



**Environmental
Protection
Agency**

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Environmental Permit (Varied & Modified)

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.:	20171204-ESSLP
Fees:	Extra Large (C1) – US \$ 15,500 (5 years) i.e. US \$3100 per year
Fees Paid:	USD \$15,500 (April 26, 2019 – April 25, 2024)

Addressee(s): **Mr Alistair Routledge**
President
Esso Exploration and Production Guyana Limited
86, Duke Street
Kingston
Georgetown
Guyana.

Activity: **Liza Phase 2 Development Project – Stabroek Block, Offshore, Guyana**

Esso Exploration and Production Guyana Limited (EEPGL), hereinafter referred to as the "Permit Holder", is hereby authorised by the Environmental Protection Agency (EPA) hereinafter referred to as the Agency, in accordance with the Environmental Protection Act, Cap 20:05, Laws of Guyana, the Environmental Protection (Amendment) Act, 2005, and the Environmental Protection (Authorisations) Regulations, 2000, to

undertake Phase 2 of the Liza Development Project, herein after referred to as the “Project”, which includes but is not limited to, drilling of subsea development wells, installation and operation of subsea equipment, use of a Floating Production, Storage, and Offloading (FPSO) vessel to process, store, and offload the recovered oil during production operations, within the Stabroek PPL, as well as the use of shorebase facilities and marine/aviation services to support these activities, in the manner indicated in the Application submitted on December 04, 2017, the approved Environmental Impact Assessment Report dated September, 2018, and the accompanying Environmental and Socio-economic Management Plan dated September, 2018, which includes the Wildlife Response Plan and Oil Spill Response Plan, and are subject to the terms and conditions set forth herein and in any existing or forthcoming regulations, best practices, guidelines and standards relevant to this project.

Environmental Permit, Reference Number 20171204-ESSLP, which was issued on April 26, 2019 and which is slated to expire on April 25, 2024, is hereby modified and varied in accordance with the Application for Variance of an Environmental Authorization submitted on October 7, 2021, deemed Environmental Permit (Modified & Varied) Reference Number 20171204-ESSLP, and issued pursuant to the Environmental Protection Act, Cap 20:05.

The Permit Holder shall comply with the following Terms and Conditions.

1.0 GENERAL

- 1.1 Comply with any directions of the Agency where compliance with such directions is necessary for the implementation of any obligations of Guyana under any treaty or international law related to environmental protection.
- 1.2 Restore or rehabilitate the environment to an acceptable state after any impacts resulting from any breach of the conditions of this Permit.
- 1.3 Comply with the approved Liza Phase 2 Environmental Impact Assessment, Environmental and Socioeconomic Management Plan and Oil Spill Response Plan.
- 1.4 Comply with any forthcoming guidelines, standards, best practices and the National Oil Spill Contingency Plan.
- 1.5 The Permit Holder shall submit **within one (1) year** of issuance of this Permit an updated Liza Phase 2 Environmental and Socioeconomic Monitoring Plan, including protocols, performance standards, and responsibilities in Consultation with and jointly implemented by the Permit Holder and the Agency. Capacity (e.g. training) within the EPA shall be supported by the Permit Holder where



necessary and practicable. External expertise (local and international) may be sourced by the EPA as may be required to augment this monitoring plan and/or conduct associated audits. The Permit Holder will be responsible for all reasonable and jointly agreed upon costs associated with this monitoring plan and its implementation, and any associated independent audits.

1.6 The Permit Holder shall notify the Agency in writing and obtain its approval for **ANY** proposed changes to the operation at least **21 calendar days** prior to making the change.

1.6.1 The notification shall contain a description of the proposed change in operation. It is not necessary to make such a notification if an application to vary this permit has been made and the application contains a description of the proposed change. In this condition 'change in operation' means a change in the nature or functioning, or an extension, or any additional installation, which may have consequences for the environment. Changes to operation may include but not be limited to the following:

- i. Changes in vessels, equipment, or technology;
- ii. Installation of new and/or changes (excluding routine maintenance) to equipment, machine, apparatus, mechanism, system or technology serving the facility or operation; or
- iii. Any change of technology used or installed at the facility from which effluents may be discharged or any changes in the nature, composition, concentration or quantity of the discharge.

1.7 Comply with all applicable laws and regulations, including but not limited to the following:

- i. Environmental Protection Act, Cap 20:05, Laws of Guyana and associated Regulations;
- ii. Petroleum Exploration and Production Act, 1986;
- iii. Petroleum Exploration and Production (Amendment) Act, 1992;
- iv. Pesticides and Toxic Chemicals Act, No. 13 of 2000;
- v. Pesticides and Toxic Chemicals Regulations, No. 8 of 2004;
- vi. Pesticides and Toxic Chemicals (Amendment) Regulations, No.8 of 2007;
- vii. All applicable policies, laws and regulations of Guyana; and
- viii. International conventions and protocols

1.8 The best available techniques and technologies which consider economic and technical feasibility, as well as the facilities and controls described in the EIA, shall be used to prevent or mitigate pollution in relation to any aspect of the operation, which is not regulated by any other condition of this Permit.

1.9 The Permit Holder shall use an effective Environmental Management System with policies and procedures for environmental compliance and improvements, and shall perform internal audits on at least an annual basis. The Permit Holder

shall share the results of the internal audits with the Agency. The Agency at its discretion may require other independent environmental audits, in accordance with applicable International Conventions and Protocols during the course of this Permit.

