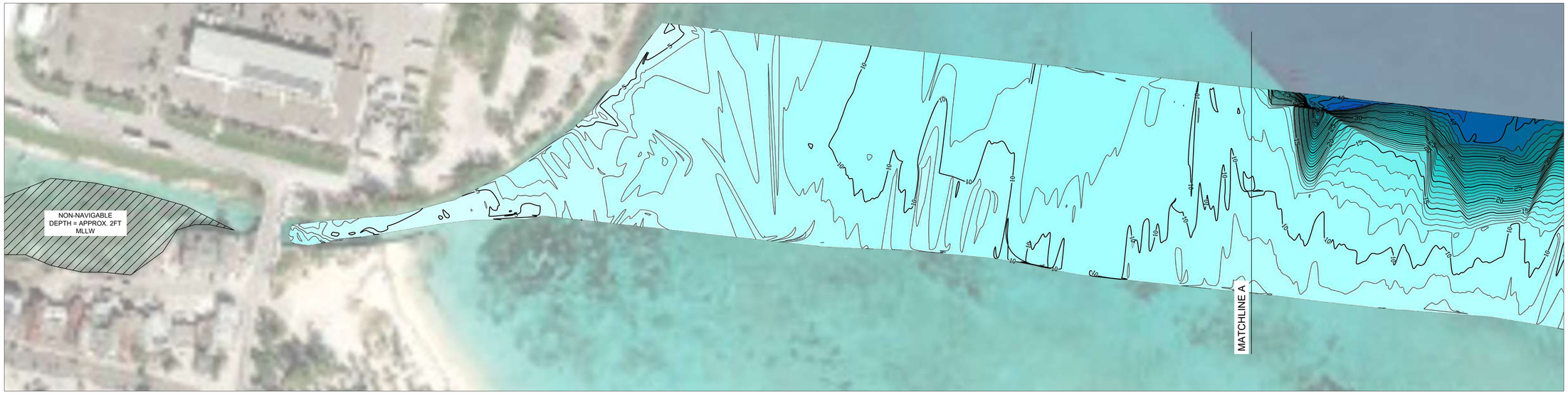
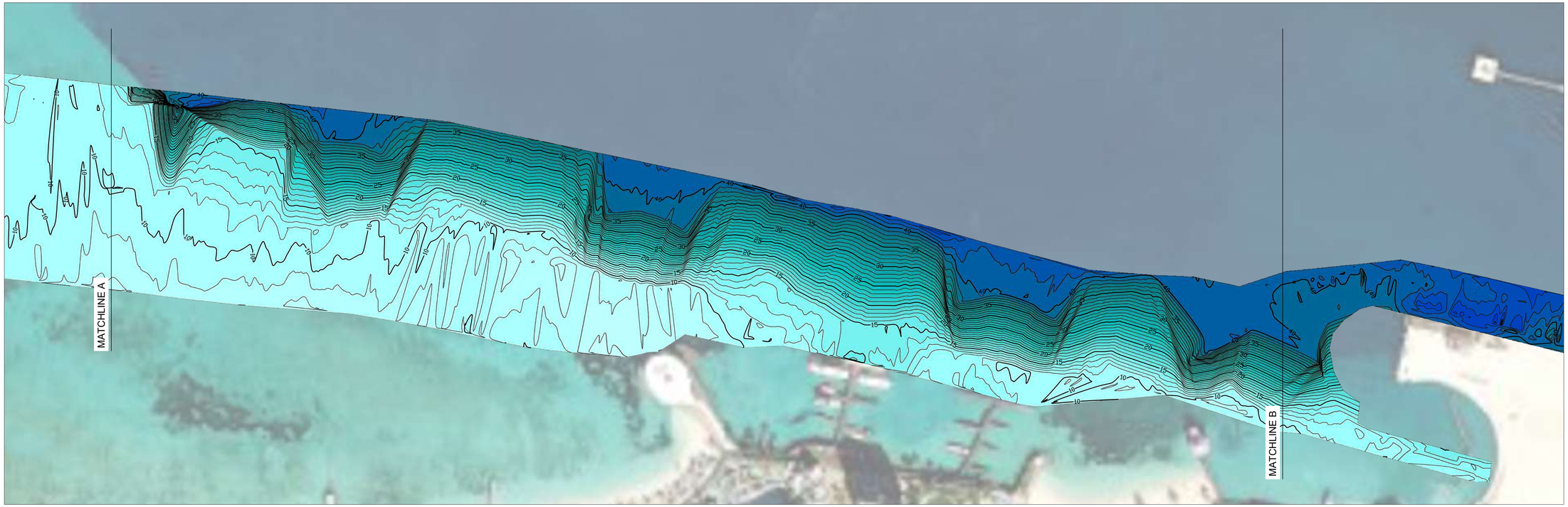


CONTOUR PLAN

SCALE: 1" = 100'-0"



CONTOUR PLAN

SCALE: 1" = 100'-0"

BATHYMETRIC SURVEY NOTES:

1. 1. THE SOUNDING DATUM IS MLLW
2. THE HORIZONTAL DATUM IS WGS84 UTM ZONE 18N
3. DEPTHS ARE SHOWN IN INTERNATIONAL FEET, POSITIVE DEPTH VALUES.
4. SOUNDINGS WERE OBTAINED BY SINGLE BEAM ECHOSOUNDER SURVEY BY BRON ON MAY 19, 2025

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NASSAU HARBOUR
NEW PROVIDENCE, THE BAHAMAS

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Drawing No.
V-02

CONTOUR PLAN

SCALE: 1" = 100'-0"

BATHYMETRIC SURVEY NOTES:

1. 1. THE SOUNDING DATUM IS MLLW
2. THE HORIZONTAL DATUM IS WGS84 UTM ZONE 18N
3. DEPTHS ARE SHOWN IN INTERNATIONAL FEET, POSITIVE DEPTH VALUES.
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NEW PROVIDENCE, THE BAHAMAS

