ENVIRONMENTAL PROTECTION AGENCY (EPA) GUYANA

ENVIRONMENTAL AUTHORISATION SCREENING REPORT

NAME OF COMPANY: Esso Exploration and Production Guyana Limited

TYPE OF PROJECT: 35-MultiWell Exploration and Appraisal Drilling Programme

REFERENCE NO.: 20220530-EEPGL

PROJECT LOCATION: Stabroek Block, Offshore Guyana.

(Please note that the source of information provided in the following report is the Project Description submitted by the Developer/Company with the Application and exisiting Environmental Assessment and Management Plans prepared for the Canje Block fior previous applications.)

1.0 INTRODUCTION

Project Description

ESSO Exploration Limited (EEPGL) has submitted an application for the development of the 35-Well Exploration/Appraisal Drilling Campaign, Stabroek Block Offshore Guyana.

Based on data from exploration and development activities, the proposed 35 exploration/appraisal wells may be drilled within the four Prospect Areas as depicted on Figure 1. However, the exact locations of the 35 exploration/appraisal wells comprising the Project have not yet been finalized. While some of the 35 wells will be drilled for exploration purposes, it is also possible that some of the wells may be drilled as appraisal wells within the proximity of previously drilled exploration areas. If discoveries are found at particular locations, subsequent wells could be drilled in the vicinity of such locations to further assess the commerciality of the discoveries

