Environmental Protection Agency

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Environmental Permit (Varied)

Issued under the Environmental Protection Act, Cap. 20:05, Laws of Guyana, the Environmental Protection (Amendment) Act, 2005, and the Environmental Protection (Authorisations) Regulations, 2000.

Reference No.:	**20220201-GPLPG**
Fee:	**Extra Large (C2) - US$3100 per year**
Fees previously paid:	**US$ 15,500 for five (5) years – May, 2023 to April, 2028**
Fees paid:	**US$175 (Variance)**

Addressee: **Guyana Power and Gas Inc.**
116-117 Cowan Street, Kingston
Georgetown

Activity: Construction and Operation of 300 MW Gas Fired Power Plant

Guyana Power and Gas Inc., herein referred to as the "Permit Holder", is hereby authorised in accordance with the Environmental Protection Act, Cap 20:05, Laws of Guyana, Environmental Protection (Amendment) Act, 2005, and the Environmental Protection (Authorisations) Regulations, 2000, to construct and operate a 300 MW Gas-Fired Power Plant at Zone H1 Wales Developmental Zone, West Bank Demerara, Region Three (3), hereinafter referred to as "the Project", in a manner indicated in the Application dated september 13, 2023, subject to the terms and conditions set forth herein under the Environmental Protection Act, Cap. 20:05, existing and/or forthcoming regulations made under the said Act, and/or any applicable laws, best practices, directives, guidelines and standards relevant to this project.

The Permit Holder, his Servants, Agents and Sub-Contractors shall comply with the following Terms and Conditions of this Environmental Permit (Interim):

1.0 GENERAL

1.1 The Permit Holder shall make an application to the Agency to vary this Environmental Permit in instances where it becomes necessary to:

i. change the construction, operation, structure, or layout of the facility and all associated buildings;

ii. change equipment, machine, apparatus, mechanism, system or technology serving the facility;
iii. change the position and design of any outlet at the point or points of emissions or discharge of effluents; or
iv. affect any other change outlined in 20(3) of the Environmental Protection (Authorisations) Regulations.

1.2 The Permit Holder shall comply with all applicable laws, regulations and guidelines, including but not limited to the following:

a. Environmental Protection Act, Cap 20:05, Laws of Guyana;
b. Environmental Protection (Water Quality) Regulations, 2000;
c. Environmental Protection (Air Quality) Regulations, 2000;
d. Environmental Protection (Noise Management) Regulations 2000;
e. Environmental Protection (Hazardous Waste Management) Regulations, 2000;
f. Pesticides and Toxic Chemicals Act, No. 13 of 2000;
g. Pesticides and Toxic Chemicals Regulations, No. 8 of 2004 and associated Regulations;
h. Pesticides and Toxic Chemicals (Amendment) Regulations, No.8 of 2007;
i. Laws and regulations enacted by Guyana to implement the National Policy Framework;
j. International Conventions and Protocols;
k. Occupational Health and Safety Act, Cap 99:10, Laws of Guyana;
l. World Bank General Guidelines for Environmental Health and Safety, 2007

1.3 The Permit Holder shall apply to the Agency for Environmental Authorisation where new substation(s) at Garden of Eden and/or Golden Grove are to be established to allow for interconnection of the proposed power plant to the existing power grid at the Guyana Power and Light (GPL) facilities mentioned above.

1.4 The Permit Holder shall establish an Occupational Health and Safety (OSH)/ Environmental Department with suitably qualified and competent employees to implement and coordinate all safety requirements, and terms and conditions stipulated in this Permit, as well as compliance monitoring with the preparation of all required reports; and act as direct liaison with the Agency for all matters relating to compliance and monitoring.

1.5 The Permit Holder shall make all employees, and third parties under its direction, aware of the conditions of the Environmental Authorisation and provide training on good environmental practices.

1.6 The Permit Holder shall utilise the proposed location in accordance with the plan submitted to the Agency. All specifications of project location, pathways, reserve and boundary lines must be adhered to unless otherwise authorised; evidence of

which must be provided to the Agency.

1.7 The Permit Holder shall ensure that employees are at all times, equipped with appropriate protective gear during construction and operation such as protective headgear, respirators, safety vests, safety boots, etc.

1.8 Guyana Fire Service Approval shall be maintained annually and shall be submitted as a component of the Annual Report. The Permit holder shall maintain fire prevention and control equipment in accordance with the Guyana Fire Service Approval.

1.9 The Permit Holder shall seek and submit to the Agency within reasonable time, the requisite approvals from the Central Housing and Planning Authority (CH&PA), Guyana Power and Light (GPL) and any other authority with jurisdiction and oversight of the Project.

1.10 The Permit Holder shall submit an **Environmental Social Management Plan (ESMP)** to the EPA for approval **within six (6) months of the date of issuance of this Permit** for the construction and operation aspect of the project. The ESMP must comply with the following guidelines and must be informed by a comprehensive stakeholder engagement program:

1.10.1 The ESMP must incorporate an Emergency Response Plan (ERP) according to Condition 11.1. The ERP should clearly provide measures for its management to protect the surrounding environment and human health in emergency and non-emergency scenarios.

1.10.2 The ESMP must contain mitigation plans for all potential impacts of the project, including those on:

a. Water quality – the relevant features such as temperature, salinity, pH, colour, transparency, oil and grease, and organic material concentration measured by total organic carbon (TOC), (COD), (BOD), turbidity measured by suspended solids (SS); sanitation-related factors determined by measuring the amount of coliform bacteria, etc.
b. Air quality
c. Solid waste management
d. Socio-cultural resources

1.10.3 The ESMP must include a Comprehensive Environmental and Social Monitoring Plan (CESMP). This plan shall address the construction and the operation phases separately and should contain but may not be limited to the following:

a. A site plan or map detailing the GPS locations of final discharge point(s) for each effluent stream(s) generated,
b. Parameters to be analyzed;
c. Sampling locations to be monitored;
d. Schedules for monitoring and reporting;
e. Analytical methods;
f. A site map detailing the locations where emissions occur and the sampling and analytical methods to be used.
g. Site plan or map detailing the GPS coordinates of sampling locations for each emission stream(s) generated,
h. Parameters to be analyzed
i. Sampling locations to be monitored
j. Schedules for monitoring and reporting inclusive of ambient air quality, stack testing, fenceline monitoring of primary air contaminants and noise monitoring.