- 1.10 Employ effective operational and maintenance systems on all aspects of the facility whose failure could impact the environment. A schedule of maintenance of all vessels, equipment, and/or plant shall be kept on site and made available for inspection on request from the Agency. Maintenance shall be carried out in accordance with the relevant manufacturer's specification.
- 1.11 Comply with the following Legislation/Guidelines/Conventions as indicated under 3.0 Administrative Framework as well as Section 6, 7, and 8 in the Environmental Impact Assessment, dated September 2018, and under the following headings:
 - i. Environmental Protection Act, Cap.20:05, Laws of Guyana;
 - ii. National Legal Framework;
 - iii. Environmental Permits and Licenses;
 - iv. Laws and regulations enacted by Guyana to implement the National Policy Framework;
 - v. International Conventions and Protocols; and
 - vi. EEPGL's Operations Integrity Management System

2.0 NOISE MANAGEMENT

- 2.1 Where practicable, ensure that sound-making devices or equipment are equipped with silencers or mufflers and are enclosed, and/or utilise soft-start procedures (e.g., pile driving, vertical seismic profiling activities, etc.) to reduce noise to levels that do not cause material harm or injury to marine species.
- 2.2 Implement engineering controls, administrative controls and training to protect offshore workforce from high noise levels in offshore work environment.

3.0 AIR QUALITY MANAGEMENT

- 3.1 Annually quantify aggregate greenhouse gas (GHG) emissions from all offshore facilities and all offshore and onshore support activities conducted by Permit Holder or its dedicated contractors in accordance with internationally recognized methodologies.
- 3.2 Implement internationally recognized methods for controlling and reducing fugitive emissions in the design, operation, and maintenance of offshore facilities and onshore support activities conducted by the Permit Holder or its dedicated contractors to maximise energy efficiency and design facilities for lowest energy use. The overall objective is to reduce air emissions.

- 3.3 Operate all mechanical equipment in accordance with the manufacturer's specifications. Additionally, ensure that mechanical equipment, vehicles, vessels and helicopters, utilised during Project works, are regularly maintained and operated at their optimal levels to minimise atmospheric emissions.
- 3.4 Utilize low sulphur fuels for major vessels, where available and commercially viable.
- 3.5 Routine flaring and venting is strictly prohibited (except for background flare streams which include low pressure streams; flaring required to maintain the flare system in a safe and ready condition including pilot gas; tank flashing emission; and standing/working/breathing losses) during any developmental drilling or production activities. Flaring is only permissible under the following conditions: Commissioning, Start-up, or Special Circumstances, as defined below:
- 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. 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, regardless of the duration, is considered one (1) day of flaring.
 - iii. **Special Circumstances:**
 - a. Emergencies:
 - i. Controlled - any unavoidable expected event, including inclement weather conditions, strictly requiring the flaring of gas; and
 - ii. 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.

- b. Maintenance:
- i. Planned/unplanned maintenance and inspections on gas handling system and related processes, and construction activities.
 - ii. Scheduled unloading or cleaning of a well or well work-over, well testing, production testing, other well-evaluation testing, or the necessary blow down to perform these procedures; and maintenance required during and after an emergency shutdown or restart.
- c. Restart: the instance of resumption of FPSO operations following a shutdown event.
- 3.5.1 Where any of the abovementioned Special Circumstances conditions is expected to exceed **fourteen (14) calendar days**, the Permit Holder shall seek an Approval from the EPA for flaring **within the first ninety-six (96) hours** of the commencement of flaring. Where flaring during Start-up is expected to exceed sixty (60) cumulative days, the Permit Holder shall seek an Approval from the EPA for flaring no later than **five (5) days** prior to the end of the sixty (60) cumulative-day period.
- 3.5.2 When seeking an Approval under Condition 3.5.1, the Permit Holder shall submit the following to the EPA:
- i. Description of conditions which includes but is not limited to commissioning schedule, start-up schedule, and/or maintenance schedule; where applicable;
 - ii. Detailed schedule for flaring;
 - iii. Justification(s) for required approval; and
 - iv. Daily projected flare volumes.
- 3.5.3 The Agency reserves the right to require the submission of such further information it deems necessary, before issuing an Approval for flaring.
- 3.5.4 An Approval for flaring shall be subject to such terms and conditions as may be required by the EPA, including the strict adherence to Conditions 3.6, 3.7 and 3.8.
- 3.5.5 An Approval shall not be issued for a period exceeding **sixty calendar (60) days**; noting where flaring exceeds or is expected to exceed the sixty days period, the Permit Holder shall seek an additional Approval **at least forty-eight (48) hours** before the expiration of the current Approval,

which may be issued subject to such further terms and conditions as the Agency deems appropriate.

Any Approval for flaring shall be treated as an extension of the Environmental Permit and any breach or contravention thereof, shall be considered a breach or contravention of the Permit.

- 3.6 The Permit Holder shall pay **US\$45 per tonne** of carbon dioxide equivalents (CO₂e) emitted as a result of flaring in excess of the periods of flaring expressly stipulated at 3.5(ii) and 3.5.1 above, which shall be calculated based on the CO₂ equivalent (CO₂e) emitted.
- 3.7 The Permit Holder shall submit CO₂e payment calculations within **twenty-eight (28) days** from the date of expiration of the Approval granted by the EPA. CO₂e emission payments shall be made payable to the EPA within **fourteen (14) days** of the EPA's approval of the CO₂e payment calculations.
- 3.8 Nothing contained herein shall be interpreted to mean the EPA rescinds its authority to revise the rate of **US\$45 per tonne** established by Condition 3.6 for the emission of CO₂e for any period of continuous flaring beyond sixty (60) days; to order the cessation of all flaring through the issuance of a Prohibition Notice, pursuant to Section 27 of the Environmental Protection Act, Cap. 20:05; or any other course of action provided by the Environmental Protection Act and Regulations.
- 3.9 Greenhouse gas (GHG) emissions, including CO₂ and CO₂e emissions, from gas flaring activities must be estimated based on sound engineering mass and energy balance calculation, and accurate data. Therefore, GHG emissions shall be estimated based on the most recent updated versions of the following approved methodologies:
 1. American Petroleum Institute's (API) Compendium of Greenhouse Gas Emissions Methodologies for the Oil and Gas Industry;
 2. Intergovernmental Panel on Climate Change (IPCC) Guidelines for National Greenhouse Gas Inventory;
 3. U.S. Code of Federal Regulations (CFR), Title 40 – Protection of the Environment, Chapter I – Environmental Protection Agency , Subchapter C – Air Programs, Part 98 – Mandatory Greenhouse Gas Reporting, Subpart W – Petroleum and Natural Gas Systems (USEPA 40CFR98.233 – Calculating GHG Emissions); or
 4. Any other equivalent standard/document approved by the EPA.

