



Papua LNG Project – Downstream
Environmental Impact Statement

ATTACHMENT 3

Management measures register

ExxonMobil PNG Antelope Limited



ExxonMobil



754-MELEN300733: Papua LNG Project – Downstream
Management Measures Register

Aspect	Cause of impact (activity/event)	Impact	MM ID	Management Measure	Project phase		Source
					Construction	Operation	
Groundwater	Construction and operations of additional new facilities at the LNG Plant site	•Potential contamination from hydrocarbons, fuels, lubrication oils and chemicals due to the transport, storage, and handling of these materials during construction. •Potential contamination from the STP and sanitary collection pits during operations. •Potential contamination from leaks should some form of damage occur to pipework or processing units. Volatile organic compounds (VOCs) in liquid form, such as benzene, xylene and toluene, and heavy metals such as mercury are other potential contaminants of concern.	MM01	Maintain vehicles and machinery to minimise the potential for leaks.	x	x	EIS Chapter 11
Groundwater	Construction and operations of additional new facilities at the LNG Plant site	•Potential contamination from hydrocarbons, fuels, lubrication oils and chemicals due to the transport, storage, and handling of these materials during construction. •Potential contamination from the STP and sanitary collection pits during operations. •Potential contamination from leaks should some form of damage occur to pipework or processing units. Volatile organic compounds (VOCs) in liquid form, such as benzene, xylene and toluene, and heavy metals such as mercury are other potential contaminants of concern.	MM02	Store fuel, lubricating oils and chemicals required during construction in appropriately designed and sized designated containment areas.	x	x	EIS Chapter 11
Groundwater	Construction and operations of additional new facilities at the LNG Plant site	•Potential contamination from hydrocarbons, fuels, lubrication oils and chemicals due to the transport, storage, and handling of these materials during construction. •Potential contamination from the STP and sanitary collection pits during operations. •Potential contamination from leaks should some form of damage occur to pipework or processing units. Volatile organic compounds (VOCs) in liquid form, such as benzene, xylene and toluene, and heavy metals such as mercury are other potential contaminants of concern.	MM03	Develop a spill response plan for the Project and include staff training at induction to inform workers of their responsibilities under the plan.	x	x	EIS Chapter 11
Groundwater	Construction and operations of additional new facilities at the LNG Plant site	•Potential contamination from hydrocarbons, fuels, lubrication oils and chemicals due to the transport, storage, and handling of these materials during construction. •Potential contamination from the STP and sanitary collection pits during operations. •Potential contamination from leaks should some form of damage occur to pipework or processing units. Volatile organic compounds (VOCs) in liquid form, such as benzene, xylene and toluene, and heavy metals such as mercury are other potential contaminants of concern.	MM04	Manage wastewaters from the plant and associated facilities appropriately in accordance with the wastewater management plan that will be prepared based on existing the PNG LNG Project plans.	x	x	EIS Chapter 11
Groundwater	Construction and operations of additional new facilities at the LNG Plant site	•Potential contamination from hydrocarbons, fuels, lubrication oils and chemicals due to the transport, storage, and handling of these materials during construction. •Potential contamination from the STP and sanitary collection pits during operations. •Potential contamination from leaks should some form of damage occur to pipework or processing units. Volatile organic compounds (VOCs) in liquid form, such as benzene, xylene and toluene, and heavy metals such as mercury are other potential contaminants of concern.	MM05	Provide suitable containment for all parts of the new facilities where hazardous or dangerous goods (e.g., fuel, lubricating oils and chemicals) are stored or used.	x	x	EIS Chapter 11
Groundwater	Construction and operations of additional new facilities at the LNG Plant site	•Potential contamination from hydrocarbons, fuels, lubrication oils and chemicals due to the transport, storage, and handling of these materials during construction. •Potential contamination from the STP and sanitary collection pits during operations. •Potential contamination from leaks should some form of damage occur to pipework or processing units. Volatile organic compounds (VOCs) in liquid form, such as benzene, xylene and toluene, and heavy metals such as mercury are other potential contaminants of concern.	MM06	Design, construct and operation new project facilities in line with good industry practice.	x	x	EIS Chapter 11

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					Construction	Operation	