1.10.4 The ESMP must also include a Gas Leak Integrity Management Plan. This plan shall provide a detailed gas leak detection and repair program in order to control emissions by monitoring and implementing repairs immediately. Schedules for monitoring and reporting on gas leaks should be included.

1.11 The Permit Holder shall include the reporting schedule developed in the CESMP in its Annual Report Submission.

1.12 The Engineering Procurement and Construction (EPC) contractor shall be required to prepare and submit an environmental, health and safety action plan (EHSAP).

2.0 CONSTRUCTION

2.1 The Permit Holder shall ensure that construction activities are done in such a manner that will result in minimal impact on public health and the environment.

2.2 The Permit Holder shall ensure that safety-related signage, guardrails and warning tape are installed at construction sites.

2.3 The Permit Holder shall minimise any road traffic hazards or unnecessary inconveniences to the general public through appropriate planning and management of the construction site.

2.4 The Permit Holder shall not undertake construction works between 22:00 hrs and 06:00 hrs on any day unless prior approval is sought and granted from the Agency. This requirement does not apply to large concrete pours where work in the early morning and late evening is required.

2.5 The Permit Holder shall ensure all excavated materials are handled in such a way as to not negatively impact habitats or pose a significant hazard to human health and the environment.

2.6 The Permit Holder shall avoid, prevent and/or mitigate erosion, siltation and sedimentation of existing water bodies within the vicinity of the project site, as far as practicable.

2.7 The Permit Holder shall not discharge wastewater from washout and/or cleanout of bitumen, concrete, paint, and other construction materials into waterways unless appropriately treated.

2.8 The Permit Holder shall construct and maintain drainage systems capable of handling the probable maximum precipitation event. All internal drains within the Project shall be constructed of concrete

2.9 The Permit Holder shall keep drop heights at a minimum when loading and/or offloading materials e.g., sand, aggregates, etc. to reduce particles from becoming airborne.

2.10 The Permit Holder shall ensure stockpiles are stored downwind to avoid being transported by wind to sensitive areas. Loading and offloading activities should, as far as possible, also be confined to this location.

2.11 The Permit Holder shall employ dust suppression methods such as watering or erecting dust screens/fences to control dust emissions from material stockpiles and other components of the development that would generate dust.

2.12 The Permit Holder shall construct and maintain a septic system on site at all times. The septic tank should not be located within 1.5 m of a building or property boundary and should be accessible for cleaning and de-sludging. Any modification to the Septic tanks must be in accordance with the Guyana National Bureau of Standards (GNBS) Code of Practice for the Design and Construction of Septic Tanks and Associated Secondary Treatment and Disposal Systems.

3.0 OPERATION

3.1 The Permit Holder shall ensure that the Best Available Technology/ Technique (BAT) is used to achieve and maintain acceptable emissions and discharge standards in keeping with Conditions 5.3, 6.2, 6.8 and 6.10

3.2 The Permit Holder shall ensure that the heat rate of the Power Plant does not exceed 6200 BTU/MWh (1565Kcal/kWh) with an efficiency greater than 55% using General Electric or Siemens technology.

3.3 The Permit Holder shall ensure that power generation equipment and engines are operating in accordance with their optimal specifications. The equipment manuals should address all aspects of the ongoing operation, including the required maintenance and inspection schedule, monitoring/investigation procedures, emergency response, and requirements for review of the manual.

3.4 The Permit Holder shall ensure that power generation engines are placed on top of an impervious base so as to prevent the contamination of soil with fuel or waste oil.

3.5 The following records shall be maintained for all power generation engines identified for the Project.

a. Megawatt thermal input
b. Calorific value
c. Fuel-oil consumption

3.6 The Permit Holder shall establish a training schedule for employees and submit same to the EPA. This training schedule should include, but not be limited to, training in basic electrical theory, proper safety procedures, hazard awareness and identification, proper use of personal protective equipment, proper lockout/tagout procedures, first aid including Cardiopulmonary Resuscitation (CPR), and proper rescue procedures.

4.0 INCINERATOR

4.1 The Permit Holder shall operate and maintain the incinerator in accordance with the requirements outlined in the Incinerator Manual.

4.2 The Permit Holder shall conduct all treatment of oil sludge in accordance with the optimum operating criteria for the incinerator, specifically maximum and minimum temperature range, waste feed rate, residence time and burning capacity.

4.3 The Permit Holder shall adhere to the following provisions outlined in the Incinerator Manual:

a. The incinerator shall burn waste with a flashpoint of at least 60°C.
b. The incinerator shall not incinerate glass, metals, ceramics, electronic equipment, batteries, aerosols and explosive materials.
c. The incinerator shall not be exposed to river water spray or rain and it must not be hosed down.

4.4 The Permit Holder shall adhere to the International Maritime Organization's (IMO) specification for oil sludge outlined in the Incinerator Manual, being:

- 75% sludge oil from heavy fuel oil;

- 5% waste lubricating oil; and
- 20% emulsified water in mixing.

4.5 The Permit Holder shall take and analyse representative samples in a certified laboratory, on bi-annual basis, to verify compliance with the specifications stated at Condition 4.4.

4.6 The Permit Holder shall ensure the servicing and maintenance of the incinerator in accordance with the conditions outlined in the Incinerator Manual.

4.7 The Permit Holder shall ensure that a wet scrubber is installed and maintained on the Incinerator to minimise impacts of air emissions.

4.8 The Permit Holder shall ensure that automatic system alarms and/or trips are maintained for relevant operating parameters such as temperature, pressure, thermal oxidizer temperature, fan/air flow temperature, waste feed and condenser failure.