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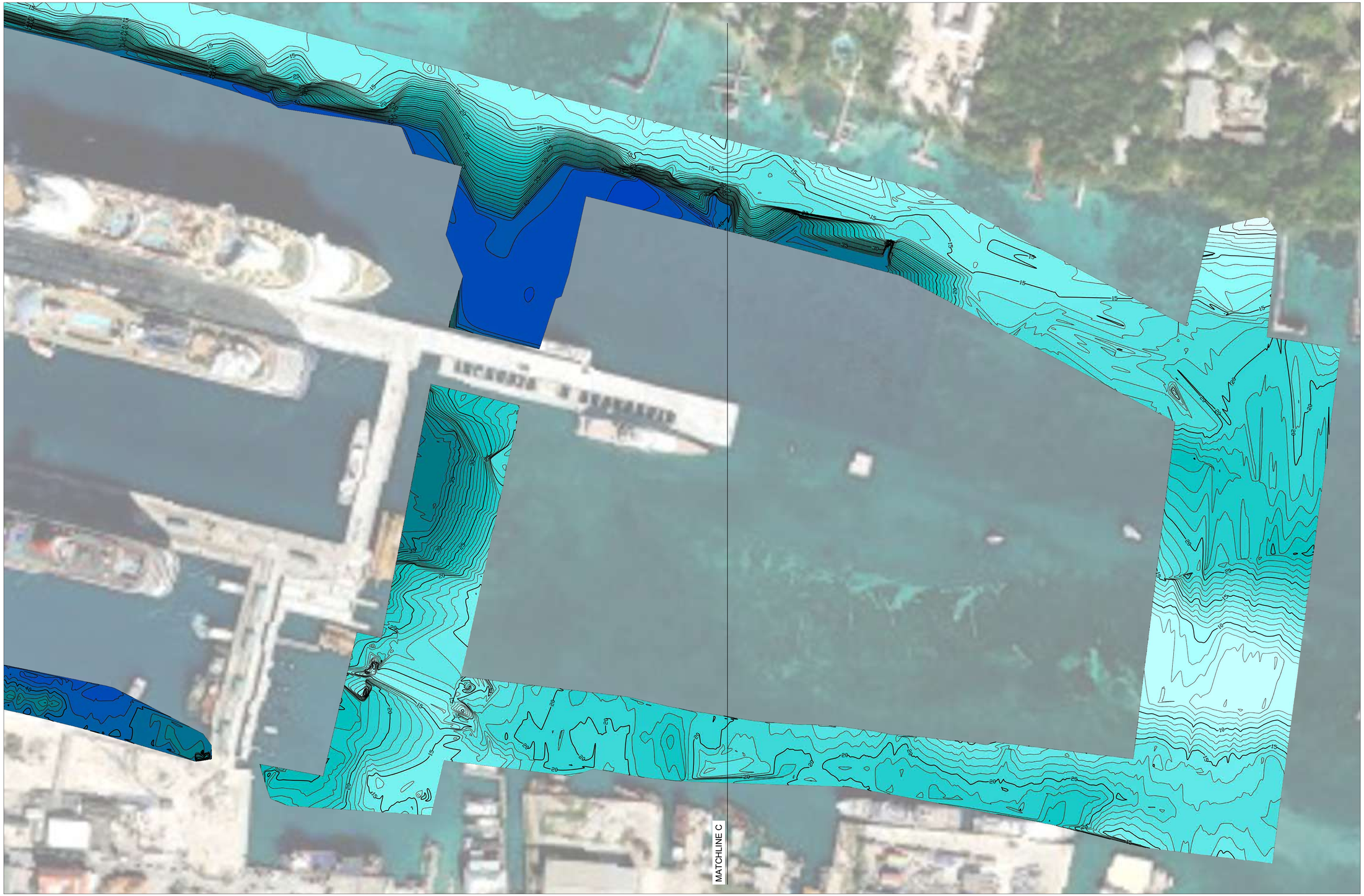

CONTOUR PLAN

SCALE: 1" = 100'-0"

BATHYMETRIC SURVEY NOTES:

1. 1. THE SOUNDING DATUM IS MLLW
2. THE HORIZONTAL DATUM IS WGS84 UTM ZONE 18N
3. DEPTHS ARE SHOWN IN INTERNATIONAL FEET, POSITIVE DEPTH VALUES.
4. SOUNDINGS WERE OBTAINED BY SINGLE BEAM ECHOSOUNDER SURVEY BY BRON ON MAY 19, 2025

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PROJECT NAME:
BATHYMETRIC SURVEY
NASSAU HARBOUR
NEW PROVIDENCE, THE BAHAMAS

DRAWING DESCRIPTION:
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Date MAY 2025	
Proj. No. 2025.027	

CONTOUR PLAN

SCALE: 1" = 100'-0"

BATHYMETRIC SURVEY NOTES:

1. 1. THE SOUNDING DATUM IS MLLW
2. THE HORIZONTAL DATUM IS WGS84 UTM ZONE 18N
3. DEPTHS ARE SHOWN IN INTERNATIONAL FEET, POSITIVE DEPTH VALUES.
4. SOUNDINGS WERE OBTAINED BY SINGLE BEAM ECHOSOUNDER SURVEY BY BRON ON MAY 19, 2025

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PROJECT NAME:
BATHYMETRIC SURVEY
NASSAU HARBOUR
NEW PROVIDENCE, THE BAHAMAS

DRAWING DESCRIPTION:
CONTOUR PLAN

REV.	NO.	DATE(dd/mm/yy)	ISSUE DESCRIPTION
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Date MAY 2025	
Proj. No. 2025.027	