Considerations made to calculate the quantity of GHG emissions must be summarized and reported to the EPA.

- 3.10 Notify the Agency within **twenty-four (24) hours** of all process upset events or unplanned maintenance occurrences which result in a flaring event on the FPSO lasting more than **twelve (12) hours**.
- 3.11 Ensure that associated gas brought to the surface with crude oil during oil production is re-injected into the reservoir, utilized as fuel gas on the FPSO, and/or exported to shore to a processing facility. The Permit Holder shall seek permission in writing from the Agency for any alternative use of associated gas.
- 3.12 Adopt risk assessment processes (e.g. hazard and operability study (HAZOP), hazard identifications study (HAZID), etc.) to assess risks associated with process upset and loss-of-containment events which could impact the environment.
- 3.13 Adopt measures as far as practicable in keeping with the Global Gas Flaring and Venting Reduction Partnership when considering venting and flaring options under emergency or upset conditions.
- 3.14 The following conditions should be complied with when flaring from the FPSO is necessary, particularly under emergency and/or upset conditions:
- i. Flare equipment shall be properly inspected, well maintained, monitored, certified and function/tested, prior to and throughout operations;
 - ii. Install flare at a safe distance from storage tanks containing flammable liquids or vapours and accommodation units;
 - iii. Combustion equipment shall be designed and built to appropriate engineering codes and standards certified. Flare must not be operated outside design operating ranges;
 - iv. Use efficient flare tips and optimise the size and number of burning nozzles;
 - v. Minimise risk of pilot blowout by ensuring sufficient exit velocity and providing wind guards;
 - vi. Utilize a reliable pilot ignition system;
 - vii. Install high-integrity instrument pressure protection systems, to reduce overpressure events and avoid or reduce flaring situations;
 - viii. Operate flare to control odour and visible smoke emissions;
 - ix. Record volumes of hydrocarbons flared and submit a copy of the record to the Agency annually;
 - x. Implement burner maintenance and replacement programs to ensure continuous maximum flare efficiency;
 - xi. Maximise flare combustion efficiency by controlling and optimizing flare fuel, air, and stream flow rates to ensure the correct ratio of assist stream to flare stream;
 - xii. Minimise liquid carryover and entrainment in the gas flare stream with a suitable liquid separation system, with sufficient holding capacity for

- liquids that may accumulate and which must be designed in accordance with good engineering practice;
- xiii. Equip liquid separation system (e.g., knockout drum) with high level facility shut down or high level alarms and empty as needed to increase flare combustion efficiency.
 - xiv. Implement source gas reduction measures (i.e., gas re-injection into reservoir) to the extent possible to avoid or reduce flaring from FPSO.
 - xv. Minimise flaring from purges and pilots without compromising safety through measures such as installation of purge gas reduction devices, vapour recovery units, inert purge gas, and soft seat valve technology where appropriate, and installation of conservation pilots.
 - xvi. Minimise flame lift off and/or flame lick.
 - xvii. Ensure the volumes of hydrocarbons flared are recorded and submitted to the Agency in a monthly report and the estimated quantity of specific pollutants emitted from flaring including but not limited to carbon dioxide (CO₂), carbon dioxide equivalent (CO₂-e), nitrogen oxides (NO_x), sulfur oxides (SO_x), carbon monoxide (CO), particulate matter, hydrogen sulfide (H₂S), volatile organic compounds (VOCs); methane and ethane; benzene, ethyl benzene, toluene, and xylenes (BTEX); and glycols, polycyclic aromatic hydrocarbons (PAHs) must also be reported.
- 3.15 In the event of an emergency or equipment breakdown on the FPSO, or when facility upset conditions arise, excess gas should not be vented but rather should be sent to an efficient flare gas system.
- 3.16 Develop equipment strategies and execute a maintenance programme to minimise equipment breakdowns and plant upsets which could result in flaring and provisions should be made for equipment sparing and plant turn-down protocols where practical.
- 3.17 Avoid use of chlorofluorocarbons (CFCs) and polychlorinated biphenyls (PCBs) on the FPSO.
- 3.18 Implement inspection, maintenance and surveillance programs to identify and prevent unplanned emissions to atmosphere onboard the FPSO.
- 3.19 Implement the following measures in the event well testing has to be conducted:
- i. During well testing, only the minimum volume of hydrocarbons required for the test should be flowed and well-test durations should be reduced to the extent practical. An efficient test flare burner head equipped with an appropriate combustion enhancement system should be selected to minimise incomplete combustion, black smoke, and hydrocarbon fallout to the sea;
 - ii. Record volumes of hydrocarbons flared and make available to the Agency upon request;

- iii. Provide adequate gas sensors that are to be appropriately located during testing operations, to ensure all sources of gas can be detected;
- iv. Monitor pipes and joints on a daily basis for leakages and fugitive emissions. Additionally, all collected gaseous streams should be burned in high efficiency flare(s), and leak detection and repair programs should be implemented and maintained;
Install an efficient test flare burner head equipped with an appropriate combustion enhancement system which should be selected to minimise incomplete combustion, black smoke, and hydrocarbon fallout to the sea;
- v. Well test shall be kept to the minimum practical time, in keeping with pre-approved schedule between the Agency and Permit Holder. Also, notify the Agency immediately in case of any deviation / variation to the well test; and
- vi. Provide sufficient compressed air to oil burner for efficient flaring assignment.