5.0 WATER AND SOIL QUALITY MANAGEMENT

5.1 The Permit Holder shall comply with the provisions of the **Environmental Protection (Water Quality) Regulations, 2000**.

5.2 Wells must be located at a safe distance from potential sources of contamination, such as septic systems, underground storage tanks, and industrial facilities.

5.3 Utilize approved well casing, screen and surface seal materials to prevent contamination and maintain structural integrity.

5.4 Wells must be regularly monitored for incidents of well failure, water quality issues and contamination incidents.

5.5 Monitor ground water levels and changes during construction and operation of wells. Modify extraction rates as necessary to prevent unacceptable adverse current and future impacts, considering future increases in demand.

5.6 Monitor the groundwater well for heavy metals, pH, Total Dissolved Solids (TDS), Nitrates once every five years and for bacteria on a bi-annual basis and ensure that the following parameters are in accordance with the World Health Organisation (WHO) Drinking Water Quality Standards (1993), Guidelines for potable water, not exceeding the limits shown in the following table:

Parameters **Heavy metals**	**WHO Standards (1993)** **mg/L**
Iron	0.3
Copper	2.0
Lead	0.01
Zinc	3.0
Manganese	0.4
Parameters to be tested	
pH	(6.0 - 8.5) pH units
Nitrates	50
Total Dissolved Solids (TDS)	500
Microbiological Parameters **Tested twice yearly**	**WHO Standards (1993)**
E. coli	0 count/100ml
Total coliform	0 count/100ml

5.7 Decommissioning procedures for the wells must be provided and adhered to if the wells are no longer in use.

5.8 Have an Emergency Response Plan in place detailing actions to be taken in the event of a well failure and contamination.

5.9 Submit the data required in condition 5.6 to the Agency as a component of the Environmental Annual Report required.

5.10 The Permit Holder shall maintain the integrity of the existing waterways at all times.

5.11 The Permit Holder shall ensure all effluent wastewater streams generated by the Project are treated to achieve the following indicative values prior to discharge. The

Permit Holder shall ensure that effluent streams comply with the World Bank guidelines for Effluent levels and applicable general International Finance Corporation (IFC) health and safety guidelines provided below.

Parameter	Units	Daily Maximum Concentration
pH	-	6-9
BOD	mg/L	50
Oil & Grease		10
Total Suspended Solids (TSS)		50
Cadmium		0.1
Total Residual Chlorine		0.5
Chromium		0.5
Copper		0.5
Iron		3.0
Zinc		1.0
Lead		0.2
Arsenic		0.5
Mercury		0.005
Temperature increases by thermal discharge from cooling system		The effluent should result in a temperature change of no more than 3°C above ambient conditions

5.12 The Permit Holder shall ensure that all untreated blow down water and wastewater to be removed from site via truck disposal is being done by an EPA permitted hazardous waste disposal service.

5.13 The Permit Holder shall ensure that all Gray and Black water (sewage) to be removed from the project site during construction and operation, is being removed by an EPA permitted waste disposal service.

5.14 The Permit Holder shall install sediment controls along site perimeter areas that will receive effluent and remove sediments before it accumulates to half of the above-ground height of the perimeter control.

5.15 The Permit Holder shall avoid soil and water contamination from fuel, grease, waste oils and other petroleum products that might be used at the facility.

5.16 The Permit Holder shall store fuel in a secured designated area to prevent accidental release into the surrounding environment, especially in rainy conditions. The designated area should not be within 100 m of surrounding water bodies.

5.17 The Permit Holder shall install a sump for the discharge of effluent from within the containment shall be installed. There shall be no release valve on the secondary containment.

5.18 The Permit Holder shall ensure that pipes from the pump are installed over the secondary containment and that effluents are discharged directly into the oil-water separator.

5.19 The Permit Holder shall ensure that fuel/lubricants including waste oils are not drained from the equipment onto the ground or into waterways.

5.20 The Permit Holder shall store all chemicals in leak-proof containers that are kept under water-resistant cover and surrounded by secondary containment structures (e.g., spill berms, decks, spill containment pallets) to minimize the potential discharge of chemicals in stormwater and external waterways.

5.21 The Permit Holder shall adequately store and/or cover temporary stockpiles of construction materials, excavated waste and fuel in a secured designated area to prevent accidental releases into the surrounding environment. The designated area should not be placed within 10 m of any water body.

5.22 The Permit Holder shall not discharge or dump solid waste and/or trade effluent directly into receiving waters without prior treatment.

5.23 The Permit Holder shall install and maintain grease trap(s)/ an oil-water separator(s) at the final discharge point of the onsite sewage facility through which all effluents must pass before final discharge.

5.24 The Permit Holder shall prevent excessive or inappropriate use of cleaning chemicals. The use of biodegradable/water-based cleaning products is encouraged.

5.25 The Permit Holder shall ensure that all steam, condensate, hot water and thermal fluid distribution pipework is insulated, down to and including 1" (25 mm) diameter pipe, in addition to insulating all hot valves and flanges.

5.26 The Permit Holder shall report the total volume of wastewater discharged from the Project site (cubic meters per year) in the Annual Report along with the volume of treated effluent(s) discharged on a monthly basis.

6.0 NOISE ABATEMENT AND AIR QUALITY MANAGEMENT

6.1 The Permit Holder shall comply with the **Environmental Protection (Air Quality) Regulations, 2000 and the Environmental Protection (Noise Management) Regulations 2000.**

6.2 The Permit Holder shall comply with the Guyana National Bureau of Standards (GNBS) *Guidelines for Noise Emissions into the Environment*. Sound levels from noise-making devices should not exceed the limits below, at a distance of 15 metres (50 ft) from the source or property boundary, whichever is closer.

- **Construction Limits: 90 dB** during the daytime (06:00 h - 18:00 h)
  75 dB during the night-time (18:00 h - 06:00 h)

- **Industrial Limits: 100 dB** during the daytime (06:00 h – 18:00 h)
  80 dB during the night-time (18:00 h – 06:00 h)

6.3 The Permit Holder shall ensure that all operational activities are done in such a manner so as to prevent, minimise, control and/or avoid noise disturbances.