Appendix F: Marine Spot Checks GPS Coordinates

Spot Check	Date	Latitude	Longitude	Depth (ft)	Habitat Description
1	9/5/2025	25°4'56.41"N	77°21'18.34"W	3.5	Hard Bottom with moderate Turtle Grass, Mustard Hill Coral, patches of Sandy Bottom with loose rubble
2	9/5/2025	25°4'56.23"N	77°21'17.64"W	9	Hard Bottom with Macroalgae and Black Ball Sponges
3	9/5/2025	25°4'55.59"N	77°21'15.29"W	11	Hard Bottom with Macroalgae
4	9/5/2025	25° 4'54.85"N	77°21'12.53"W	12	Sandy Bottom with Macroalgae and Southern Lugworm Mounds
5	9/5/2025	25°4'54.12"N	77°21'9.86"W	10.05	Sandy Bottom with Macroalgae, Southern Lugworm Mounds and Black Ball Sponge
6	9/5/2025	25°4'53.37"N	77°21'7.08"W	11.5	Sandy Bottom with Macroalgae and Southern Lugworm Mounds
7	9/5/2025	25°4'52.65"N	77°21'4.43"W	45.5	Silt with Macroalgae
8	9/5/2025	25°4'51.90"N	77°21'1.63"W	16	Silt with Macroalgae
9	9/5/2025	25°4'51.17"N	77°20'58.90"W	12.5	Silt with Macroalgae
10	9/5/2025	25°4'50.44"N	77°20'56.20"W	11.5	Sandy Bottom with moderate Turtle Grass, and sparse Macroalgae
11	9/5/2025	25°4'49.72"N	77°20'53.53"W	10	Sandy Bottom with sparse Macroalgae
12	9/5/2025	25°4'48.98"N	77°20'50.83"W	11	Sandy Bottom with sparse Macroalgae and Seagrass
13	9/5/2025	25°4'48.24"N	77°20'48.08"W	9	Moderate to Dense Turtle Grass
14	9/5/2025	25°4'47.50"N	77°20'45.37"W	9	Sandy Bottom with Manatee Grass and sparse Macroalgae

15	9/5/2025	25°4'46.93"N	77°20'43.25"W	8	Sandy Bottom with Macroalgae and Southern Lugworm Mounds
16	9/5/2025	25°4'46.56"N	77°20'41.90"W	8.6	Sandy Bottom with Southern Lugworm Mounds

Appendix G: Environmental Management Plan Outline

JSS CONSULTING
Environmental Consulting Services

ARAWAK CAY LNG PROJECT

Environmental Management Plan Outline

Prepared by: JSS Consulting Ltd.

Date: September 30th, 2025

1.0 Environmental Management Plan Outline

Below is a description of the main components of the Environmental Management Plan (EMP).

1.1 Introduction

The introduction of the EMP describes the purpose and objective of the EMP. It outlines key focus areas of the EMP as well as the scope of the EMP.

1.2 Project Description

This section outlines the scope of The Project. This will include a description of the project components and utility infrastructure.

1.3 Laws and Regulations

This section outlines all national environmental laws, regulations and policies applicable to The Bahamas. This section will also include international and regional policies, standards and guidelines applicable to The Project.

1.4 Existing Site Conditions

This section gives a summary of the baseline conditions of the site. This will include the methodology used in surveys, general observations taken during the surveys, habitat and benthic description of The Project site, a vegetation map, a benthic habitat map, a species list (botanical, avian and marine species) and commercially important, endangered, invasive, and protected species encountered.

1.5 Environmental Management Framework

This section outlines conditions of when the EMP will be updated as well and the role and responsibilities of key personnel onsite with environmental responsibility such as the project manager, site supervisor, environmental manager and environmental monitor.

1.6 Environmental Management Tools

This section outline tools used to ensure environmental compliance and upkeep health and safety requirements. Tools include but are not limited to, site inspections, reports and communications, documentation, meetings, environmental monitoring and environmental health and safety regulations.

1.7 Construction Work Methodology

The construction methodology will detail how. Work will be carried out to complete The Project. Construction methods employ best management practices to minimize or mitigate impacts on the environment.

1.8 Register of Significant Aspects and Impacts

The Register of Significant Aspects and Impacts (The Register) considers potential impacts that may be due to project activities. The Register evaluates the potential impacts identified in the Environmental Impact Assessment, assigns risk and magnitude scores and summarized mitigation measures.

1.9 Environmental Impacts and Mitigations

This section outlines the potential impacts of The Projects, activities associated with the impact, and detail mitigation measures to ensure impacts are minimized. Impacts for the project include, physical impacts, biological impacts and socio-economic impacts.

1.10 Management Plan

Management plans outline specific strategies, procedures, and responsibilities for addressing key environmental or social aspects of a project. These plans ensure that impacts are effectively mitigated or avoided throughout the lifespan of The Project.

1.11 Appendices

Location where all additional supporting information is added to the document.

2.0 Structure of the EMP

1.0 Introduction
- 1.1 Purpose and Objective

2.0 Project Description
- 2.1 Project Location

3.0 Laws, Regulations and Requirements
- 3.1 National Environmental Laws and Regulations Applicable to The Bahamas
- 3.2 National Environmental Policies of The Bahamas
- 3.3 ISO 14000
- 3.4 Occupational Safety and Health Administration (OSHA)
- 3.5 Government Departments

4.0 Existing Site Conditions
- 4.1 Physical Environment
- 4.2 Terrestrial Environment
  - 4.2.1 Botanical Survey
  - 4.2.2 Avian Survey
- 4.3 Marine Environment

5.0 Environmental Management Framework
- 5.1 Construction Management
  - 5.1.1 Roles and Responsibilities

6.0 Environmental Management Tools
- 6.1 Site Inspections
- 6.2 Reports and Communications
- 6.3 Incident Reports
- 6.4 Checklist for Environmental Stipulations

Appendix H: Stakeholder Engagement

STAKEHOLDER ENGAGEMENT PLAN

ARAWAK CAY SHORE POWER FOR NEW PROVIDENCE CRUISE SHIP TERMINAL PROJECT

ISLANDS BY DESIGN
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JANUARY 2025

APPENDIX I: STAKEHOLDER ENGAGEMENT PLAN

1) Introduction

This Stakeholder Engagement Plan ("SEP") seeks to establish the methodology for engaging stakeholders as the Bahamas government and BPL explore a 60MW shore power system for the New Providence Cruise Ship Terminal to reduce cruise ship emissions by connecting them to the local grid. Stakeholder Engagement is an integral component of informed decision-making and responsible development. This SEP supports the development of strong, constructive and responsible relationships with project stakeholders that are important to and integral for the successful management of the project's environmental and social risks.