4.0 WATER QUALITY MANAGEMENT

- 4.1 Marine discharges from well drilling, hydrostatic testing of flow lines and risers, and the overall production operations shall be undertaken in a manner that does not cause or permit the entry of contaminants into the environment in amounts, concentrations or levels in excess of that prescribed by the regulations or stipulated by any environmental authorisation.
- 4.2 Notify the Agency in writing of any change in the type of drilling fluid used, disposal/recycle/treatment method outlined.
- 4.3 Submit upon receipt, a copy of the FPSOs International Sewage Pollution Prevention Certificate along with a copy of the Certificate of Type Approval for Sewage Treatment Plants and associated appendices.
- 4.4 Discharges of pollutants/contaminants in coastal waters (i.e., twelve (12) nautical miles) in amounts, concentrations or levels in excess of that prescribed by the regulations or stipulated by any environmental authorisation are prohibited.
- 4.5 Visually check and take appropriate measures to mitigate occurrence of free oil resulting from discharge of NADF drill cuttings.
- 4.6 Maintain an inventory of all drilling fluid constituents added downhole for each well.
- 4.7 Produced water from the reservoir shall be treated onboard the FPSO to an acceptable specification prior to discharging. The oil content specification of produced water to be discharged shall not exceed 42 mg/L on a daily basis or 29 mg/L on a monthly average. If the oil content of produced water is observed to exceed these limits, the produced water shall be routed to an appropriate storage

tank on the FPSO until further treatment system is restored, and the discharge meets the specification above.

- 4.8 The use of fluids that contain diesel as the principal component of the drilling mud liquid phase is prohibited.
- 4.9 For well sections requiring non-aqueous drill fluid (NADF), use only low-toxicity International Oil and Gas Producers (IOGP) Group 3 base fluid.
- 4.10 Use solids control and cuttings dryer systems to treat cuttings such that end of well maximum weighted mass ratio averaged over all well sections drilled using non-aqueous fluids shall not exceed 6.9 percent wet weight base fluid retained on cuttings.
- 4.11 Antifouling chemical dosing to prevent marine fouling of offshore facility cooling water systems shall be carefully considered. Available alternatives should be evaluated and, where practical, the seawater intake depth should be optimised to reduce the need for use of chemicals. Appropriate screens should be fitted to the seawater intake, if safe and practical, to avoid entrainment and impingement of marine flora and fauna.
- 4.12 The cooling water discharge should be designed to ensure that the temperature is within 3°C of ambient seawater temperature at 100 meters.
- 4.13 Monitor temperature of FPSO cooling water discharges to ensure a temperature rise of no more than 3°C above ambient water temperatures at 100 m.
- 4.14 Abide with the International Maritime Organization (IMO) Guidelines including the International Convention for the Control and Management of Ship's Ballast Water and Sediments (2004), with the exception of Regulation D-2 (Ballast Water Performance Standard) while the FPSO is on station, and abide with the International Convention for the Prevention of Pollution from Ships (MARPOL).
- 4.15 Adhere to operational controls regarding material storage, wash-downs and drainage systems.
- 4.16 Treat bilge water in accordance with MARPOL to ensure compliance with an oil in water content of <15 ppm as applicable.
- 4.17 Ensure there is no visible oil sheen from commissioning-related discharges (i.e., flowlines/risers commissioning fluids, including hydrotesting waters) or FPSO cooling water discharge.
- 4.18 Prohibit the discharge of drilling fluids, which contain used/waste engine oil, cooling oil, gear oil or lubricant, and which has previously been used for purposes other than borehole lubrication.

- 4.19 Prohibit the discharge of cuttings generated using drilling fluids, which contain conventional mineral oil (IOGP Group 1), except when the mineral oil is used as a carrier fluid (transporter fluid), lubricity additive, or pill.
- 4.20 Discharge of diesel oil, halogenated phenol compounds, or chrome lignosulfonate is prohibited.
- 4.21 Wastewater that is released from the onboard Sewage Treatment Plant, when sampled three times or more over 24 hours, shall comply with the aquatic discharge standards in accordance with MARPOL 73/78 regulations.
- 4.22 Macerate food waste in accordance with MARPOL prior to discharge.
- 4.23 Measure residual chlorine concentration of treated sewage discharges on FPSO monthly to ensure that it is below 0.5mg/L in accordance with MARPOL 73/78 regulations; keep log of results and submit in the quarterly compliance report.
- 4.24 Safety management system onboard shall include steps for regular checks and maintenance of the sewage plant check pipes, storage tanks, and other equipment as per manufacturer's instructions; checks and maintenance of the sewage plant and other equipment should be logged and documented for the annual compliance report.
- 4.25 Inform the Agency in the event that wastewater from the sewage treatment plant is diverted to the oily/bilge water separator providing the reasons for this occurrence, its duration, the quantity diverted and actions taken to resolve the issue should be provided. Further, any discharge from the oily/bilge separator in this occurrence should be in accordance with Annex IV of MARPOL.
- 4.26 Perform daily visual inspections on the FPSO of discharge points to ensure that there are no floating solids or discolouration of the surrounding waters and document observations provide same in the quarterly compliance report.
- 4.27 Ensure that leak detection mechanisms are in place for those equipment, treatment and storage facilities (fuel, chemical, etc.) on the drillship in accordance with international offshore petroleum industry standards.
- 4.28 Utilize leak detection controls during FPSO offloading (e.g., for breach of floating hose, instrumentation / procedures to perform volumetric checks).
- 4.29 Utilize leak detection controls during installation and operation of SURF equipment (e.g., pigging and pressure testing of lines, periodic ROV surveys of subsea trees, manifolds, flowlines and risers).