6.4 The Permit Holder shall ensure that all sound-making devices, such as generators, engine exhaust and compressor components, are housed in enclosures, constructed with materials of good insulation properties (e.g., insulation boards, solid clay bricks, etc.), equipped with silencers/mufflers to reduce the noise level; and placed on foundations properly designed to ensure effective damping of vibrations. Adequate equipment maintenance must be done and any obsolete tools and equipment replaced. Install vibration isolation for mechanical equipment used during the operational period.

6.5 The Permit Holder shall, where possible, situate noise sources in less sensitive areas, utilise shields and distance noise disturbances from receptors.

6.6 The Permit Holder shall ensure that the exhaust stack of each generator is appropriately placed and extended to prevent impacts from soot or fumes affecting all relevant receptors.

6.7 The Permit Holder shall submit a report on annual Green House Gas (GHG) emissions using the Intergovernmental Panel on Climate Change (IPCC) approved methods. The report inclusive of Emissions Factors along with selected methodology should be submitted as part of the Annual Report.

6.8 Ambient air quality shall not exceed the following levels.

Pollutant	Averaging Time	WHO	Level

		(µg/m3
$PM_{2.5}$	1 year	10
	24 h (99th percentile)	25
PM_{10}	1 year	20
	24 h (99th percentile)	50
	1 year	
Nitrogen Dioxide (NO_2)	1 year	40
	1 hour	200
Sulphur Dioxide (SO_2)	24 hours	20
	10 mins	500
Ozone	8 hours, daily max	100
		NAAQS
Carbon Monoxide (CO)	8 hours	9ppm

6.9 The Permit Holder shall conduct visual monitoring of all stacks on site.

6.10 In the event of equipment malfunction or inefficiencies which may result in visible emissions to air for a period of more than six (6) minutes in one hour, the permit holder shall:

- investigate and undertake remedial action immediately;
- adjust the process or activity to minimise those emissions and
- record the events and actions taken

6.11 The Permit Holder shall conduct stack emission monitoring and testing and must be considered in the environmental and social monitoring plan required under condition 1.11.3. The permit holder shall propose for approval, the most practical and feasible method(s) of stack monitoring and testing to ensure that the following permissible levels of specific pollutants are met.

Air Pollutant	Maximum Permissible Level	Type of Monitoring
Carbon Monoxide	1000mg/m3	Stack
Oxides of Nitrogen	350mg/m3	Stack
Sulphuric Trioxides	100mg/m3	Stack
Particulate Matter	100mg/m3	Stack

6.12 NOx emission from each Gas Turbine shall not exceed 50ppm. Low NOx burner should be installed.

6.13 Noise levels emanating from turbines shall be so controlled using noise attenuation

devices so that the noise in the work zone is kept below 75dBA at 1m distance from the source of noise.

6.14 The Permit Holder shall record, investigate and address complaints of excessive noise, dust and vibrations from the public promptly upon receipt.

6.15 The Permit Holder shall implement a leak detection and repair (LDAR) program in order to control fugitive emissions by monitoring and implement repairs immediately.

6.16 The Permit Holder shall construct all Stacks in accordance with Good Engineering Practice Stack Height (HGEP) to avoid excessive ground-level concentrations of contaminants:
HGEP = H+ 1.5 L. Exit velocity of flue gases shall not be less than 22m/sec.

H_{GEP} = good engineering practice stack height, measured from the ground-level elevation at the base of the stack.
H =height of nearby structure(s) measured from ground-level elevation at the base of the stack.
L =lesser dimension, height (H) or projected width, of nearby structure(s).

Note: For projects where there are multiple sources of emissions, stack heights should be established with due consideration to emissions from all other point sources, both point and fugitive. Non-significant sources of emissions, including small combustion sources (total rated heat input capacity of 50MWth or less) should also use GIIP in stack design.

7.0 FLARING

7.1 Routine flaring and venting are strictly prohibited. Flaring is only permissible during commissioning, start-up or special circumstances, which for the purposes of this Permit, are defined as follows:

i. Commissioning shall be defined as the process of ensuring that all systems and components are designed, installed, tested, operated, and maintained according to the operational requirements or manufacturer's specifications. This condition shall also apply to the commissioning of any new units or systems post-production, or the renovation of existing units or systems, which may require flaring. During commissioning, all gas systems, must be properly installed, fully leak tested and able to receive gas, before start-up.

ii. Start-up shall be defined as the activity that occurs at the end of commissioning where production operations are initiated for the first time.

iii. Special Circumstances include only emergencies, maintenance and

restart which are defined as follows:

- Emergencies:

a. Controlled - any unavoidable expected event, including inclement weather conditions, strictly requiring the flaring of gas; and

b. Safety Response - any unplanned event requiring the flaring of gas for safety purposes or flaring required to maintain the flare system in a safe and ready condition (purge gas/make-up gas/fuel gas) and pilot flame.

- Maintenance:

a. Planned/unplanned maintenance and inspections on gas handling system and related processes, and construction activities.

b. Scheduled production testing, other evaluation testing, or the necessary blow down to perform these procedures; and maintenance required during and after an emergency shutdown or restart.

- Restart: the act of resuming production following a shutdown event."

7.2 The Permit Holder shall not exceed sixty (60) cumulative days of flaring during Start-up. For the purpose of this Condition, any day that gas is flared above background flare levels, regardless of the duration, is considered one (1) day of flaring.

7.3 The Permit Holder shall notify the Agency of the expected duration and flaring volumes expected during start-up and commissioning, respectively, at least six (6) months before start-up and commissioning, for its Approval.

7.4 The Permit Holder shall notify the Agency within twenty-four (24) hours of all special circumstances which result in a flaring event lasting more than twelve (12) hours.