The scope of this Stakeholder Engagement Plan seeks to be proportionate to the nature and scale of the project and its potential risks and impacts.

2) Purpose and Scope

The purpose of this SEP is to define the project approach to consultation and disclosure. The specific objectives of this SEP are to:

A. Meet the regulatory requirements for obtaining a certificate of environment clearance
B. Identify key stakeholders that are affected and/or influence the project
C. Identify the most effective methods to disseminate project information
D. Ensure regular, accessible, transparent and appropriate consultation
E. Build and maintain mutually respectful, beneficial and lasting relationships with stakeholders
F. Assess the level of stakeholder interest and support for the project and to enable stakeholders' views to be taken into account through the project cycle
G. Promote and provide opportunities for effective and inclusive engagement with stakeholders throughout the Project life cycle on issues that could potentially affect them
H. Establish formal grievance/resolution mechanisms
I. Ensure that appropriate project information is disclosed to stakeholders in a timely, understandable, accessible and appropriate manner and format
J. Create an atmosphere of understanding
K. Define roles and responsibilities for the implementation of the SEP
L. Define reporting and monitoring measures
M. Improve and facilitate decision-making

3) Project Description

The Bahamas government and BPL are exploring a 60MW shore power system for the New Providence Cruise Ship Terminal to reduce emissions and support greener maritime operations. Shore power allows docked cruise ships to connect to the local grid that can cut pollutants. While successfully used in ports like Los Angeles, BPL currently lacks the capacity to supply the required power. This initiative aligns with The Bahamas' sustainability goals and complements the $300 million Nassau Cruise Port investment, aiming to reduce the environmental impact of cruise tourism.

4) Roles & Responsibilities

In order to properly implement the SEP, the Project requires the involvement of the people listed below.

Role	Responsibilities
Project Owner	● Overall responsibility for the implementation of the Project ● Facilitate engagement with other high-level decision-making stakeholders
Environmental Manager	● Comply with the SEP and coordinate, together with the Community Relations Officer, the implementation of the relationship and communication actions ● Review and approve the contractor project-specific SEP. ● Review and update the SEP
Community Liaison Officer	● Implement the Stakeholder Engagement Plan. ● Coordinate, together with the Environmental Manager, the implementation of the relationship and communication actions ● Ensure a constant communication channel with the Project Stakeholders

Contractor	● Develop a project-specific Stakeholder Engagement Plan

Table 10 : Roles and Responsibilities

5) Stakeholder Identification and Analysis

Stakeholders are individuals or groups who are directly or indirectly affected by a project, as well as those who may have interests in a project and/or the ability to influence its outcome, either positively or negatively.

The main stakeholders for this Project are as follows:

Internal/Direct Stakeholders

Internal/direct stakeholders are those who are directly associated or involved in a project and who are within the organizational structure of a project. Internal stakeholders for this Project include the Project Sponsor The Government of The Bahamas, Ministry of Energy Transport Executing Agency (Bahamas Power and Light), members of the Project team, consultants, contractors and subcontractors as well as construction employees.

External/Indirect Stakeholders

External/indirect stakeholders are those who are not directly involved with a project and who do not contribute to its internal operations, but who are impacted by that project and are affected somehow by the actions and outcomes of that project. Key external/indirect stakeholders for this Project include:

Government Entities

Government ministries, departments and agencies are integral to the overall success of the Project. They are critical to the establishment of the physical, technical, legal and regulatory framework of the Project and are responsible for approvals and permits required for the Project to progress. It is expected that all government entities will benefit from the Project. The key government entities that will be consulted include:

- Department of Environment Planning and Protection (Ministry of the Environment and Natural Resources) - The mandate of this Department (DEPP) is to provide for the prevention or control of pollution, the regulation of activities and the administration, conservation and sustainable use of the environment and for connected purposes. DEPP also manages multilateral environmental agreements.

- Department of Environmental Health (Ministry of the Environment and Natural Resources) - This Department's mission is to promote and maintain a clean health environment and protection of the public's health through vigorous and consistent monitoring and the application of environmental education and enforcement.

- Department of Physical Planning (Ministry of Works & Utilities) - This Department's mission is to provide the strategic framework for the proper management of change in our physical environment and to facilitate the participation and education of the public regarding planning issues, while promoting sustainable and attractive communities.

- Bahamas Ministry of Tourism, Investments & Aviation is responsible for promoting and developing the country's tourism sector, facilitating investments, and overseeing civil aviation

Municipal Authorities & Corporations

- Bahamas Maritime Authority
- Nassau Cruise Port Ltd.
- Arawak Port Development
- The Port Department

Civil Society and Non-Governmental Organizations (NGOs)

In The Bahamas civil society groups consist of a wide variety of organizations, including private sector entities, chambers of commerce, NGOs, environmental organizations (which may wish to review the environmental documentation and/or comment on environmental matters of concern) and other groups. Civil society groups and NGOs that will be included in the stakeholder consultation process are listed below:

- Bahamas National Trust - The Bahamas National Trust is a science-based organization dedicated to effectively managing national parks to conserve and protect Bahamian natural resources.

- BREEF Bahamas - BREEF is a non-governmental nonprofit Bahamian foundation concerned with educating our people about the value of and need for conserving our marine environment.