5.0 HAZARDOUS AND NON-HAZARDOUS WASTE & MATERIALS MANAGEMENT

- 5.1 Adhere to the provisions of the Environmental Protection (Hazardous Waste Management) Regulations, 2000.
- 5.2 Ensure effective management of waste and recoverable materials generated by the project in accordance with internationally acceptable standards and the Environmental Protection Act, Cap. 20:05, Laws of Guyana.
- 5.3 Dispose of all wastes in accordance with the Waste Management Plan and individual vessel Garbage Management Plans.
- 5.4 Waste management companies contracted by the Permit Holder to manage waste which includes collection transportation, storage, treatment and disposal shall be authorized by the Agency.
- 5.5 Maintain a high level of housekeeping, sanitary and hygienic practices, and environmental standards of all facilities, vessels and associated structures at all times.
- 5.6 Operate incinerators in accordance with the Manufacturer's Operating Manuals and Waste Management Plan. Ensure that the incinerators are operated only by trained personnel.
- 5.7 Perform periodic inspections of the FPSO's waste storage areas and containers and maintain an inspection log.
- 5.8 Maintain an inventory of wastes stored aboard the FPSO and Drill Ship.
- 5.9 Maintain a record of hazardous materials used in operation and submit in the Annual Report a summary table with the following information:
 - (a) Name and description;
 - (b) Classification e.g. code or class;
 - (c) Quantity used per month; and
 - (d) Characteristic(s) that make(s) the material (s) hazardous e.g. flammability, toxicity.
- 5.10 Maintain copies of waste manifests and chain of custody forms.
- 5.11 Transport of hazardous waste offsite for treatment and/or disposal MUST be accompanied by a manifest signed by the hazardous waste generator and transporter; the manifest must be provided within the Annual Report, as well as, submitted to the Agency electronically and should include the name and address of waste generator; name and description of the waste and hazard class; number and type of containers; quantity transported and name and address of receiving facility.

- 5.12 Periodically audit waste contractors to verify appropriate waste management practices are being utilized.
- 5.13 Utilise low toxicity chemicals/materials where practical. Each chemical/material should be managed in accordance with the associated Safety Data Sheet.
- 5.14 Implement best practices outlined in the IFC Environmental, Health and Safety (EHS) General Introduction Guidelines and Offshore Oil and Gas Development Guidelines with respect to the prevention of spills of hazardous materials from offshore facilities during chemical transfers and loading activities.
- 5.15 Radioactive sources will be returned to their supplier and radioactive wastes will be sent, according to the Waste Management Plan, to a facility permitted to manage such wastes.
- 5.16 The Agency considers all materials listed in Schedules I and II of the Environmental Protection (Hazardous Waste Management) Regulations, 2000, to be hazardous. Please see attached list of Hazardous Wastes to be controlled.
- 5.17 Fuel, oils and chemicals shall be appropriately secured and contained in accordance with their Material Safety Data Sheet.
- 5.18 Submit the types and quantities of chemicals stored in offshore facilities as part of reporting requirements stipulated in Condition 11.5 of this Permit.
- 5.19 Spent oils, lubes and chemicals that cannot practically and safely be recycled through the FPSO process will be sent to shore for disposal in a manner approved by the EPA. Disposal of used/waste oils and chemicals in the marine environment or in any waterways is prohibited, as well as, disposal onshore if untreated.

6.0 SEISMIC-RELATED ACTIVITIES

- 6.1 Notify the Agency in writing of the intent to commence seismic-related activities (e.g., Vertical Seismic Profiling (VSP), site investigations or monitoring surveys) in the Liza Phase 2 Area of Interest at least **thirty (30) days** in advance of commencing activities.
- 6.2 Employ trained Marine Mammal Observers (MMOs) during the conduct of seismic-related activities (e.g., at least one trained MMO for VSPs or at least two trained MMOs for other seismic surveys requiring more than 12 continuous hours of observation per day).
- 6.3 Conduct a continuous observation of a mitigation zone (500 metres around a sound source) to verify whether it is clear of marine mammals and marine turtles before commencing sound producing seismic operations.

- 6.4 Sound producing seismic operations (including soft starts) shall not commence if marine mammals or turtles are sighted within the mitigation zone during the 30 minutes prior to commencing sound producing operations in water depths less than 200 metres, or 60 minutes prior to commencing sound producing operations in water depths greater than 200 metres.
- 6.5 Adhere to the Joint Nature Conservation Committee (JNCC) Guidelines (2017) during the conduct of seismic-related activities.
- 6.6 Record all marine mammals, protected species, and marine turtle observations and respective mitigation actions (e.g., delay of soft start) in a standardized report format and submit a copy of the report to the Agency within **forty-five (45) days** of the activity completion. The report should contain at minimum the following:
- i. The location, date and start time of the activity;
 - ii. Name, qualification and experience of MMOs involved in the survey;
 - iii. The location, time and reasons when observations were hampered by poor visibility or high winds;
 - iv. The location and time when any start-up delays, power downs or stop work procedures were initiated due to marine mammal, protected species and marine turtle sightings;
 - v. The location, date, time and distance of any marine mammal, protected species and marine turtle sighting including species where possible and whether the sound source was active at the time of sighting; and
 - vi. The date and time when the activity was completed.
- 7.0 FPSO / DRILL SHIP / INSTALLATION AND SUPPORT VESSELS**
- 7.1 Vessels shall travel no faster than idle or 'no wake' speed within 300 metres of observed marine mammals and sea turtles, and not approach the animals closer than 100 metres.
- 7.2 Lighting on the vessels shall adhere to maritime safety regulations/standards.
- 7.3 Where practicable, direct lighting on FPSO and major vessels to required operational areas rather than at the sea surface or skyward.
- 7.4 Procedures for loading, storage, processing, and offloading operations, either for consumables (i.e., fuel, drilling fluids, and additives) or for liquid products, should be utilized to minimise spill risks. Pumps, hoses, and valves should be inspected and maintained on a monthly basis.
- 7.5 FPSO may be subject to inspection and certification by an appropriate national or international body, in accordance with International Maritime Organization (IMO) requirements. Double hull vessels are preferred, whenever available.