7.5 With the exception of the background flare, where any of the abovementioned Special Circumstances is expected to exceed fourteen (14) calendar days, the Permit Holder shall seek Approval from the Agency for flaring within the first ninety-six (96) hours of the commencement of flaring.

7.6 Where flaring during Start-up is expected to exceed sixty (60) cumulative days, the Permit Holder shall seek an Approval from the Agency for flaring no later than five (5) calendar days prior to the end of the sixty (60) cumulative-day period.

7.7 When seeking an Approval under Condition 7.3, Condition 7.5 and Condition 7.6, the Permit Holder shall submit the following to the Agency:

a) a description of conditions which include, but may not be limited to, commissioning schedule, start-up schedule and maintenance schedule, where applicable;
b) schedule for flaring;
c) justification(s) for required approval; and

d) daily projected flare volumes.

Note: The Agency reserves the right to require the submission of such further information it deems necessary, before issuing an Approval for flaring. An Approval for flaring shall be subject to such terms and conditions as may be required by the Agency, including the strict adherence to Conditions 7.3, 7.5 and 7.6.

An Approval shall not be issued for a period exceeding sixty (60) calendar days. Where flaring exceeds or is expected to exceed the sixty calendar (60) day period, the Permit Holder shall seek an additional Approval at least forty-eight (48) hours before the expiration of the existing Approval, which additional Approval may be issued subject to such further terms and conditions as the Agency deems appropriate. The terms and conditions of any Approval for flaring shall be considered as forming part of the present Permit so that any breach or contravention thereof, shall be considered a breach or contravention of the Permit.

7.8 Prior to a flaring event, the Permit Holder shall:

a. ensure that flare equipment, gas handling system(s) and all combustion equipment are designed and built to API Standards and Recommended Practices;
b. ensure that flare equipment and gas handling system(s) are inspected, correctly installed, function tested, certified for use under operation conditions, and maintained in accordance with manufacturers' specifications, prior to start-up and throughout operations;
c. calibrate and maintain a flare metering system in accordance with the manufacturers' recommendations which calibration certificate must be submitted to the Agency upon completion of calibration;
d. ensure that the flaring stack is installed a safe distance from storage tanks and accommodation units;
e. minimize the risk of pilot flare blowout by ensuring sufficient exit velocity and providing wind guards;
f. determine the minimum exit velocity required to avoid pilot flare blowout and submit information to the Agency six (6) months before planned start-up;
g. operate the facility in a manner to keep overpressure events as low as practically possible and install high-integrity instruments and pressure protection systems to respond to overpressure events; and
h. implement burner maintenance and replacement programs in accordance with manufacturer's recommendations to ensure continuous maximum flare efficiency.

7.9 During a flaring event, the Permit Holder shall:

a. employ a metering system with an accuracy of plus or minus five (5) percent

to determine the quantity of gas to the flare system;

b. ensure that the flaring systems are being operated within manufacturers' recommended specifications;
c. use flare tip of a non-pollutant type, with low NOx emissions, and a burning efficiency high enough to support low hydrocarbon emissions to the atmosphere;
d. optimize the size and number of burning nozzles;
e. flare in a manner which controls odour and smoke emissions, where practicable;
f. ensure that the volumes of hydrocarbons flared and the estimated quantity of specific pollutants emitted from flaring including but not limited to carbon dioxide (CO_2), carbon dioxide equivalent (CO_2-e), nitrogen oxides (NOx), sulfur oxides (SOx), carbon monoxide (CO), particulate matter, hydrogen sulfide (H_2S), volatile organic compounds (VOCs), methane and ethane, benzene, ethyl benzene, toluene, and xylenes (BTEX), and glycols, and the methodology used to determine the concentration of each pollutant, are recorded and submitted to the Agency as a component of the Annual Report;
g. control and optimize flare operations to achieve maximum combustion efficiency;
h. minimize liquid carryover and entrainment in the gas flare stream with a suitable liquid separation system designed in accordance with API Standards and Recommended Practices;
i. equip liquid separation system (e.g., knockout drum) with high-level facility shutdown or high-level alarms and empty as needed to increase flare combustion efficiency; and
j. minimize flame lift off and/or flame lick.

7.10 After a flaring event, the Permit Holder shall maintain a consolidated record of all flaring events, regardless of size and duration, including begin times, end times and volumes, meter calibration and maintenance records commencing from commissioning and throughout the duration of the Permit.

8.0 FUEL HANDLING AND STORAGE

8.1 The Permit Holder shall establish and maintain a register of the types and quantities of fuel and associated hazardous materials stored onsite. A summary of the registered information shall be submitted to the Agency as a component of the Annual Report.

8.2 The Permit Holder shall main emergency spill clean-up kits at the project site for response to potential spills. Kits should contain absorbent materials, drain seals and other appropriate tools for clean-up.

8.3 Fuel shall at all times be kept above ground, away from ignition sources. 'No Smoking'

signs shall be posted where fuel is handled or stored.

Secondary Containment

8.4 The Permit Holder shall maintain an impervious secondary containment bund and have at least 110% containment capacity around all fuel storage tanks, creating a temporary holding area in the event of spillage. A width to height ratio of 3:1 is required for the bund to ensure the dike strength and durability.

8.5 The Permit Holder shall ensure the existing secondary containment around the fuel tank is inspected monthly for cracks and breakage to ensure they are liquid tight to withstand hydrostatic pressure of any contained liquid when full. A summarised inspection report shall be submitted to the Agency as a component of the Annual Report.

8.6 The Permit Holder shall ensure the containment bunds shall remain sealed and all piping must enter or exit the bund over the wall. Bunds shall provide total containment, and no part of the tank infrastructure (e.g., dispenser, filing hoses and valves) shall protrude outside the bund.

Note: Where it is not practical to provide permanent, dedicated containment structures for transfer operations, one or more alternative forms of spill containment should be provided, such as portable drain covers (which can be deployed for the duration of the operations), automatic shut-off valves on storm water basins, or shut off valves in drainage or sewer facilities, combined with oil-water separators.