- Waterkeepers Bahamas - Waterkeepers Bahamas is a non-profit organization which works to preserve and protect the lands, waters, and ecosystems of The Bahamas, and seeks to ensure that the waters of The Bahamas, including Grand Bahama, are safe for swimming and fishing for future generations.

- Bahamas Chamber of Commerce and Employers' Confederation: The Bahamas Chamber of Commerce and Employers' Confederation is a non-profit organization that advocates for its membership and the wider business community, and is committed to providing access, advice, and advocacy to ensure economic growth, environmental stewardship, and business development opportunities.

- The Nature Conservancy works to protect and restore marine and terrestrial ecosystems through sustainable fisheries, coral conservation, climate adaptation, and marine protected areas, ensuring environmental resilience and community well-being.

Other Interested Groups and Affected Parties

Generally, the project has the potential to impact multiple sectors of society in The Bahamas, particularly in areas related to tourism, energy, and environmental sustainability. Key affected groups may include cruise operators, local businesses, hotels, transportation providers, vendors, and tourism associations, as well as ongoing or planned development projects near the port. Communities surrounding the Cruise Port may experience changes due to reduced emissions and infrastructure modifications. However, the project is not expected to directly impact schools, churches, or residential areas, as its primary focus is on integrating shore power within the cruise terminal, which operates within a defined commercial and maritime zone.

Vulnerable Groups

Throughout The Bahamas in general, there are several identifiable disadvantaged or vulnerable groups who because of their prevailing characteristics face the risk of being excluded from the benefits of this project if not adequately engaged. These include low-income communities, women, the disabled and immigrant communities. In order to ensure that the Project does not further exacerbate existing exclusion errors, special efforts will be made to engage persons from these vulnerable groups and mitigate risks of social exclusion and elite capture (whereby public

resources are biased for the benefit of socially advantaged groups to the detriment of disadvantaged groups).

Specifically, stakeholder analysis will disaggregate data by age, gender, nationality, and level of education to measure progress. Other factors that may impede full participation are tabled below along with possible mitigation measures.

Factors	**Vulnerable Population**	**Mitigation Measures**
Language	Hearing/Vision impaired; Non-English speakers	Providing virtual closed-captioning for virtual meetings; providing meeting transcriptions and notes upon request; providing translated meeting transcriptions in language of prevailing non-English speakers upon request
Time/Availability	Those needing more time/notice to access consultation methods	Investigating the time/day where most members of target communities will be available for meetings; ensuring adequate notice of consultation is provided to community members; providing virtual access to meetings and consultation efforts
Meal	Low-income/Everyone	Ensuring light refreshments are provided at meetings
Location	Low-income; Physically disabled	Ensuring meetings are conducted in central locations that are easy to access; ensuring meeting locations are wheelchair accessible; providing virtual access to meetings; conducting interviews at people's places of employment or homes

		(where permitted)

Table 11: Factors Impacting Vulnerable Populations

6) Stakeholder Contact List

A comprehensive stakeholder contact list should be developed and maintained through the life of the project.

Last Name	First Name	Position	Organization	Telephone Contact	Email
Zonicle	Charles	Director	Department of Physical Planning	(242) 322-7550/2	charleszonicle@bahamas.gov.bs
Neely	Rhianna	Director	Department of Environmental Planning and Protection (Ministry of the Environment and Natural Resources)	(242) 322-6005, 6	rhiannaneely@bahamas.gov.bs
Mckenzie	Melony	Director	Department of Environmental Health (Ministry of the Environment and Natural Resources)	242) 322-8037 (242) 323-2295	melonymckenzie@bahamas.gov.bs
Cooper	The Hon. Chester	Minister	Ministry of Tourism, Investments and Aviation	(242) 302-2000	tourism@bahamas.com
Huchinson	Capt. Dwain	Managing Director and CEO	Bahamas Maritime Authority	(242) 356-5772	nassau@bahamasmaritime.com
Seymour	Toni	CEO	Bahamas Power and Light		
Coleby- Davis	Jobeth	Minister	Ministry of Energy and Transport	(242) 328-2701/5 or 397-5501	

Wright	Bernie	Acting Port Controller	The Port Department	(242)302-0200	bernewright@rbdf.gov.bs
Lightbourne	Zane	Minister of State for the Environment	Ministry Environment and Natural Resources	(242) 322-6027 or 322-60005/6	
Alston	Christina	Chairperson	Bahamas Power & Light Company	242.225.5275	pr@bplco.com
Anderson-Rolle	Lakeshia	Executive Director	Bahamas National Trust	242-393-1317	bnt@bnt.bs
McKinney- Lambert	Casuarina	Executive Director	BREEF Bahamas	242-327-9000	breef@breef.org
Darville	Joseph	President	Waterkeepers Bahamas	242-373-7558	connect@waterkeepersbahamas.com
Smith	Carlon	CEO and Board Member	URCA Bahamas	242-396-5200	
Rolle	Dr. Leo	Chief Executive OFficer	The Bahamas Chamber of Commerce	242-322-2145	info@thebahamaschamber.com

Table 12: Stakeholder Contact List

7) Stakeholder Analysis

Stakeholder analysis via stakeholder mapping is an important assessment tool which will aid the Project team in assessing how stakeholders can collaborate with or hinder the realization of what has been planned, and to begin identifying good ideas for defining strategies to work with these actors.

The *Interest x Influence* matrix at Table 62 below helps in the assessment and prioritization of the identified stakeholders, and allows the Project team to design strategies addressed to the different groups. The result of the interaction of the factors in this matrix suggests the type of management to be done with each group.

Stakeholder	Objectives or Targets	Level of Interest	Level of Influence	Possible Stakeholder Actions	Strategies for Engagement
The Government of The Bahamas	Sponsoring the Project	High	High	Can approve project; can act as internal and external "champion" of project Withdrawing support/funding for project; stopping or pausing project	Should be managed closely. Frequent communication.
Ministry of Energy and Transport	Approving the Project; Executing the Project	High	High	Can approve Project; can act as internal and external champion of project	Should be managed closely. Frequent communication.