- 7.6 Offloading activities shall be supervised by the designated Mooring Master, according to the conditions of the sea.
- 7.7 The conditions and characteristics of the export tankers should be assessed by the Mooring Master and reported to the Offshore Field Manager prior to commencing offloading operations; only properly registered and well-maintained double-hull vessels should be utilized.
- 7.8 In accordance with MARPOL 73/78 requirements, maintain an Oil Record Book to document the manner in which sludge, oil, bilge water, waste oil, etc., are disposed.
- 7.9 In accordance with MARPOL requirements, maintain a Garbage Management Plan and Garbage Record Book to record the manner in which waste (e.g., sewage, macerated food waste, etc.) are managed and disposed. The Garbage Management Plan shall include all information as per MARPOL specification (waste type, quantity stored on-board, waste delivered ashore, amount of waste generated, and waste discharged at sea in accordance with MARPOL Requirements).
- 7.10 Equipment on board (engines, compressors, generators, sewage treatment plant and oil-water separators) shall be inspected and maintained in accordance with manufacturer's guidelines, in order to maximise efficiency and minimise malfunctions, and unnecessary discharges into the environment.

8.0 WELL BLOWOUT PREVENTION (BOP)

- 8.1 Install a well BOP system that can be closed rapidly in the event of an uncontrolled influx of formation fluids and that allows the well to be circulated to safety by venting the gas at surface and routing oil so that it may be contained. The BOP system should be tested at installation and at regular intervals (at least every **14 days** or as operations allow).
- 8.2 The BOP system shall be pressure tested at installation, after the disconnection or repair of any pressure containment seal in the BOP system, and at least every **14 days** or as operations allow. Subsea BOP stack should be tested to the maximum anticipated wellhead pressure for the current well program. Annular preventers should not be tested to greater than 70% of the working pressure of the preventer.
- 8.3 Facility personnel shall conduct bi-weekly well-control drills, or as operations allow, which should be attended by key personnel. Well control training and drills shall be documented and made available to the Agency upon request.
- 8.4 BOP testing shall be conducted by the drill ship contractor.

- 8.5 The BOP system design, maintenance, and repair shall be undertaken in accordance with international standards. It is recommended that, at a minimum, subsea BOP systems consist of one annular preventer, two shear ram preventers one of which must be sealings, and two pipe ram preventers, and that they be equipped with choke and kill lines and failsafe choke and kill close valves.
- 8.6 The BOP must be able to close on the maximum OD drill pipe string used for the drilling operations. BOP systems shall operate (failsafe) in the event of a loss of control signal and hydraulic supply from the surface. At a minimum, subsea BOP systems should allow closure of one set of pipe rams and all blind-shearing type rams by Remotely Operated Vehicle (ROV) intervention, should automatic systems fail.
- 8.7 Contingency plans shall be prepared for well operations and must include identification of provisions for well capping in the event of uncontrolled blowout (providing indication of the tools, equipment, and intervention time required) and identification of spill recovery measures.
- 8.8 Within **one (1 year)** of issuance of this Permit, an emergency plan shall be prepared, detailing the measures in place to prevent a blowout and the provisions for well control in a blowout scenario (including capping tools and oil spill recovery means) and submitted to the Agency.
- 9.0 OIL SPILLS AND OTHER EMERGENCY MANAGEMENT**
- 9.1 Adhere to the approved Oil Spill Response Plan contained within Volume III of the Environmental Impact Assessment, dated September, 2018.
- 9.2 Install an Emergency Shutdown System on the FPSO to initiate automatic shutdown actions to bring the offshore facility to a safe condition and which should be activated in case of any significant release.
- 9.3 Implement a corrosion management system to monitor risks and identify corrective actions in the atmospheric zone, splash zone, submerged zone and internal zones.
- 9.4 Develop and implement appropriate maintenance and monitoring programs to ensure the integrity of well field equipment.
- 9.5 Implement personnel training and field exercises such as drills in oil spill prevention, containment and response at the frequencies defined in the approved Oil Spill Response Plan submitted in the Environmental Impact Assessment.
- 9.6 Inspect, maintain and operate in-country spill response and containment equipment in accordance with the defined OSRP, which will include: monthly inspection of oil spill response equipment, quarterly test run of oil spill response equipment, annual preventive maintenance program execution, and annual

exercise and deployment of oil spill response equipment to test readiness and response capability. Ex-country spill response equipment shall be inspected according to the oil spill response organization's established programs which are aligned with good industry practice and periodically verified by operator.

- 9.7 Spills and near misses shall be documented and made available to the Agency upon request.
- 9.8 Notify the Agency in alignment with the approved Oil Spill Response Plan for the utilization of in-situ burning and/or use of dispersant (e.g., Corexit 9500, Corexit 9527A, Finasol OSR 52, and Dasic Slickgone NS.).
- 9.9 Build Capacity where applicable and/or ensure continued Oil Spill Response capacity building among key national Agencies, Community Based Organizations, Regional Democratic Councils, Neighbourhood Democratic Councils and other relevant stakeholders in Regions 1, 2, 3, 4, 5, and 6.

10.0 EMPLOYEES

- 10.1 Operate in accordance with the Occupational Safety and Health Act, 1997.
- 10.2 Employees must, at all times, be provided with the necessary personal protective equipment to job specification.
- 10.3 Implement and document training for all employees and contractors on the conditions of the Environmental Permit and good environmental management practices.
- 10.4 Employ a Health Safety and Environmental Officer and/or establish a health and Safety Committee who would be responsible for the implementation of the Health, Safety, Environmental and Social Management Plan and the terms and conditions of this Permit.