Surface water	Construction and operations of additional new facilities at the LNG Plant site	•Removal of vegetation resulting in exposed surfaces, leading to increased sedimentation in runoff to surface water. •Construction-disturbed soils exposed to rainfall runoff or to surface water or groundwater in excavations leading to release of dissolved and particulate-associated metals and nutrients. •Modification of surface water flows and changes to existing hydrological regimes, including flooding. •Accidental spills of harmful substances which may lead to surface water quality impacts. •Additional or altered discharges from the LNG Plant during operations, such as hydrotest water.	MM07	Limit clearing of riparian vegetation to the areas necessary to undertake construction activities safely. Prevent construction personnel from entering areas outside of project-related activities to minimise damage to vegetation.	x	x	EIS Chapter 11
Surface water	Construction and operations of additional new facilities at the LNG Plant site	•Removal of vegetation resulting in exposed surfaces, leading to increased sedimentation in runoff to surface water. •Construction-disturbed soils exposed to rainfall runoff or to surface water or groundwater in excavations leading to release of dissolved and particulate-associated metals and nutrients. •Modification of surface water flows and changes to existing hydrological regimes, including flooding. •Accidental spills of harmful substances which may lead to surface water quality impacts. •Additional or altered discharges from the LNG Plant during operations, such as hydrotest water.	MM08	Limiting ground disturbance and vegetation clearing to areas required for the new plant facilities.	x	x	EIS Chapter 11
Surface water	Construction and operations of additional new facilities at the LNG Plant site	•Removal of vegetation resulting in exposed surfaces, leading to increased sedimentation in runoff to surface water. •Construction-disturbed soils exposed to rainfall runoff or to surface water or groundwater in excavations leading to release of dissolved and particulate-associated metals and nutrients. •Modification of surface water flows and changes to existing hydrological regimes, including flooding. •Accidental spills of harmful substances which may lead to surface water quality impacts. •Additional or altered discharges from the LNG Plant during operations, such as hydrotest water.	MM09	At new or improved road crossings, maintain connectivity in watercourses for wet season flow to enable fish migration.	x	x	EIS Chapter 11
Surface water	Construction and operations of additional new facilities at the LNG Plant site	•Removal of vegetation resulting in exposed surfaces, leading to increased sedimentation in runoff to surface water. •Construction-disturbed soils exposed to rainfall runoff or to surface water or groundwater in excavations leading to release of dissolved and particulate-associated metals and nutrients. •Modification of surface water flows and changes to existing hydrological regimes, including flooding. •Accidental spills of harmful substances which may lead to surface water quality impacts. •Additional or altered discharges from the LNG Plant during operations, such as hydrotest water.	MM10	Reinstate disturbed areas to former landforms as far as practicable and revegetate exposed areas as soon as practicable once construction activities are completed in particular locations. Erosion-prone areas will receive particular attention.	x	x	EIS Chapter 11
Surface water	Construction and operations of additional new facilities at the LNG Plant site	•Removal of vegetation resulting in exposed surfaces, leading to increased sedimentation in runoff to surface water. •Construction-disturbed soils exposed to rainfall runoff or to surface water or groundwater in excavations leading to release of dissolved and particulate-associated metals and nutrients. •Modification of surface water flows and changes to existing hydrological regimes, including flooding. •Accidental spills of harmful substances which may lead to surface water quality impacts. •Additional or altered discharges from the LNG Plant during operations, such as hydrotest water.	MM11	Design and construct watercourse crossings, diversions and culverts to accommodate expected stream flows during the Project construction phase and maintain these during operations.	x	x	EIS Chapter 11
Surface water	Construction and operations of additional new facilities at the LNG Plant site	•Removal of vegetation resulting in exposed surfaces, leading to increased sedimentation in runoff to surface water. •Construction-disturbed soils exposed to rainfall runoff or to surface water or groundwater in excavations leading to release of dissolved and particulate-associated metals and nutrients. •Modification of surface water flows and changes to existing hydrological regimes, including flooding. •Accidental spills of harmful substances which may lead to surface water quality impacts. •Additional or altered discharges from the LNG Plant during operations, such as hydrotest water.	MM12	Implement good industry practice erosion control measures downstream of construction areas.	x		EIS Chapter 11

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					Construction	Operation	