				Can withdraw support of project; stopping or pausing project/project delays	
Bahamas Power and Light	Facilitating the Project	High	High	Can facilitate project Can cause project delays	Engaged as a core partner through regular strategy meetings, technical assessments, and capacity planning
Ministry of Tourism, Investments and Aviation	Ensure the project supports sustainable tourism goals, and aligns with national tourism strategy	High	Medium	Can delay or withdraw support if the project negatively impacts tourism revenue	Frequent communication
Department of Environmental Planning & Protection (DEPP)	Approving the Project	High	High	Can approve project Can stop or pause project; project delays	Should be managed closely. Frequent communication.
Other Government Agencies/	Facilitating the Project (through	Medium	Medium	Can facilitate project	Should be kept informed of project

Utility Corporations/ Municipal Authorities/	provision of utilities etc)			Can cause project delays	progress, changes, and risks
Project Team (Contractor, Project Manager, etc)	Manages the Project; Responsible for Project's technical, administrative, and operational management, etc.	High	High	Positive: Meet project objectives Negative: Project delays	Should be managed closely. Frequent communication.
NGOs, Community Groups, Neighboring Communities		High	Low	Show public support for project Public opposition to project	Should be kept informed of project progress Organize meetings and awareness events Should mitigate any negative stakeholder actions

Table 13: Stakeholder Analysis Matrix

8) Stakeholder Engagement Programme

An engagement and consultation strategy will be developed for this Project which will guide how stakeholders are engaged throughout the Project life cycle. Methods of engagement will be tailored for each stakeholder group.

Methods of Engagement

There are a variety of engagement techniques used to build relationships with stakeholders, gather information from stakeholders, consult with stakeholders, and disseminate project information to stakeholders. A list of common consultation techniques and the most appropriate application of these techniques are provided in Table 14 below. Consultation techniques to be used for specific stakeholder groups are outlined in Table 15 below.

Engagement will be conducted in a variety of ways in manners that are accessible and culturally appropriate. Methods that will be used to consult with each of the stakeholder groups identified above will be tailored based on the findings of the analysis and will include (but are not limited to) those outlined in the below tables.

The following criteria should be taken into consideration in determining the appropriate and most effective form of communication to be used for a stakeholder:

- Stakeholder proximity to the Project
- Number of persons impacted
- Degree of impact (positive or negative)
- Magnitude/significance of impact
- Extent of stakeholder influence on the Project
- Purpose of engagement
- Audience to be addressed

ENGAGEMENT TECHNIQUE	MOST APPROPRIATE APPLICATION OF TECHNIQUE
Phone/Email/Text/ WhatsApp messaging	• Distribute project information to government officials, organizations, agencies and companies • Invite stakeholders to meetings

Print media, social media, and radio announcements	• Disseminate project information to large audiences, and illiterate stakeholders • Inform stakeholders about consultation meetings • Advertise jobs
One-on-one interviews	• Solicit views and opinions • Enable stakeholders to speak freely and confidentially about controversial and sensitive issues • Build personal relations with stakeholders • Address grievances
Formal meetings	• Present project information to a group of stakeholders • Allow the group of stakeholders to provide their views and opinions • Build impersonal relations with high level stakeholders • Distribute technical documents • Facilitate meetings using PowerPoint presentations • Record discussions, comments/questions raised and responses
Public meetings	• Present project information to a large audience of stakeholders, • Allow the group of stakeholders to provide their views and opinions • Distribute non-technical project information • Facilitate meetings using PowerPoint presentations, posters, models, videos and pamphlets or project information documents

	• Record discussions, comments/questions raised and responses
Surveys	• Gather opinions and views from individual stakeholders • Gather baseline data • Use WhatsApp to distribute survey • Use online survey tools (eg JotForm, Survey Monkey) to analyze responses • Develop a baseline database for monitoring impacts

Table 14: Consultation techniques and appropriate application

STAKEHOLDER GROUP	**CONSULTATION METHODS**
Government entities, Municipal Authorities, and Corporations	• Phone / email • One-on-one interviews • Formal meetings
Neighboring communities and businesses	• Print media, radio announcements, WhatsApp messages • Public meetings • Focus group meetings • Surveys • Information Centre • Poster/Signage
Civil society groups and NGOs	• Phone / fax / email / text messaging • One-on-one interviews • Focus group meetings • Information Centre

Table 15: Methods that will be used to consult and engage each stakeholder group

WSC should be used to disseminate information and receive feedback on the project. Key information should include:

- About: Provide Background information on the project and project proponents
- Documents: Provide link to download project documents such as ESIA and ESMP

- Feedback: Provide the opportunity for the public to post comments and or questions on the project-.
- Contact Us: Provide additional methods for communication.

9) Consultation and Participation Action Plan

The table below presents the consultation and participation plan per each stakeholder group. The table includes the consultation and participation methods, the consultation topics, shared information and objectives, the Project phase and frequency, and the responsible person.

Stakeholder Groups	**Participation Method**	**Consultation Topics, Shared Information and Objectives**	**Project Phase and Frequency**	**Responsible Person**
Internal stakeholders (Project Manager, Consultants, Contractors, Workers)	Meetings with representatives, either in groups or individually	■ Identify any concerns regarding Project impacts and progress ■ Answer their questions regarding the Project ■ Receive feedback about the	Construction: At least once a month Operations: at least once per six months	Human Resources (HR) Manager (appointed by Contractor)
Government Entities, Municipal Authorities, & Corporations			Construction: At least once a month Operations: at least once per six months	Community Liaison Officer (CLO)
Other Interested Groups and Affected Parties	Group meetings (virtually) with people from nearby residences, including women, young people and other vulnerable groups		Construction: At least once a month Operations: at least once per six months	CLO

Vulnerable Groups	Vulnerable groups will be invited and encouraged to attend the community meetings. If a group identifies a need to meet with the Project, the Project will organize an individual meeting with the person or particular group.	Project's management plans, community communications and community grievance mechanism	Construction: At least once a month Operations: at least once per six months	CLO
Civil Society and NGOs	Meetings or communication exchange by email or phone call	■ Identify their concerns regarding the Project's impacts and progress ■ Answer their questions regarding the Project ■ Receive feedback about the Project's management plans, community communications and Community grievance mechanism	Construction: At least bi-monthly Operations: at least once per six months	CLO

		■ Discuss collaboration opportunities (e.g. environmental and social programmes)		

Table 16: Consultation and Participation Plan

10) Key Performance Indicators

The Stakeholder Engagement Plan is to be reviewed on a six-month basis for the initial two years and then as necessary in consultation with key stakeholders.