Fuel Tank Maintenance

8.7 The Permit Holder shall ensure that fuel storage tanks are visually inspected to verify their integrity. A summarized inspection report shall be compiled and submitted to the EPA as part of the Annual Report.

8.8 The Permit Holder shall ensure that protection measures such as painting and coating is done in order to combat corrosion of the fuel tanks.

8.9 The Permit Holder shall maintenance and/or repair of fittings, pipes and hoses in accordance with the manufacturer's specifications. A summarised inspection report shall be compiled and submitted to the Agency as part of the Annual Report.

8.10 The following labels shall be posted on ALL fuel storage tanks in accordance with the Global Harmonization Standards (GHS):

a. The name of the fuel stored,
b. The tank capacity
c. Warning signs ("Danger", "no-Smoking", etc.)

Overfill Protection & Leak Detection

8.11 The Permit Holder shall install and maintain overfill protection on all fuel tanks. This may include an automatic shut off device or an audible or visible overfill alarm.

8.12 The safe fill level shall be clearly identified on the gauge and set at 90% to prevent overfilling. In the event of overfilling, all discharges shall be released into the containment bund.

8.13 The Permit Holder shall ensure that dispensing equipment shall be designed with the Best Available Technology (BAT) to minimise spills e.g., suction, pressure or gravity systems.

Fuel Transfer

8.14 The Best Available Technology/ Technique (BAT) shall be employed to capture fuel lost during the unloading of fuel to storage tanks and refueling of equipment.

8.15 The Permit Holder shall ensure that secondary containment, drip trays or other overflow and drip containment measures are installed and maintained at connection points or other possible overflow points.

8.16 A Standard Operating Procedure (SOP) for fuel transfer operations including a checklist of measures to follow during filling operations shall be established and maintained. A copy of this SOP shall be submitted to the EPA as a component of the Annual Report.

8.17 The Permit Holder shall ensure that all employees are trained on the SOP referred to at condition 8.16. An Annual training schedule shall be submitted to the EPA as a component of the Annual Report.

9.0 STORAGE OF CHEMICALS

9.1 The Permit shall ensure that chemicals used at the Project, such as Maxigard Corrosion Inhibitor, are stored in bunded/kerbed storage areas. This area shall satisfy the following requirements.

a. Low traffic
b. No floor drains
c. Bunded area which shall provide 110% containment of the largest volume stored therein.

9.2 The Permit Holder shall ensure that the Chemical Storage areas are clearly labelled, secured and well illuminated when not in use. The following warning signs shall be clearly posted:

a. "Hazardous Waste Storage Area"
b. Danger- "Authorized Personnel Only"
c. No Smoking

9.3 Where applicable, chemical storage areas shall possess ventilation in accordance with at least one of the following:

a. Gravity ventilation to the outside with a capacity of one cubic foot per minute per square foot or floor space
b. Mechanical ventilation with on/ off switches at points of ingress that are capable of exhausting to the outside.
c. Natural ventilation

9.4 The Permit Holder shall ensure that chemicals are stored away from ignition sources and in accordance with their hazard characteristics compatibility.

9.5 The Permit Holder shall ensure that chemicals are stored in containers appropriate for the waste stream, and in accordance with the following guidelines.

a) Sealed Plastic Containers
i. Water- based wastes
ii. Fountain Solutions, Pre- Press
b) Sealed Metal Containers
i. Solvents and Petroleum- based products
ii. Waste ink, Press-wash, Oil and Oily Absorbents

9.6 Chemical storage containers shall be labelled with the following:
a. The words "Hazardous Materials"
b. The type of chemicals
c. Beginning accumulation date- Date when the container was first placed in the Chemical Storage Area. Should the chemical storage container be reused, the date chemical was first placed in the container shall be recorded on the container.

9.7 Safety Data Sheets for all chemicals shall be readily available and easily accessible at all times at the Project.

9.8 The Permit Holder shall ensure that chemical storage containers remain closed during storage, except when it is necessary to add or remove such.

9.9 Chemical storage containers shall be inspected weekly for signs of leakage, deterioration or corrosion and damaged containers must be replaced immediately. Inspection reports must be maintained and signed by the appropriately qualified inspecting officer and his/her supervisor.

9.10 Chemical storage container inspection reports shall be summarised and submitted to the Agency as part of the Annual Report.

10.0 HAZARDOUS WASTE MANAGEMENT

10.1 The Permit Holder shall comply with the **Environmental Protection (Hazardous Waste Management) Regulations, 2000.**

10.2 The Permit Holder shall ensure that storage of chemical and hazardous waste management complies with the World Bank General Environmental Health and Safety Guidelines, 2007 and with the Good Industrial Practices (GIIP) outlined in the World Bank Guidelines for Thermal Power Plants, 2008.

10.3 The Permit Holder shall maintain good house-keeping, sanitary and hygienic practices and the aesthetic quality of the surroundings at all times.

10.4 The Permit Holder shall promote proper solid waste management and disposal practices at the facility. In particular, the Permit Holder shall dispose of waste at the nearest designated waste management site or contract a Disposal Service to dispose of waste at a legally designated site.

10.5 The Permit Holder shall ensure that garbage receptacles are covered and placed at strategic locations around the project site.

10.6 The Permit Holder shall ensure that domestic waste is placed in covered receptacles and disposed of by a competent disposal company/authority.

10.7 Reuse waste material where practical such as land-filling material for the revetment of the general compound surroundings. However, this must be done in an aesthetic and controlled manner.

10.8 The Permit Holder shall ensure that the surrounding environment is not littered with any form of wood, concrete, plastic, glass and metallic waste or any form of waste that will affect humans, flora and fauna and related biodiversity.

10.9 Dumping of waste into the surrounding environment, during the construction and operational phases, is strictly prohibited.