Spill prevention and response	Storage, distribution, handling and use of hazardous materials and chemicals from the Project, including: •LNG Plant •Vehicles, equipment, and machinery •Subsea pipelines •Transport routes to and from the Project area	•Contamination of environment (i.e., surface water, groundwater, and marine environment) resulting from accidental spills or leakages, and if not contained/managed immediately, could lead to adverse impacts on terrestrial, freshwater and marine biodiversity. These impacts on biodiversity may include lethal and sub-lethal effects on fauna species. •Health impacts to project personnel and/or the local communities.	MM13	Develop a Contractor's Spill Prevention and Response CIPs for the Project and train staff in their responsibilities under the CIP. The CIP will include (as a minimum): •Activity description and operator information. •Identification of spill response personnel, their roles, and contact details. •Notification requirements. •Diagrams of surrounding layout, topography, evacuation and drainage paths, ecological and protected areas, and community and cultural sensitivities. •Categorisation of spills based on location, type, volume, and environmental sensitivity. •Strategies and equipment for managing spills. •Procedures for mobilising external resources and deployment strategies for larger spills. •Comprehensive list and descriptions of on-site and off-site response equipment, along with deployment time estimates. •Identification of response priorities with input from potentially affected parties. •Handling instructions for recovered contaminated materials, including transportation, temporary storage, treatment, and disposal. •Identification and evaluation of potential discharge hazards and description of discharge detection procedures and equipment. •Facility response, self-inspection, training requirements, inductions, exercises, drills.	x		Spill prevention and response management plan
Spill prevention and response	Storage, distribution, handling and use of hazardous materials and chemicals from the Project, including: •LNG Plant •Vehicles, equipment, and machinery •Subsea pipelines •Transport routes to and from the Project area	•Contamination of environment (i.e., surface water, groundwater, and marine environment) resulting from accidental spills or leakages, and if not contained/managed immediately, could lead to adverse impacts on terrestrial, freshwater and marine biodiversity. These impacts on biodiversity may include lethal and sub-lethal effects on fauna species. •Health impacts to project personnel and/or the local communities.	MM14	Conduct a spill risk assessment to identify high-risk areas and activities, minimise risks, and develop specific response measures for the site.	x		Spill prevention and response management plan
Spill prevention and response	Storage, distribution, handling and use of hazardous materials and chemicals from the Project, including: •LNG Plant •Vehicles, equipment, and machinery •Subsea pipelines •Transport routes to and from the Project area	•Contamination of environment (i.e., surface water, groundwater, and marine environment) resulting from accidental spills or leakages, and if not contained/managed immediately, could lead to adverse impacts on terrestrial, freshwater and marine biodiversity. These impacts on biodiversity may include lethal and sub-lethal effects on fauna species. •Health impacts to project personnel and/or the local communities.	Refer to MM06		x		Spill prevention and response management plan
Spill prevention and response	Storage, distribution, handling and use of hazardous materials and chemicals from the Project, including: •LNG Plant •Vehicles, equipment, and machinery •Subsea pipelines •Transport routes to and from the Project area	•Contamination of environment (i.e., surface water, groundwater, and marine environment) resulting from accidental spills or leakages, and if not contained/managed immediately, could lead to adverse impacts on terrestrial, freshwater and marine biodiversity. These impacts on biodiversity may include lethal and sub-lethal effects on fauna species. •Health impacts to project personnel and/or the local communities.	Refer to MM08		x		Spill prevention and response management plan
Spill prevention and response	Storage, distribution, handling and use of hazardous materials and chemicals from the Project, including: •LNG Plant •Vehicles, equipment, and machinery •Subsea pipelines •Transport routes to and from the Project area	•Contamination of environment (i.e., surface water, groundwater, and marine environment) resulting from accidental spills or leakages, and if not contained/managed immediately, could lead to adverse impacts on terrestrial, freshwater and marine biodiversity. These impacts on biodiversity may include lethal and sub-lethal effects on fauna species. •Health impacts to project personnel and/or the local communities.	MM15	Provide spill response kits at required locations where hazardous materials are being used, handled, transferred, or stored.	x		Spill prevention and response management plan
Spill prevention and response	Storage, distribution, handling and use of hazardous materials and chemicals from the Project, including: •LNG Plant •Vehicles, equipment, and machinery •Subsea pipelines •Transport routes to and from the Project area	•Contamination of environment (i.e., surface water, groundwater, and marine environment) resulting from accidental spills or leakages, and if not contained/managed immediately, could lead to adverse impacts on terrestrial, freshwater and marine biodiversity. These impacts on biodiversity may include lethal and sub-lethal effects on fauna species. •Health impacts to project personnel and/or the local communities.	MM16	Regularly inspect project facilities, such as tanks, pumps, pipelines, and vehicles/equipment, for potential spills or leaks. Verify that appropriate spill kits are available and carried as needed.	x		Spill prevention and response management plan