Table 66 below presents the key performance indicators that will evaluate the implementation of this plan.

Impact	Indicator	Performance Goal/KPI	Project Phase	Method/Tool Frequency
Grievance Mechanism	Number of confirmed grievances by community	Total number reducing each year	Construction, Operations	External Grievance Database / Quarterly
	Number of confirmed grievances resolved in a timely manner	100%	Construction, Operations	External Grievance Database / Quarterly
	Audit the grievance mechanism to ensure implementation and that grievances are being adequately addressed	Every six months, the first two years, and then as necessary in consultation with stakeholders	Construction, Operations	Community Liaison Officer (CLO) / Yearly
Local Community & Stakeholders	Number of resolved incidents involving local community members	100% resolved incidents	Construction, Operations	Grievance Database and the CLO/ Quarterly

	Number of consultation and participation activities	100% reported meetings and activities, with evidence when possible	Construction, Operations	Stakeholder Engagement Database and the CLO/ Quarterly
	Type, materials and methods of Disclosure of Information	Cover 100% of the relevant topics as established in the Consultation and Participation Action Plan	Construction, Operations	Stakeholder Engagement Database and the CLO/ Quarterly
	Report back and feedback to the local community and stakeholders when needed (e.g. implementation of the grievance mechanism, conflicts solved and implemented solutions, etc.)	Delivery of reports to the community and communication channel chosen	Construction, Operations	CLO/ Quarterly
	Audit the stakeholder engagement activities	Every six months, the first two years, and then as necessary.	Construction, Operations	CLO / Yearly
Community Relations/ Staff/Team	The Project will monitor the number of new	Every six months.	Construction, Operations	CLO / Quarterly

	community relations staff and staff changes per period. This will be reported on the community engagement performance report.			

Table 17: Key Performance Indicators

11) Stakeholder Feedback and Documentation

Feedback from stakeholders will be solicited at every stage of the Project life cycle. For public meetings, comments will be recorded through detailed meeting minutes. The Community Liaison Officer for the Project will be responsible for recording any queries, concerns or complaints against the Project in a stakeholder engagement log which shall record all stakeholders, contact details, dates of engagement with comments and include follow-up requirements. Comments and decisions made on comments will be collated and reported back to stakeholders once the final decision on the course of action related to the comments has been made. Records will also be maintained on the methods used to inform stakeholders on dates and/or locations where they can gather project information and provide feedback.

Stakeholders will also be allowed to file complaints against the Project through the Grievance Redress Mechanism detailed in this ESMP. All records relating to this mechanism including grievance forms, grievance log, notes, interviews, meeting minutes, release forms, etc. will also be stored.

The Project's Environmental Safeguards and Health and Safety Specialist (ESHS Specialist) will capture stakeholder engagements in the Project's environmental reporting to be submitted to the Department of Environmental Planning & Protection on a bi-weekly basis.

The SEP is a living document that will be refined and modified throughout the life of the project and should be updated as needed.

Information derived from stakeholder feedback should be taken into consideration in construction design, methodology and operational management.

Stakeholders will be kept informed about the Project progress, including reporting on Project environmental and social performance, and implementation of the SEP and GRM. Information on stakeholder engagement activities undertaken by the Project may be conveyed to the stakeholders either by publication of a standalone annual report on the Project's interaction with the stakeholders, or via promotion through the Project Owner's or the Project's social media accounts (as established).

APPENDIX J: GRIEVANCE REDRESS MECHANISM

A grievance is a concern or complaint raised by an individual or group affected by the Project's activities. Grievances do not include a question or suggestion on the Project or request for assistance.

In order to ensure the implementation of the Project in a timely manner and effectively address any anticipated and unanticipated risks that would be encountered during implementation, including the development of the necessary actions of mitigation and avoidance, this Grievance Redress Mechanism (GRM) has been developed. The GRM will enable the Project Authorities to address any grievances against the Project.

Objectives of the GRM

The objectives of the GRM are as follows:

A. Address any negative environmental and social impacts of all Project activities.
A. Provide stakeholders with a clear process for providing comments and raising grievances.
B. Allow stakeholders the opportunity to raise comments/concerns anonymously.
C. Structure and manage the handling of comments, responses and grievances in a proportional manner, and allow monitoring of the effectiveness of the GRM.
D. Ensure a process that is inclusive and non-discriminatory (e.g. all grievances, from all community members regardless of age, ethnicity, mental or physical ability, race, religion, gender, sexual orientation or gender identity, will be accepted, reviewed, and solved as needed).
E. Mandate that the GRM is culturally appropriate and accessible (e.g. complaints can be filed in the local language(s), the technology required to file a complaint must be of common use, illiterate people can file complaints verbally).
F. Ensure that the process is free of charge and there is no cost to make a complaint.
G. Create transparency among stakeholders, including affected persons, by handling grievances in a fair, timely, impartial, confidential, and transparent manner, in line with internal policies and international best practice, and through an established communication system that ensures that stakeholders will be protected against retaliation for having raised complaints.
H. Bolster the relationship of trust among the Project team and stakeholders.