11.0 COMPLIANCE MONITORING AND REPORTING

- 11.1 Prepare and submit to the Agency no later than **forty-five (45) days** after the end of the operating year, a report relating to the activities for the previous year. The report shall include:
 - i. The identification information of the facility;
 - ii. Types and quantities of waste including hazardous waste generated, treatment and disposal (both onshore and offshore);
 - iii. Notwithstanding the obligation to immediately report any accidents and/or non-compliances with this permit, a summary of any accidents and non-compliances that may have occurred and any action(s) taken should be provided;

- iv. A report on all routine marine species observations on vessels, and any mitigation measures implemented to avoid injury or harm;
 - v. Provide and inventory of prior years' emissions including but not limited to particulate matter, sulphur dioxide, volatile organic compounds, carbon monoxide, nitrogen dioxide, and other greenhouse gases as applicable;
 - vi. Report on generation, treatment, and disposal of wastewater generated on all vessels associated with the project; and
 - vii. Any other matter the Agency may require.
- 11.2 Retain copies of all reports required by this Permit for a period of at least three (3) years.
- 11.3 Provide any information or copies of records requested within a reasonable timeframe, as requested by the Agency.
- 11.4 Submit to the Agency annually a summary of any non-conformances with the Environmental Permit and corrective actions taken.
- 11.5 Submit **Environmental Annual Report** to the EPA on or before **March 31** every year on your compliance with this Permit (Please see attached, *Guidelines for the Preparation of Environmental Annual Reports*).
- 11.6 Submit to the Agency Ballast Water Management Plans prepared specifically for the FPSO, Drill Ship, installation and support vessels, outlining how ballast water is managed in accordance with international standards.
- 11.7 Submit to the Agency within **one (1) week** of commencement of drilling a list and estimated quantities of all additives to be used in the drilling fluids.
- 11.8 Notify the Agency **21 days prior** to the proposed date of making any changes in the type of drilling fluid to be used, and outline the disposal/recycle/treatment methods to be applied. Notification after the 21 days period can be accepted under conditions where the notification period was not feasible or where flow assurance or safety risks are a concern.
- 11.9 Submit End of Well Reports **ninety (90) days** following the completion of drilling operations for each well with estimated quantities of fluids, additives and cuttings discharged, duration of discharges, and estimated maximum concentration of each constituent in the discharged drilling fluid.
- 11.10 Inform the Agency in the End of Well Report of tests conducted with the Blow out Preventer (BOP) equipment, detailing occasions where there was an influx of formation fluids, the well control methods applied, and their effectiveness.

- 11.11 Inform the Agency in a timely manner of any variation or intentions to conduct other activities not stipulated in this permit, such as, but not limited to Sidetracking of a well.
- 11.12 Notify the Agency in writing, **two (2) years** prior to planned decommissioning of the well, (save and except where mechanical issues or safety concerns are encountered that will affect the integrity of the well to continue operations) and submit revised End of Operations Decommissioning Plan including Well Abandonment Plan for approval.
- 11.13 Notify the Agency in writing, **six (6) months** prior to well abandonment (save and except where mechanical issues or safety concerns are encountered that will affect the integrity of the well to continue operations).
- 11.14 Submit to the EPA report(s) on the progress of the Project activities and compliance with the conditions under which this Permit was granted within **two (2) months** after the closure of activity specific Project stage (e.g., drilling, installation, etc.).
- 11.15 Report spills to the Agency and other relevant authorities in accordance with the Oil Spill Response Plan.
- 11.16 Notify the Agency in writing, 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.
- 11.17 Inform the Agency prior to or within **thirty (30) days** of any change of name or ownership of the Project.
- 11.18 Submit a copy of the International Oil Pollution Prevention (IOPP) Certificate for the FPSO.

12.0 LIABILITY FOR POLLUTION DAMAGE

- 12.1 The Permit Holder shall have insurance of such type and in such amount as is customary in the international petroleum industry in accordance with good oil field practices for Petroleum Operations in progress Offshore Guyana in respect of:
 - i. Loss or damage to all assets used in Project.
 - ii. Pollution caused in the course of the Project for which EGGPL will be, jointly and severally, held responsible.
 - iii. Loss or damage to property or bodily injury suffered by any third party in the course of the Project for which EGGPL is liable to, according to the terms of the policy.
 - iv. EEPGL's liability to its employees engaged in the Project.
 - v. Any other requirement(s) made by the EPA under condition 12.4 below.

- 12.2 Condition 12.1 shall not be interpreted to mean the Permit Holder, its Parent Company, Servants and/or Agents will not be liable to any other existing or forthcoming applicable laws, rules and regulations related to insurance for Petroleum Operations within or out the jurisdiction of Guyana.
- 12.3 This Permit is issued subject to the fulfillment of the obligations outlined in 12.1, above, and in a correspondence dated March 20, 2019 indicating the commitment of EEPGL to obtain such insurance for coverage of environmental liabilities, in accordance with the requirements of the EPA and the Bank of Guyana. **Failure to fulfill such obligations or commitments is in breach of this Permit and will result in its immediate cancellation.**
- 12.4 **The EPA shall reserve the right to request and review the environmental liability insurance policy.** Such review is subject to the following:
- i. Provision of documentary evidence that the insurer is authorised to provide the insurance in the jurisdiction and to provide evidence of the insurer's financial strength.
 - ii. Provision of details of the amount of cover and the cost profile, evidence of authorisation of the institution or parent (insurer's) to provide insurance. As well as, evidence of any supplementary cover required to cover gaps in the primary cover, inclusive of details relevant to the excess level which is the responsibility of the policyholder to cover.
 - iii. Agreement to provide notification to the EPA of modification, cancellation, expiration, intent to renew, renewal or non-renewal and expiry dates of the policy.
 - iv. Provision of reports on whether the insurance policy is maintained or renewed so that the EPA can determine if it is acceptable or if it requires a replacement policy.
 - v. Provision of the final insurance policy or certificate of insurance, evidence of financial strength and payment of premium.
- 12.5 The Permit Holder must, as soon as reasonably practicable, provide from the Parent Company or Affiliate Companies of Permit Holder and its Co-Venturers ("Affiliates") one or more legally binding agreements to the EPA, undertaking to provide adequate financial resources for Permit Holder and its Co-Venturers to pay or satisfy their respective environmental obligations regarding the Stabroek Block if EEPGL or its Co-Venturers fail to do so. As a consequence, EEPGL will be required to:
- 1) Provide evidence of the following:
 - That the Affiliate(s) are authorised to provide that guarantee or agreement in this jurisdiction.