Spill prevention and response	Storage, distribution, handling and use of hazardous materials and chemicals from the Project, including: •LNG Plant •Vehicles, equipment, and machinery •Subsea pipelines •Transport routes to and from the Project area	•Contamination of environment (i.e., surface water, groundwater, and marine environment) resulting from accidental spills or leakages, and if not contained/managed immediately, could lead to adverse impacts on terrestrial, freshwater and marine biodiversity. These impacts on biodiversity may include lethal and sub-lethal effects on fauna species. •Health impacts to project personnel and/or the local communities.	MM17	Store copies of relevant Material Safety Data Sheets (MSDS) where hazardous materials are stored, handled or used.	x		Spill prevention and response management plan

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Spill prevention and response	Storage, distribution, handling and use of hazardous materials and chemicals from the Project, including: •LNG Plant •Vehicles, equipment, and machinery •Subsea pipelines •Transport routes to and from the Project area	•Contamination of environment (i.e., surface water, groundwater, and marine environment) resulting from accidental spills or leakages, and if not contained/managed immediately, could lead to adverse impacts on terrestrial, freshwater and marine biodiversity. These impacts on biodiversity may include lethal and sub-lethal effects on fauna species. •Health impacts to project personnel and/or the local communities.	MM18	Train personnel in implementing spill prevention response mitigation and management measures.	x		Spill prevention and response management plan
Spill prevention and response	Storage, distribution, handling and use of hazardous materials and chemicals from the Project, including: •LNG Plant •Vehicles, equipment, and machinery •Subsea pipelines •Transport routes to and from the Project area	•Contamination of environment (i.e., surface water, groundwater, and marine environment) resulting from accidental spills or leakages, and if not contained/managed immediately, could lead to adverse impacts on terrestrial, freshwater and marine biodiversity. These impacts on biodiversity may include lethal and sub-lethal effects on fauna species. •Health impacts to project personnel and/or the local communities.	MM19	Prevent co-mingling of, or contact between, incompatible wastes that allows for inspection between containers to monitor leaks or spills.	x		Spill prevention and response management plan
Spill prevention and response	Storage, distribution, handling and use of hazardous materials and chemicals from the Project, including: •LNG Plant •Vehicles, equipment, and machinery •Subsea pipelines •Transport routes to and from the Project area	•Contamination of environment (i.e., surface water, groundwater, and marine environment) resulting from accidental spills or leakages, and if not contained/managed immediately, could lead to adverse impacts on terrestrial, freshwater and marine biodiversity. These impacts on biodiversity may include lethal and sub-lethal effects on fauna species. •Health impacts to project personnel and/or the local communities.	MM20	Conduct regular emergency drills or mock workplace incident scenarios to practice timely and effective emergency and spill preparedness and response.	x		Spill prevention and response management plan
Spill prevention and response	Storage, distribution, handling and use of hazardous materials and chemicals from the Project, including: •LNG Plant •Vehicles, equipment, and machinery •Subsea pipelines •Transport routes to and from the Project area	•Contamination of environment (i.e., surface water, groundwater, and marine environment) resulting from accidental spills or leakages, and if not contained/managed immediately, could lead to adverse impacts on terrestrial, freshwater and marine biodiversity. These impacts on biodiversity may include lethal and sub-lethal effects on fauna species. •Health impacts to project personnel and/or the local communities.	MM21	Appropriately contain spills during servicing operations and verify they are conducted in appropriate locations.	x		Spill prevention and response management plan
Spill prevention and response	Storage, distribution, handling and use of hazardous materials and chemicals from the Project, including: •LNG Plant •Vehicles, equipment, and machinery •Subsea pipelines •Transport routes to and from the Project area	•Contamination of environment (i.e., surface water, groundwater, and marine environment) resulting from accidental spills or leakages, and if not contained/managed immediately, could lead to adverse impacts on terrestrial, freshwater and marine biodiversity. These impacts on biodiversity may include lethal and sub-lethal effects on fauna species. •Health impacts to project personnel and/or the local communities.	MM22	Prohibit washing equipment, vehicles, or machinery near or within watercourses and the marine environment to avoid potential spills or releases of hazardous materials and chemicals.	x		Spill prevention and response management plan