10.10 The Permit Holder shall prepare and submit to the Agency no later than forty-five (45) days after the end of the construction, a report relating to the activities for the previous year. The report shall include:

a. the name, location and type of facility;
b. types and quantities (in metric units) of hazardous waste generated;

c. manner of storage, use, any applied treatment standards/methods and disposal of these substances;
d. data concerning off-site shipments of waste, i.e., local disposal facility utilised, country to which hazardous waste is shipped, purpose of shipment and amount of waste shipped;
e. a summary of any accidents that may have occurred and any action taken; any waste minimisation efforts undertaken by your facility for hazardous material/waste; and any other matter the Agency may require.
f. any waste minimisation efforts undertaken by your facility for hazardous material/waste; and
g. any other information the Agency may require.

Note: The Agency considers all materials listed in Schedules I and II of the Environmental Protection (Hazardous Waste Management) Regulations, 2000, to be hazardous.

10.11 In the event that waste oil (recovered from the oil-water separator or from servicing of generators) is stored, the Permit Holder shall ensure that it is stored in a covered, bunded area to minimise adverse impacts to the environment in the event of spillage.

10.12 The Permit Holder shall ensure that all waste oil is disposed of in accordance with the Environmental Guidelines, 2011 for the 'Removal, Treatment and Disposal of Oily Sludge' or reuse waste oil as lubricant for chainsaw or other equipment/machinery.

10.13 The Permit Holder shall ensure that used oil/fuel containment absorbent materials are appropriately stored in a concrete-based structure and away from water ways and disposed by double wrapping in heavy duty garbage bags and disposed of at the incinerator on site or an approved hazardous waste disposal site.

10.14 The Permit Holder shall limit access to hazardous waste storage areas to employees who are authorised and have received proper training.

10.15 The Permit Holder shall record and include in a summary table the following information.
a. Name and description (e.g., composition of a mixture) of the hazardous materials;
b. Classification (e.g., code, class or division) of the hazardous materials;
c. Quantity of hazardous materials used per month; and
d. Characteristic(s) that make(s) the materials hazardous (e.g., flammability, toxicity).

10.16 The Permit Holder shall treat and contain all spills with absorbent materials.

10.17 The Permit Holder shall designate an area for the storage of the following:

Fuel.
First Aid Kit(s).
Washing detergents.
Sanitizers (J's Fluid, Pine Sol, etc.) for the facility.

10.18 The Permit Holder shall install secondary containment wherever liquid wastes are stored in volumes greater than 220 liters.

10.19 The Permit Holder shall ensure adequate ventilation where volatile wastes are being stored.

Reaction, Fire and Explosion Prevention

10.20 The Permit Holder shall store incompatible materials (acids, bases, flammables, oxidizers, reactive chemicals) in separate areas, and with containment facilities separating material storage areas.

10.21 The Permit Holder shall ensure that flame arresting devices are installed on vents from flammable storage containers.

10.22 The Permit Holder shall ensure that grounding and lightning protection equipment are installed for tank farms, transfer stations, and other equipment that handle flammable materials.

10.23 The Permit Holder shall ensure the storage of hazardous materials in an area of the facility separate from the main production works. Where closer proximity is unavoidable, physical separation shall be provided using structures designed to prevent fire, explosion, spills, and other emergency situations from affecting facility operations.

10.24 The Permit Holder shall prohibit all sources of ignition from areas near flammable storage tanks and ensure that signs are placed around this area.

10.25 The Permit Holder shall ensure that adequate safety measures are provided in the Power Plant area to check or minimize spontaneous fires.

11.0 EMERGENCY MANAGEMENT

11.1 The Permit Holder shall establish and maintain an ERP in keeping with GIIP. The ERP must include, but not limited to:

a. procedures to be followed in the event of Guyana Power and Gas Inc (Gas-Fired Power Plant) and/or pipeline malfunction;
b. the actions personnel must take to respond to fires, explosions, or any unplanned sudden or non-sudden release of hydrocarbon or hazardous waste

to air, soil, or water body;

c. systems for notification of national and local emergency response authorities and regulatory bodies;
d. the names and contact information of all persons qualified to act as emergency responders;
e. a list of all emergency response equipment at the facility (internal and external), including decontamination equipment, and a map showing where various equipment is located; and
f. an evacuation plan for facility personnel where there is a possibility that evacuation could be necessary. This plan must describe signal(s) to be used to begin evacuation, evacuation routes, and alternate evacuation routes (in cases where the primary routes could be blocked by releases of hazardous waste or fires), muster point(s), etc.

11.2 The Permit Holder shall ensure that at all times, the working environment is monitored for occupational hazards relevant to the specific construction activities of the facility.

11.3 The Permit Holder shall ensure that all employees must be equipped with and trained in the use of personal protective equipment (PPE) to fit their job specification such as hi-visibility vests, respirator, hard hats, gloves, and appropriate footwear and ensure appropriate utilisation of these gears. A log for the distribution of Personal Protective Equipment to employees must be maintained. Evidence of distribution log must be presented to officer of the Agency upon request during compliance inspections.

11.4 A First Aid Kit equipped according to the Guyana Red Cross standards must be on site at all times. Additionally, communication and transportation systems must be in place to respond to emergencies.

11.5 The Permit Holder shall ensure all employees are trained in firefighting protocol and the use of firefighting equipment, such as, fire extinguishers.

12.0 COMPLIANCE MONITORING AND REPORTING

12.1 The Permit Holder shall comply with any lawful directions given by the Agency from time-to-time in furtherance of the implementation of any international or other obligation for the environmental protection of Guyana.

12.2 The Permit Holder shall monitor the implementation of the Conditions of this Environmental Permit, insofar as they involve adherence by employees and all third parties under your direction.

12.3 The Permit Holder shall report to the Agency any non-compliance(s) with this **Environmental Permit:**

i. Within **twenty-four (24) hours** of the time the Holder of the Environmental Permit becomes aware of the non-compliance, the anticipated manner in which it may endanger human health or the environment.

ii. Within **seventy-two (72) hours,** submit to the Agency a written report containing a description of the non-compliance, its cause and the period of non-compliance including exact dates and time.