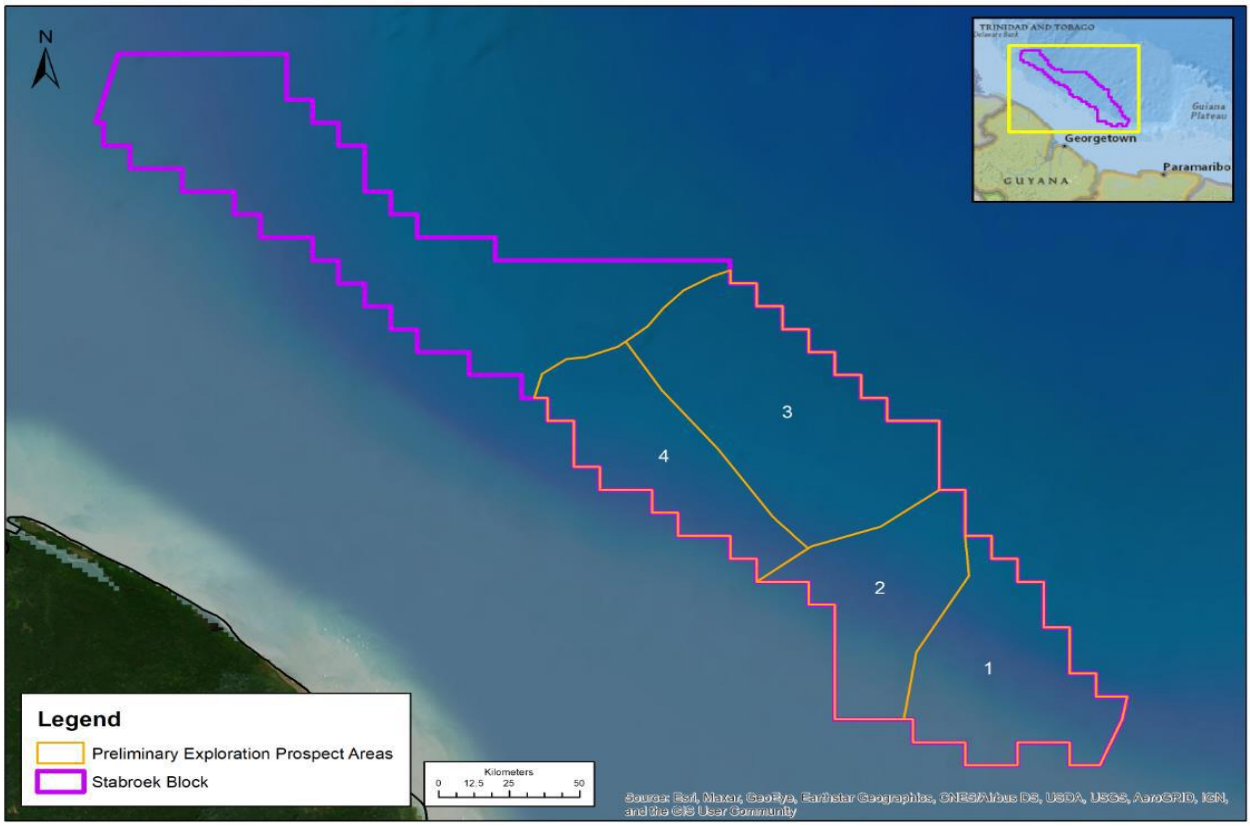

Figure 1: Prospect areas for proposed Stabroek Block 35-Well Exploration/Appraisal Drilling Campaign

It is anticipated that the Stabroek Block 35 well exploration/appraisal drilling campaign will begin in third quarter 2023, and if discoveries are made, well test(s) may be performed. Conclusion of the proposed drilling campaign is expected by fourth quarter 2028. This schedule is preliminary and could be influenced by new discoveries, determination of the need for sidetracks, and/or well tests—all of which could extend the drilling period for the Project. The same factors could also influence the locations and sequence of subsequent wells.

The process of drilling the 35 exploration/appraisal wells for the Project will be similar to the process followed during previous exploration/appraisal well campaigns as well as the previous development projects of Liza Phase 1, Liza Phase 2, and Payara. If a well test is determined to be warranted for the Project, the well would likely be temporarily abandoned to enable the return of a drill ship to re-enter the well and complete the well test at a later date. Please see below Table 1 with the proposed components that were relevant to the screening process:

Table 1 – Proposed Components of Drilling Campaign

Elements	Activity	Details
Drilling Operations	Drilling of Well	Deploying the drill ship to the site, spudding the well, moving the drill string into the well and managing drilling fluids
	Ancillary Operations (may occur if required)	
	Vertical Seismic Profiling (VSP)	Cretion of seismic images near borehole
	Well Testing	Temporary completion of a well to acquire dynamic rate through time, pressure, and fluid property data.
	Sidetracking	Drilling of secondary borehole for mechanical reasons or gathering additional data
Plugging and Abadonment	Plugging and abandoning well bore	Securing well casing and isolating wellbore from formation Deploying drill ship from well location

2.0 CHARACTERISTICS OF POTENTIAL IMPACTS

Marine Water Quality

Based on the project summary and application, the primary potential impacts on marine water quality from planned project activities have been identified as discharge of cuttings which can result in the increase in total suspended solids in the water column and routine operational discharges from the drill ship (e.g., treated sanitary waste discharges, bilge water, ballast water, etc.).

However, during drilling operations there can be unplanned events such as a loss-of-well-control event resulting in the release of hydrocarbons and also accidental discharge of fuel and/or hydraulic fuel from equipment from the drill ship.

Mitigation Measures

The key objective of the mitigation measures is to protect the marine environment and associated ecosystems and thus the following are proposed:

1. Vessel wastewater discharges (e.g., storage displacement water, ballast water, bilge water, deck drainage) to comply with MARPOL 73/78 requirements.

2. Use secondary containment for storage of bulk fuel, drilling fluids, and hazardous materials.

3. Leak detection systems for equipment, treatment, and storage facilities (fuel, chemical, etc.) on drill ships are in accordance with international offshore petroleum industry standards.

4. Maintain an OSRP to enable an effective response to an oil spill (Unplanned event)

5. Daily visual inspections of discharge points to confirm absence of floating solids or discoloration of surrounding waters.

6. Regular checks of pipe system and storage tanks for fuels and chemicals for leaks.

7. Use water-based drilling fluids and low toxicity IOGP Group III NADF.

8. Treatment of drill cuttings to a specified weighted mass ratio

9. Adhere to operational controls regarding material storage, wash- downs, and drainage systems.

Impact Significance

The timeline for drilling and completing individual wells varies and can last between 35-60 days due to well depth, reservoir characterisits, ancillary operations (VSPs, sidetrack). There is potential for negative impacts on water quality characteristics from planned activities identified above which can affect marine ecosystems and are considered major impacts that have a high likelihood occurring but the significance is considered to be low due to mitigation measures. Further, effects on water quality will be localized and temporary thus reinforcing the conclusions of low significance.