Spill prevention and response	Storage, distribution, handling and use of hazardous materials and chemicals from the Project, including: •LNG Plant •Vehicles, equipment, and machinery •Subsea pipelines •Transport routes to and from the Project area	•Contamination of environment (i.e., surface water, groundwater, and marine environment) resulting from accidental spills or leakages, and if not contained/managed immediately, could lead to adverse impacts on terrestrial, freshwater and marine biodiversity. These impacts on biodiversity may include lethal and sub-lethal effects on fauna species. •Health impacts to project personnel and/or the local communities.	MM23	Facilitate safe transfer of fuel to and from storage tanks by providing devices such as dry-break couplings, automatic flow cut off devices, and tank overflow controls.	x		Spill prevention and response management plan
Spill prevention and response	Storage, distribution, handling and use of hazardous materials and chemicals from the Project, including: •LNG Plant •Vehicles, equipment, and machinery •Subsea pipelines •Transport routes to and from the Project area	•Contamination of environment (i.e., surface water, groundwater, and marine environment) resulting from accidental spills or leakages, and if not contained/managed immediately, could lead to adverse impacts on terrestrial, freshwater and marine biodiversity. These impacts on biodiversity may include lethal and sub-lethal effects on fauna species. •Health impacts to project personnel and/or the local communities.	MM24	Perform field refuelling and storage operations using licensed fuel trucks on designated areas located at least 30 m away from any natural or man-made drainage systems.	x		Spill prevention and response management plan
Spill prevention and response	Storage, distribution, handling and use of hazardous materials and chemicals from the Project, including: •LNG Plant •Vehicles, equipment, and machinery •Subsea pipelines •Transport routes to and from the Project area	•Contamination of environment (i.e., surface water, groundwater, and marine environment) resulting from accidental spills or leakages, and if not contained/managed immediately, could lead to adverse impacts on terrestrial, freshwater and marine biodiversity. These impacts on biodiversity may include lethal and sub-lethal effects on fauna species. •Health impacts to project personnel and/or the local communities.	MM25	Conduct inspections to evaluate the presence and condition of spill prevention measures. Report all spill incidents, to the Company using the Incident Reporting procedure (or similar).	x		Spill prevention and response management plan

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					Construction	Operation	
Spill prevention and response	Storage, distribution, handling and use of hazardous materials and chemicals from the Project, including: •LNG Plant •Vehicles, equipment, and machinery •Subsea pipelines •Transport routes to and from the Project area	•Contamination of environment (i.e., surface water, groundwater, and marine environment) resulting from accidental spills or leakages, and if not contained/managed immediately, could lead to adverse impacts on terrestrial, freshwater and marine biodiversity. These impacts on biodiversity may include lethal and sub-lethal effects on fauna species. •Health impacts to project personnel and/or the local communities.	MM26	In the event of spill, contain and clean up all spills immediately and report all spills to the Company using the Incident Reporting procedure (or similar), which details: •Material released. •Volume. •Location. •Cause. •Proposed corrective measures, where appropriate. For all uncontained releases, the following additional information will be provided: •Response time. •Effectiveness of response. •Document any corrective actions/improvements that may be required. •Waste disposal requirements and outcome.	x		Spill prevention and response management plan
Spill prevention and response	Storage, distribution, handling and use of hazardous materials and chemicals from the Project, including: •LNG Plant •Vehicles, equipment, and machinery •Subsea pipelines •Transport routes to and from the Project area	•Contamination of environment (i.e., surface water, groundwater, and marine environment) resulting from accidental spills or leakages, and if not contained/managed immediately, could lead to adverse impacts on terrestrial, freshwater and marine biodiversity. These impacts on biodiversity may include lethal and sub-lethal effects on fauna species. •Health impacts to project personnel and/or the local communities.	MM27	Monitor soil and/or stream water samples, if affected by spill.	x		Spill prevention and response management plan
Spill prevention and response	Storage, distribution, handling and use of hazardous materials and chemicals from the Project, including: •LNG Plant •Vehicles, equipment, and machinery •Subsea pipelines •Transport routes to and from the Project area	•Contamination of environment (i.e., surface water, groundwater, and marine environment) resulting from accidental spills or leakages, and if not contained/managed immediately, could lead to adverse impacts on terrestrial, freshwater and marine biodiversity. These impacts on biodiversity may include lethal and sub-lethal effects on fauna species. •Health impacts to project personnel and/or the local communities.	MM28	Perform visual inspections of hazardous materials and chemical transport containers including wall thickness, deformity, leak checks and likely third-party interference.	x		Spill prevention and response management plan