12.4 The Permit Holder shall submit a report to the Agency indicating the reasons for any non-compliance and the anticipated time it is expected to continue if not corrected.

12.5 The Permit Holder shall notify the Agency within **twenty-four (24) hours** of the occurrence of any environmental emergencies such as a sudden onset of disaster, accident, natural, technological or human induced factors that cause or threaten to cause severe environmental damage as well as harm to human health or livelihood.

12.6 The Permit Holder shall inform the Agency prior to or within **thirty (30) days** of any change of name or ownership of the project.

12.7 The Permit Holder shall notify the Agency within **twenty-one (21) days** in event of death, bankruptcy, liquidation or receivership of the Permit Holder or if the Company becomes a party to an amalgamation.

13.0 INSTITUTIONAL AUTHORITY/LIABILITIES

13.1 The Permit Holder shall be liable for any loss or damage to the environment intentionally or recklessly caused, through the discharge or release of any contaminant in any amount, concentration or level in excess of that prescribed by the regulations, stipulated by this Environmental Permit or directed by the Agency pursuant to the Environmental Protection Act, Cap. 20:05, Laws of Guyana.

13.2 The Permit Holder shall be responsible for any act which contravenes s. 39 (1), (2), (3) and (4) of the Environmental Protection Act, Cap. 20:05, Laws of Guyana. If found guilty, the Permit Holder shall be liable to the penalties prescribed under the said Act.

13.3 The Permit Holder shall compensate any Party who suffers any loss or damage as a result of the Project (See: s. 19 (3)(e) of the Environmental Protection Act, Cap. 20:05, Laws of Guyana).

13.4 The Permit Holder shall not be indemnified by the Agency for any activity that causes or is likely to cause pollution to the environment, resulting from adverse effects through the discharge, any contaminant in any amount, concentration, ultra-hazardous substances, chemicals or otherwise, and shall be rendered liable to prosecution and to penalties prescribed under the Environmental Protection Act and

Regulations.

13.5 The Permit Holder shall be liable of any negligence, gross negligence or willful misconduct caused by the Permit Holder, his Servants and/or Agents, to the environment, biodiversity, protected species and natural habitat with respect to any release, discharge, or spill, of contaminant fluids, oil or lubricants.

13.6 The Agency shall notify the Permit Holder immediately of any written claim or notice sent by any Complainant seeking loss or damage for negligence as a result of the Permit Holder's lack of due care or diligence.

13.7 Should the Permit Holder contravene or be likely to contravene any Condition of this Permit, the Agency (EPA) may serve on him an Enforcement Notice in accordance with Section 26 of the Environmental Protection Act, Cap. 20:05, Laws of Guyana.

13.8 Where it appears to the Agency that the Permit Holder is engaged in any activity that may pose serious threat to natural resources or serious pollution of the environment or any damage to public health, the EPA may issue to the Permit Holder a Prohibition Notice, which may order him to immediately cease the offending activity, in accordance with Section 27 of the Environmental Protection Act, Cap. 20:05, Laws of Guyana.

13.9 The Agency reserves the right to conduct regular inspections of the Permit Holder's construction and operations activities as part of its monitoring and enforcement requirements under the Environmental Protection Act, Cap 20:05, and the Environmental Protection (Amendment) Act, 2005, and Environmental Protection (Authorisations) Regulations, 2000.

13.10 The Permit Holder, His Servants and/or Agents shall at all times, allow entry to the permitted facility to any Officer designated by the EPA for the purposes of conducting inspections or any other legitimate business of the Agency. Pursuant to Section 38 of the Environmental Protection Act, Cap. 20:05, Laws of Guyana, it is an offence to **assault, obstruct or hinder** an authorised person in the execution of his/her duty under the said Act or its Regulations and the Permit Holder shall be liable to penalties prescribed under paragraph (c) of the Fifth Schedule for doing so.

13.11 The Agency shall have the right to cancel or suspend this Permit for breach of any of the terms and conditions contained herein.

13.12 This Environmental Permit is effective for the period stipulated herein, **May, 2023 to April, 2028**.

13.13 This **Environmental Permit** shall remain valid until **April 30, 2028,** unless otherwise suspended, canceled, modified or varied, in accordance with the provisions of this Permit or the Environmental Protection Act, Cap. 20:05, Laws of Guyana,

Environmental Protection (Amendment) Act, 2005, and the Environmental Protection (Authorisations) Regulations, 2000.

13.14 This Permit must be renewed by submitting an Application for Renewal of Environmental Authorisation to the Agency at least six (6) months before this Permit expires, that is, no later than **November 30, 2027.**

13.15 Any late submission of the application required by Condition 13.14 beyond the date specified therein, may require the Permit Holder to pay, in addition to the application fee, a late penalty fee (accruing at the time such obligation was first owed for renewal) at a rate of **two thousand dollars (GY$2,000.00) per day for every business day late,** until such application is submitted to the Agency, without prejudice to any other rights of the Permit Holder in connection therewith.

13.16 Failure to comply with the requirements of this Permit or with applicable laws, directive and regulations, whether existing or forthcoming, shall render the Permit Holder liable to prosecution and to penalties, inclusive of civil penalties, injunctive relief and imprisonment, as prescribed under the Environmental Protection Act, Cap. 20:05, Laws of Guyana, the Environmental Protection Regulations and other applicable laws of Guyana.

Signed by Shamfah Lazaick on behalf of the Environmental Protection Agency.

Environmental Protection Agency

Kemraj Parsram
Executive Director

Executive Director

Date 2023. 10.20

I hereby accept the above Terms and Conditions upon which this Environmental Permit is granted and agree to abide by the Environmental Protection Act, Cap.20:05, Laws of Guyana, the Environmental Protection (Amendment) Act, 2005, the Environmental Protection (Authorisations) Regulations, 2000, and any forthcoming regulations, best practices, guidelines and standards made under this Act.

NAME:	MICHAEL RON MUNROE
SIGNATURE:	
DESIGNATION:	DIRECTOR / COMPANY SECRETARY
DATE:	25/10/2023