With unplanned events, the likelihood of occurrence is considered to be low however the consequence or severity is considered to be medium to high based on the geographical extent and duration of flow of the hydrocarbons from well bore or fuel or hydraulic fuel

spill from drill ships.

Air Quality/Noise

Project-related activities with the potential to result in air quality impacts include drilling of the well, well testing, and related support activities. The primary sources of potential impacts on air quality have been identified as emissions from combustion sources (incinerators, engines, etc.) particulate matter, VOCs and SO_2 from generators on drill ships.

Noise sources have been identified as the main power plants located on the drill ships and support vessels and the operation of various vessel-based equipment such as winches and craines. Underwater noise is also expected to occur should there be the conduct of VSP which involves the use of air guns (impacts of this will be discussed in ecology and biodiversity section).

Mitigation Measures

1. Operate incinerators in accordance with the manufacturers' operating manuals.
2. Regular maintenance of machinery to reduce air pollutants.
3. Shut down (or throttle down) sources of combustion equipment in intermittent use.
4. Prioritise the use of low sulphur diesel or ultra-low sulphur diesel.
5. Combust waste oil at an optimum temperature to minimise atmospheric emissions.
6. Operate and maintain all mechanical equipment in accordance with manufacturer's specifications.
7. All sound-making devices or equipment to be fitted with silencers or mufflers, and/or are enclosed, to reduce noise.

Impact Significance

As mentioned, the timelines for drilling exploratory wells are short term (35-60 days). Emissions from combustion sources and particulate matter is not expected to impact

onshore population due to the distance of the project site to land which is approximately 200 km. While the likelihood of occurance is considered to be high, the significance is considered to be negligible to low due to distance from the onshore receptors and duration of activity. Further, the application of mitigation measures is also expected to contribute to the low significance.

With respect noise, it is anticipated that this will attenuate with distance from the vessels thus resulting in low impact. Workers on site will be required to wear personal protective equipment to reduce any health impacts associated with excess noise.

Biodiversity

Impacts on biodiversity are outlined in the Table 2 below:

Table 2: Impacts to biodiversity receptors

Receptor	Activity	Impact	Impact Significance
Benthos	Spudding of well	Disruption of small area within footprint of borehole. Impacts expected to affect organisms within the footprint.	High likelihood and low impact **Reasons** Small footprint size at well head Short-term and localized
Fish	Project Related Activites • Effluent discharge from operation • Ballast Water Exchange Unplanned Events • Marine Oil Spill	Changes in water quality is expected to impact fish population in the vicinity of the well bore and drill ship Potential entrainment during uptake of ballast water Injury and mortality from marine oil spill	Low to medium likelihood with low impact **Reasons** Limited and localized impairments in water quality will not be significant enough to cause substantial changes in fish populations.

			Adherance to Oil Spill Response Plan
Marine Turtles	Project Related Activities • Artificial light from vessels • Sound disturbance from drilling • Exposure to vessel discharges Unplanned Events • Vessel strike • Marine Oil Spill	Injury and mortality from vessel strike and marine oil spills Potential health impacts from immediate exposure to effluent discharge from drill ship	Low likelihood with low impact **Reasons** Dedicated staff to scan mitigation zone around vessels to minimize the occurrence of vessel strikes Limited and localized impairments in water quality will not be significant enough to cause substantial impacts to marine turtles Discharges will be short term and localized Adherance to Oil Spill Response Plan
Marine Mammals	Project Related Activities • Artificial light from vessels • Sound disturbance from drilling • Exposure to vessel discharges • Vertical Seismic Profiling Operations Unplanned Events	Interference with echolocation and communication, and potential auditory injury from VSP operations and drilling operations Injury and mortality from vessel strike and marine oil spills Potential health impacts from immediate exposure to effluent discharge from drill ship	Medium likelihood with medium impact **Reasons** Underwater noise from VSP operations are expected to be short – term (if undertaken) Marine mammals tend to move away from areas with elevated underwater sound