Spill prevention and response	Storage, distribution, handling and use of hazardous materials and chemicals from the Project, including: •LNG Plant •Vehicles, equipment, and machinery •Subsea pipelines •Transport routes to and from the Project area	•Contamination of environment (i.e., surface water, groundwater, and marine environment) resulting from accidental spills or leakages, and if not contained/managed immediately, could lead to adverse impacts on terrestrial, freshwater and marine biodiversity. These impacts on biodiversity may include lethal and sub-lethal effects on fauna species. •Health impacts to project personnel and/or the local communities.	MM29	Bund or curbing to be installed around storage areas to contain spills.	x		Spill prevention and response management plan
Spill prevention and response	Storage, distribution, handling and use of hazardous materials and chemicals from the Project, including: •LNG Plant •Vehicles, equipment, and machinery •Subsea pipelines •Transport routes to and from the Project area	•Contamination of environment (i.e., surface water, groundwater, and marine environment) resulting from accidental spills or leakages, and if not contained/managed immediately, could lead to adverse impacts on terrestrial, freshwater and marine biodiversity. These impacts on biodiversity may include lethal and sub-lethal effects on fauna species. •Health impacts to project personnel and/or the local communities.	MM30	Bund areas where liquids are stored to confirm that small spills are contained to open drain sump.	x		Spill prevention and response management plan
Spill prevention and response	Storage, distribution, handling and use of hazardous materials and chemicals from the Project, including: •LNG Plant •Vehicles, equipment, and machinery •Subsea pipelines •Transport routes to and from the Project area	•Contamination of environment (i.e., surface water, groundwater, and marine environment) resulting from accidental spills or leakages, and if not contained/managed immediately, could lead to adverse impacts on terrestrial, freshwater and marine biodiversity. These impacts on biodiversity may include lethal and sub-lethal effects on fauna species. •Health impacts to project personnel and/or the local communities.	MM31	Install shutdown valves between vessels to restrict the volume of potential leak.	x		Spill prevention and response management plan
Spill prevention and response	Storage, distribution, handling and use of hazardous materials and chemicals from the Project, including: •LNG Plant •Vehicles, equipment, and machinery •Subsea pipelines •Transport routes to and from the Project area	•Contamination of environment (i.e., surface water, groundwater, and marine environment) resulting from accidental spills or leakages, and if not contained/managed immediately, could lead to adverse impacts on terrestrial, freshwater and marine biodiversity. These impacts on biodiversity may include lethal and sub-lethal effects on fauna species. •Health impacts to project personnel and/or the local communities.	MM32	Review and update the existing emergency response plans developed by ExxonMobil for the LNG Plant, to confirm it remains appropriate to the Project and proposed activities. The existing ERP includes: •A spill response plan for concentrate, oil and other hazardous substances. •Staff training during the induction process is necessary to raise awareness of their responsibilities, enable them to identify risks or potential sources of chemical and fuel spills, and apply appropriate control measures. Requirements of staff for training during the induction process to facilitate awareness of their responsibilities, ensure that they can identify risks or sources of potential chemical and fuel spills, and can apply appropriate control measures. •Identify's risks or sources of potential chemical and fuel spills and outlines application processes for appropriate control or clean-up equipment.	x		Spill prevention and response management plan

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					Construction	Operation	
Water use	Storage and discharge of brine, effluent, other wastewaters and stormwater to surrounding waterways and marine waters from project activities and components, including: •Desalination facilities (i.e., brine). •Retention pond and mixing pit. •Sanitary wastewater treatment systems (e.g., toilets, washrooms, kitchens and buildings). •Process area surface runoff •TSS-laden waters. •Thermal oxidiser spent water. •Hydrotest waters.	•Effects on water quality with associated effects on ecological habitats, including: oPhysiological effects to aquatic fauna (e.g., clogging of gills with suspended solids, direct ingestion of contaminants, adsorption of contaminants to the surfaces of organisms, and bioaccumulation in the tissue of organisms). oHabitat deterioration reducing viable habitats for fauna and increasing competition. oAltered species composition and abundance. Reduced suitable/clean water and aquatic resources used by local communities. •Reduced suitable/clean water and aquatic resources used by local communities. •Reduction in water availability for other water beneficial uses of local communities (e.g., use for cooking, bathing, washing)	MM33	Avoid contaminated effluent being discharged into the surrounding watercourses, wetlands and to the marine environment. Downstream of effluent discharges, water quality will comply with the Environment Permit criteria.	x		Water use management plan