- That the Affiliate(s) have sufficient financial strength for the amount of the potential liability.
- That the Affiliate(s) have the corporate legal capacity to enter into the agreement.

2) Agree to the following:

- To provide notification of cancellation, expiration, renewal or non-renewal and expiry dates of the Agreement.
- As well as, to provide annual audited financial statements and notification if the Affiliate(s) are no longer likely to be able to meet specified financial obligations.

- 12.6 The Permit Holder, his Servants and/or Agents shall be strictly liable for the adverse effect of any discharge or release, or cause or permit the entry of pollution, contaminant in any amount, concentration or level in excess of that prescribed by the regulations or stipulated by any environmental authorisation which are attributed to any Project (and more specifically petroleum activities) in accordance with section 19(1) and (2) of the Environmental Protection Act, Cap. 20:05, Laws of Guyana.
- 12.7 The Permit Holder shall compensate any Party who suffers any loss or damage as a result of the attributed project, in accordance with section 19(3)(e) of the Environmental Protection Act Cap. 20:05, Laws of Guyana.
- 12.8 Do not assign or transfer the Environmental Permit to any person without prior consent of the Agency.
- 12.9 The Permit Holder, his Servants and/or Agents shall be strictly liable to penalties prescribed for any material or environmental harm caused by pollution of the environment intentionally or recklessly in accordance, in accordance with section 39 (1), (2), (3) and (4) of the Environmental Protection Act, Cap. 20:05, Laws of Guyana.
- 12.10 The Permit Holder, his Servants and/or Agents shall be liable jointly and/or severally for any gross negligence or willful misconduct to the marine environment, biodiversity, protected species and natural habitat with respect to any release or discharge, spill, contaminant fluids, oil or lubricants from fuel storage at any facilities permitted under this project.
- 12.11 The Permit Holder, his Servants and/or Agents shall be liable jointly and/or severally for environmental damage due to pollution from its activities within Guyana, its territorial waters, contiguous zones, continental margins continental shelf, and Exclusive Economic Zone, inclusive of damage to the marine environment, biodiversity, protected species and natural habitat with respect to any release or discharge, spill, or contamination which is attributable to the Permit Holder and his agents or contractors. This is in accordance with Section

49 (1) of the Maritime Zones Act 2010 and is subject to any other existing or forthcoming laws, regulations and standards governing the protection of the marine environment.

- 12.12 Where it appears to the EPA 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 shall issue to the Permit Holder a Prohibition Notice ordering him to immediately cease the offending activity in accordance with section 27 of the Environmental Protection Act Cap. 20:05, Laws of Guyana.
- 12.13 Should the Permit Holder contravene or is likely to contravene any condition of this Permit, the EPA may serve him an enforcement notice in accordance with section 26 of the Environmental Protection Act Cap. 20:05, Laws of Guyana.

13.0 INSTITUTIONAL AUTHORITY

- 13.1 The EPA reserves the right to review and amend the conditions attached to this Permit.
- 13.2 The EPA reserves the right to conduct regular inspections of the permitted operation(s) as part of its monitoring and enforcement requirements under the Environmental Protection Act, Cap 20:05, Laws of Guyana, the Environmental Protection (Amendment) Act, 2005, and the Environmental Protection (Authorisations) Regulations 2000.
- 13.3 The Permit Holder 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 duties 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.
- 13.4 The EPA shall have the right to cancel or suspend this Permit for breach of any of the terms and conditions contained herein.
- 13.5 This Environmental Permit is not the final development consent. Permission from the other relevant regulatory bodies must be obtained prior to Project implementation as required.
- 13.6 The EPA reserves the right to review/amend the permit fees attached to this Permit, which also includes the review and/or amendment of permit fees in consideration of any changes in fee structure as determined by the Agency for projects of this nature.

Environmental Permit (Varied & Modified) - Ref. No.20171204-ESSLP
Issued under the Environmental Protection Act, Cap. 20:05, Laws of Guyana, the Environmental Protection (Amendment) Act, 2005, and Environmental Protection (Authorisations) Regulations, 2000

- 13.7 This Permit shall be governed by, interpreted and construed in accordance with the Laws of Guyana including but not limited to the Environmental Protection Act and Regulations and consistent with such rules of international law as may be applicable or appropriate, including the generally accepted customs and usages of the international petroleum industry.
- 13.8 This Permit is effective for the period stipulated herein (**April 26, 2019 to April 25, 2024**), or until notification by Permit Holder of completion of decommissioning activities, whichever is later.
- 13.9 This Environmental Permit shall remain valid until **April 25, 2024**, unless otherwise suspended, cancelled, modified or varied in accordance with the provisions of this Permit or the Environmental Protection Act, Cap. 20:05, Laws of Guyana, the Environmental Protection (Amendment) Act, 2005, and the Environmental Protection (Authorisations) Regulations, 2000.
- 13.10 Failure to comply with the requirements of this Permit or with applicable laws and regulations, whether existing or forthcoming, shall render the Permit Holder liable to prosecution and to penalties prescribed under the Environmental Protection Act, Cap. 20:05, Laws of Guyana, the Environmental Protection Regulations, 2000 and other applicable laws of Guyana.

Signed by  on behalf of the Environmental Protection Agency.
Kemraj Parsram
Executive Director

Date: 17.1.2022

Esso Exploration and Production Guyana Limited (EEPGL), hereby accepts 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, and the Environmental Protection (Authorisations) Regulations, 2000, and any existing or forthcoming regulations, best practices, guidelines and standards made under this Act.

NAME: Alistair G. Routledge

DESIGNATION: PRESIDENT

SIGNATURE: 

DATE: 17 JANUARY 2022