	• Vessel strike • Marine Oil Spill		Drill ship will be stationary once operations commence thus reducing possibility of collision Dedicated staff to scan mitigation zone around vessels to minimize the occurrence of vessel strikes Limited and localized impairments in water quality will not be significant enough to cause substantial impacts to marine mammals Discharges will be short term and localized Adherance to Oil Spill Response Plan
Seabird	• Artificial Lighting from drill ships and supply vessels • Vessel strike	Displacement or attraction from sound and/or lighting Rafting seabirds may suffer injury or mortality from collision with vessels transiting to and from the Project Area. Injury and mortality from vessel strike and marine oil spills.	Low likelihood with low impact **Reasons** Dedicated staff to scan mitigation zone around vessels to minimize the occurrence of vessel strikes

Mitigation Measures

1. Implementation of JNCC Guidelines (2017) (VSP Operations)

2. Provision of standing instructions to vessel masters to:

    - Reduce their speed within 300 meters (984 feet) of observed marine mammals and marine turtles
    - Recognize signs of marine mammals and riverine mammals at sea surface
    - Avoid any identified rafting seabirds

3. Provide screening for seawater intakes to avoid entrainment and impingement of fauna.

4. Lighting on vessels should adhere to maritime safety regulations/standards

5. Trained Protected Species Observers (PSOs) onboard during the conduct of VSPs.

Waste Management

The primary categories of waste that will be generated include, hazardous, non-hazardous and domestic and sanitary, and can either be in solid or liquid state. Examples of waste streams include, black and grey water, waste oils, drill cuttings, food waste, ash from incerators, office waste etc.

Mitigation Measures

1. Treatment of waste water, sewage and food waste in accordance with MARPOL 73/78 regulations prior to discharge.

2. Wastes that cannot be reused, treated, or discharged/disposed on the drill ships will be manifested and safely transferred to appropriate onshore facilities for management.

3. Hazardous waste to be stored and transported to shore for treatment before disposal at landfill

4. Management of waste in accordance with Comprehensive Waste Management Plan approved by EPA December, 2021.

Impact Significance

The generation of waste from drilling operations is high, however, the severity of impacts is expected to be low due to several waste management plans that are in place that address the treatment, storage and disposal of the respective waste streams. The drill ships and supply vessels have the respective garbage management plans that have been prepared in accordance with MARPOL 73/78 requirements. Further, the operations will be required to comply with the Comprehensive Waste Management Plan approved by the EPA in 2021.

The drill ships and supply vessels are fitted with treatment systems for sewage, food and bilge water before any discharge to the marine environment. Any waste that cannot be disposed and or treated offshore will be transported to land for the necessary treatment prior to disposal at Hagg Bosch Landfill Site.

Socio-economic impacts

Project-related activities is not expected to impact coastal demographics given the activity will occur 200 km offshore. All workers, infrastructure and support vessels are in the offshore environment with very limited interaction at onshore locations, with the exception of obtaining supplies at port.

With respect to fishery operations there are no impacts that are anticipated due to the distance of the project location and fishing areas. However, unplanned events such as a marine oil spill has the potential to impact fishing grounds located further closer to the coastline due to movement of oil slicks.

Navigation and marine transportation may be temporarily impacted by the movement of supply vessels to and from the drill ship.

Mitigation Measures

1. Maintain marine safety exclusion zones around drill ships to prevent collision with other vessels

2. Adherance to Oil Spill Respone Plan

Impact Significance

The likelihood of impacts to coastal demographics and fisheries are low given the distance of the project site to the coastline and fishing grounds. The likelihood of an unplanned event occurring is also rated as low due to engineering designs and safety features aboard the drill ship. The activation of the Oil Spill Response Plan will also seek to reduce the impacts to both the ecological and socio-economic environments via containment procedures outlined therein.

The likelihood of impacts to marine transportation and navigation is also rated as low given vessel movement will be communicated to the Maritime Administration Department who will then issue a Notice to Mariners alerting other vessel operators of proposed schedules of movement.

3.0 PROJECT SIGNIFICANCE

CRITERION 1 PROJECT LOCATION (FOR EXAMPLE, A DENSELY POPULATED AREA; OR HIGH-DENSITY INDUSTRIAL ZONE)

As mentioned earlier the deep offshore marine environment and is approximately 200 km from the coastline of Guyana. The project is within the Exclusive Economic Zone of Guyana, where there is marine transporation. However, movement of vessels is coordinated and approved via the Maritime Administration Department and thus will issue the appropriate notices to ensure there is safe movement within Guyana's marine space.