Water use	Storage and discharge of brine, effluent, other wastewaters and stormwater to surrounding waterways and marine waters from project activities and components, including: •Desalination facilities (i.e., brine). •Retention pond and mixing pit. •Sanitary wastewater treatment systems (e.g., toilets, washrooms, kitchens and buildings). •Process area surface runoff •TSS-laden waters. •Thermal oxidiser spent water. •Hydrotest waters.	•Effects on water quality with associated effects on ecological habitats, including: oPhysiological effects to aquatic fauna (e.g., clogging of gills with suspended solids, direct ingestion of contaminants, adsorption of contaminants to the surfaces of organisms, and bioaccumulation in the tissue of organisms). oHabitat deterioration reducing viable habitats for fauna and increasing competition. oAltered species composition and abundance. Reduced suitable/clean water and aquatic resources used by local communities. •Reduced suitable/clean water and aquatic resources used by local communities. •Reduction in water availability for other water beneficial uses of local communities (e.g., use for cooking, bathing, washing).	MM34	Implement good industry practice erosion control measures downstream of construction areas and the marine environment.	x		Water use management plan
Water use	Storage and discharge of brine, effluent, other wastewaters and stormwater to surrounding waterways and marine waters from project activities and components, including: •Desalination facilities (i.e., brine). •Retention pond and mixing pit. •Sanitary wastewater treatment systems (e.g., toilets, washrooms, kitchens and buildings). •Process area surface runoff •TSS-laden waters. •Thermal oxidiser spent water. •Hydrotest waters.	•Effects on water quality with associated effects on ecological habitats, including: oPhysiological effects to aquatic fauna (e.g., clogging of gills with suspended solids, direct ingestion of contaminants, adsorption of contaminants to the surfaces of organisms, and bioaccumulation in the tissue of organisms). oHabitat deterioration reducing viable habitats for fauna and increasing competition. oAltered species composition and abundance. Reduced suitable/clean water and aquatic resources used by local communities. •Reduced suitable/clean water and aquatic resources used by local communities. •Reduction in water availability for other water beneficial uses of local communities (e.g., use for cooking, bathing, washing)	MM35	Comply with MARPOL standards (prohibiting discharges within three nautical miles of the coast) and with international port policies and procedures applying to marine facilities and vessels within this distance.	x		Water use management plan
Water use	Storage and discharge of brine, effluent, other wastewaters and stormwater to surrounding waterways and marine waters from project activities and components, including: •Desalination facilities (i.e., brine). •Retention pond and mixing pit. •Sanitary wastewater treatment systems (e.g., toilets, washrooms, kitchens and buildings). •Process area surface runoff •TSS-laden waters. •Thermal oxidiser spent water. •Hydrotest waters.	•Effects on water quality with associated effects on ecological habitats, including: oPhysiological effects to aquatic fauna (e.g., clogging of gills with suspended solids, direct ingestion of contaminants, adsorption of contaminants to the surfaces of organisms, and bioaccumulation in the tissue of organisms). oHabitat deterioration reducing viable habitats for fauna and increasing competition. oAltered species composition and abundance. Reduced suitable/clean water and aquatic resources used by local communities. •Reduced suitable/clean water and aquatic resources used by local communities. •Reduction in water availability for other water beneficial uses of local communities (e.g., use for cooking, bathing, washing).	MM36	Treat stormwater runoff contaminated with hydrocarbons through an oil/water separation system able to achieve environment permit criteria.	x		Water use management plan

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					Construction	Operation	
Water use	Storage and discharge of brine, effluent, other wastewaters and stormwater to surrounding waterways and marine waters from project activities and components, including: •Desalination facilities (i.e., brine). •Retention pond and mixing pit. •Sanitary wastewater treatment systems (e.g., toilets, washrooms, kitchens and buildings). •Process area surface runoff •TSS-laden waters. •Thermal oxidiser spent water. •Hydrotest waters.	•Effects on water quality with associated effects on ecological habitats, including: oPhysiological effects to aquatic fauna (e.g., clogging of gills with suspended solids, direct ingestion of contaminants, adsorption of contaminants to the surfaces of organisms, and bioaccumulation in the tissue of organisms). oHabitat deterioration reducing viable habitats for fauna and increasing competition. oAltered species composition and abundance. Reduced suitable/clean water and aquatic resources used by local communities. •Reduced suitable/clean water and aquatic resources used by local communities. •Reduction in water availability for other water beneficial uses of local communities (e.g., use for cooking, bathing, washing).	Refer to MM10		x		Water use management plan