Roles and Responsibilities

The involvement of the people listed below is required to properly implement the GRM:

Role	Responsibilities

Community Liaison Officer (CLO)	Receiving and handling grievances. The CLO will coordinate the investigation and response to grievances as well as the ongoing monitoring and review of the effectiveness and efficiency of the grievance process.
Project Manager (PM)	Be familiarized with the GRM and provide the necessary resources to ensure its proper implementation.
Representative from Project Community	Review and approve the GRM; sit on the Grievance Redress Committee (GRC)
Grievance Redress Committee (to consist of, *inter alia,* PM, CLO, Legal Counsel, and Community Representative)	Receive, review, respond to, and supervise Level Two grievances
Employees, Contractors & Stakeholders	Read and be familiarized with the GRM

Table 18: GRM Roles and Responsibilities

Grievance Redress Process

The key stages involved in the Project's grievance redress process are described in the sections that follow.

Level One

A. Receive Grievance. A grievance can be received to the Project in any of the following ways:

- During regular meetings held between stakeholder and project representatives;
- During informal meetings with project representatives;
- Through communication directly with management – for example a letter addressed to site management, or other operational offices;
- Through Grievances boxes located in easily accessible locations such as community centres, health centres, police stations, etc. The precise locations of these boxes will be shared with the community during public consultation and other disclosure of information events;
- Directly by e-mail;
- Through social media platforms that will be established in respect of the Project;
- Through the Project website; and
- Through the CLO.

For grievances that have been submitted informally, the CLO will arrange for a meeting where the comment/grievance can be explained in full and written down on a grievance information form (Annex 1). For all comments the CLO will be the main point of contact, responsible for responding to the complainant.

B. Register Grievance. Once a grievance has been received it must be logged in the Project's Grievances Register (Annex 2).

C. Acknowledge Grievance. The stakeholder that lodged the initial grievance will be contacted by the CLO within 15 days by telephone, or in writing using the Grievance Acknowledgement Form (Annex 3) within 15 days of receipt. The complainant will be informed of the approximate timeline for addressing the complaint, if it can't be addressed immediately. The CLO will seek to ensure the speedy resolution of the grievance.

D. Investigate Grievance. If a comment or grievance requires further investigation, the Project will aim to complete the investigation within 15 days of the grievance first being logged.

Depending on the nature of the grievance, the approach and personnel involved in the investigation will vary. A complex problem may involve external experts. A simpler case may be easier, and quicker to investigate. The investigation will include, but will not be limited to, meetings with the complainant, site visits, meetings/interviews with Project staff and collection of relevant documentation and other forms of evidence.

The CLO will continually update the complainant on the progress of the investigation and the timeline for conclusion.

E. Resolve Grievance. The findings of the investigation should normally be completed within 25 working days of receipt of the grievance and notified to the complainant through the Disclosure Form (Annex 4). The Project will outline the steps taken to ensure that the grievance does not reoccur. If the grievance has been satisfied, then the PM should be included on the response.

Level Two

If the grievance has not been resolved, the CLO will inform the complaint of the existence of the GRC. The GRC shall dedicate days when they are available to receive and resolve complaints. Once the GRC receives a complaint it will register the complaint, investigate, and recommend and action within a 15-day period.

Level Three

If the complainant does not agree with the resolution at the second level, or there is a time delay of more than 60 working days in resolving the issue, the complainant can opt to consider taking it to the third level. This level involves the complainant taking legal recourse within the judicial system of The Bahamas.

Record Keeping

All comments, responses, and grievances are to be logged using the annexed Grievance forms and registers. This process shall include logging details of the grievance, the commenter/aggrieved, the steps taken to resolve the grievance and reference to any accompanying documentation, e.g. written statements, photographic evidence, or investigation report.

ANNEX 1 - GRIEVANCE INFORMATION FORM

Date Received	**Date: (dd-mm-yyyy):**	
Name of Grievant		□ You can use my name, but do not use it in public. □ You can use my name when talking about this concern in public. □ You cannot use my name at all.
Company (if applicable)		□ You can use my company name, but do not use it in public. □ You can use my company name when talking about this concern in public. □ You cannot use my company name at all
Contact Information	**Phone:** **Email address:** **Address:** (Kindly indicate the preferred method of communication)	
Details of grievance: (Who, what, when, where)	□ One-time incident/complaint □ Happened more than once (indicate how many times): _____	

	□ Ongoing (a currently existing problem)
How would you like to see issue resolved?	
Attachments to the grievance/complaint: (e.g. pictures, reports etc.)	List here:

Grievant/Complainant Signature	**Date (dd-mm-yyyy)**
Project Personnel Signature **(to confirm receipt only)**	**Date (dd-mm-yyyy)**

ANNEX 2 - GRIEVANCE REGISTER

No.	Name of Grievant/ Complainant	Date Received	Grievance Description	Name of Grievance Owner	Requires Further Intervention	Action(s) to be taken	Resolution accepted/not accepted & Date of acceptance/non - acceptance

ANNEX 3 - GRIEVANCE ACKNOWLEDGEMENT FORM

The project acknowledges receipt of your complaint and will contact you within 15 working days.

Date of grievance/complaint: (dd/mm/yyyy)	
Name of Grievant/Complainant:	
Complainant's Address and Contact Information:	
Summary of Grievance/Complaint: (Who, what, when, where)	
Name of Project Staff Acknowledging Grievance:	
Signature:	
Date: (dd/mm/yyyy)	

ANNEX 4 - DISCLOSURE/RELEASE FORM

Result of Grievance Redressal

Grievance No.	
Name of Grievant/Complainant	
Date of Complaint	
Summary of Grievance/Complaint	
Summary of Resolution	
Date of Grievance Resolution	

Grievant/Complainant Signature to confirm acceptance of Resolution

Date (dd-mm-yyyy)

Communications Liaison Officer Signature

Date (dd-mm-yyyy)

Project Manager Signature

Date (dd-mm-yyyy)