CRITERION 2 ENVIRONMENTAL SENSITIVITY: WILL THE PROJECT BE LOCATED IN AN ENVIRONMENTALLY SENSITIVE AREA)

The project is located in the deep offshore marine environment and is approximately 200 km from the coastline of Guyana. There are no marine protected areas designated in Guyana's marine space.

CRITERION 3 LEVEL OF PUBLIC CONCERN

Level of Public Concern is considered low. The closest residents to the project are approximately 200 km away from project location. Conflicts with marine users is also considered very low since buffer zone will be established around the drill ships and will be established and communicated to mariners via the Maratime Administration Division. Further, fishing grounds are not located in deep water environment.

4.0 SUMMARY OF IMPACT RESULTS TABLE

Aspect of Impact	Definition
Likelihood	Likelihood of an impact to occur. Highly likelihood involves a degree of certainty (it will happen), medium (more likely to happen), low (not too likely that will happen), not probable (it won't happen).
Reversibility	An effect which is not permanent is reversible, if the impact is permanent, it is irreversible.
Extent/ Duration	Degree of range of impact, how far will it go? Nationally, Regionally, outside the boundaries of project, or locally, within the boundaries of project, confined to the area of an activity. This point refers to the time the impact will affect the resource. Short Term, Long term.
Severity/ Magnitude	Defining the magnitude of the impact. Who will get affected? Public and workers, Workers only, Not severe –Nothing is affected.

Receptors	Likelihood	Reversibility	Extent/ Duration	Severity/ Magnitude
Air Quality/Noise	Medium Likelihood	Reversible	35-60 days per well Within the boundaries of the Stabroek Block	Workers and fauna within and around the drill site
Marine Water Quality	High Likelihood	Reversible	35-60 days per well Within the boundaries of the Stabroek Block	Ecosystems within and around project site.
Ecology and Biodiversity	Low to Medium Likelihood	Reversible (Irreversible in some cases)	35-60 days per well Within the boundaries of	Marine flora and fauna within the Stabroek Block.

			the Stabroek Block	Cases where marine megafauna (marine mammals and marine turtles) are injured via vessel strikes and subsequently die, these impacts are considered to be irreversible. However, the likelihood of this occurring is low due to the presence of staff aboard the vessels that are trained to detect the presence of the animal within the mitigation zone.
Waste Management	High Likelihood	Reversible	35-60 days per well Within the boundaries of the Stabroek Block. However, some waste will come onshore for treatment and disposal.	Ecosystems within and around project site.
Socio-economic impacts	Low Likelihood	Reversible	35-60 days per well Within the boundaries of the Stabroek Block	Marine users, fishermen and coastlanders

5.0 RECOMMENDATION/CONCLUSION:

It can be concluded based on the existing data, technical review and exercise of discretion that the environmental and human impacts from the proposed 35 multi-well exploratory and appraisal drilling are **known.** While the likelihood of some of the impacts were noted to be high, the severity of these impacts' ranges from **low to medium** once mitigation measures outlined in **section 2** of this report are implemented.

However, it is noted that while the activity by itself may not have a significant impact on the environment, similar activities carried out in the Stabroek Block may have significantly affected the environment. Thus, given the number of exploratory projects that have occurred in the Stabroek Block and oil production projects that are currently ongoing in the same block, then in accordance with **Section 17 (1)**[1], it is recommended that a an environmental impact assessment of the cumulative effects of project be conducted (i.e. **Cumulative Impact Assessment (CIA)**).

Further, it is also recommended that the Project be placed on 30 days' Public Notice in-keeping with the Environmental Authorisation Regulations. Once there are No Objections/Appeals from the Public during publication time, the decision of the Agency shall be communicated to the Developer.

[1] Section 17 (1) reads "*Where any activity by itself does not have a significant effect on the environment but the same activity or similar activities are carried out by any person in any place and cumulatively may significantly affect the environment, the Agency shall require to be carried out an environmental impact assessment of the cumulative effects of such activities by such persons.*"