Water use	Storage and discharge of brine, effluent, other wastewaters and stormwater to surrounding waterways and marine waters from project activities and components, including: •Desalination facilities (i.e., brine). •Retention pond and mixing pit. •Sanitary wastewater treatment systems (e.g., toilets, washrooms, kitchens and buildings). •Process area surface runoff •TSS-laden waters. •Thermal oxidiser spent water. •Hydrotest waters.	•Effects on water quality with associated effects on ecological habitats, including: oPhysiological effects to aquatic fauna (e.g., clogging of gills with suspended solids, direct ingestion of contaminants, adsorption of contaminants to the surfaces of organisms, and bioaccumulation in the tissue of organisms). oHabitat deterioration reducing viable habitats for fauna and increasing competition. oAltered species composition and abundance. Reduced suitable/clean water and aquatic resources used by local communities. •Reduced suitable/clean water and aquatic resources used by local communities. •Reduction in water availability for other water beneficial uses of local communities (e.g., use for cooking, bathing, washing).	MM37	Operate sewage treatment plant(s) in accordance with the manufacturer’s specifications.	x		Water use management plan
Water use	Storage and discharge of brine, effluent, other wastewaters and stormwater to surrounding waterways and marine waters from project activities and components, including: •Desalination facilities (i.e., brine). •Retention pond and mixing pit. •Sanitary wastewater treatment systems (e.g., toilets, washrooms, kitchens and buildings). •Process area surface runoff •TSS-laden waters. •Thermal oxidiser spent water. •Hydrotest waters.	•Effects on water quality with associated effects on ecological habitats, including: oPhysiological effects to aquatic fauna (e.g., clogging of gills with suspended solids, direct ingestion of contaminants, adsorption of contaminants to the surfaces of organisms, and bioaccumulation in the tissue of organisms). oHabitat deterioration reducing viable habitats for fauna and increasing competition. oAltered species composition and abundance. Reduced suitable/clean water and aquatic resources used by local communities. •Reduced suitable/clean water and aquatic resources used by local communities. •Reduction in water availability for other water beneficial uses of local communities (e.g., use for cooking, bathing, washing)	MM38	Store potentially contaminated stormwater runoff and landfill leachate in wastewater pits only.Wastewater pits will be lined and designed in accordance with good industry practice. Contractors will: •Design pit as permanent infrastructure. •Continuously line pit bottom and sides. Liner materials shall limit hydraulic conductivity to no greater than 1x10 ⁻⁷ cm/s. •Equip pit shall with leak detection or groundwater monitoring wells if potable groundwater exists within 6 m of pit bottom. •Place pit within a fenced area. •Include wildlife deterrents on pit, where required.	x		Water use management plan
Water use	Storage and discharge of brine, effluent, other wastewaters and stormwater to surrounding waterways and marine waters from project activities and components, including: •Desalination facilities (i.e., brine). •Retention pond and mixing pit. •Sanitary wastewater treatment systems (e.g., toilets, washrooms, kitchens and buildings). •Process area surface runoff •TSS-laden waters. •Thermal oxidiser spent water. •Hydrotest waters.	•Effects on water quality with associated effects on ecological habitats, including: oPhysiological effects to aquatic fauna (e.g., clogging of gills with suspended solids, direct ingestion of contaminants, adsorption of contaminants to the surfaces of organisms, and bioaccumulation in the tissue of organisms). oHabitat deterioration reducing viable habitats for fauna and increasing competition. oAltered species composition and abundance. Reduced suitable/clean water and aquatic resources used by local communities. •Reduced suitable/clean water and aquatic resources used by local communities. •Reduction in water availability for other water beneficial uses of local communities (e.g., use for cooking, bathing, washing)	MM39	Line and monitor open ponds, ditches, channels, and pits that may convey or contain contaminated effluent to prevent contaminants from seeping into the surrounding soil.	x		Water use management plan

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Aspect	Cause of impact (activity/event)	Impact	MM ID	Management Measure	Project phase		Source
					Construction	Operation	
Water use	Storage and discharge of brine, effluent, other wastewaters and stormwater to surrounding waterways and marine waters from project activities and components, including: •Desalination facilities (i.e., brine). •Retention pond and mixing pit. •Sanitary wastewater treatment systems (e.g., toilets, washrooms, kitchens and buildings). •Process area surface runoff •TSS-laden waters. •Thermal oxidiser spent water. •Hydrotest waters.	•Effects on water quality with associated effects on ecological habitats, including: oPhysiological effects to aquatic fauna (e.g., clogging of gills with suspended solids, direct ingestion of contaminants, adsorption of contaminants to the surfaces of organisms, and bioaccumulation in the tissue of organisms). oHabitat deterioration reducing viable habitats for fauna and increasing competition. oAltered species composition and abundance. Reduced suitable/clean water and aquatic resources used by local communities. •Reduced suitable/clean water and aquatic resources used by local communities. •Reduction in water availability for other water beneficial uses of local communities (e.g., use for cooking, bathing, washing)	MM40	Operate and maintain wastewater treatment systems by trained and competent personnel, and according to manufacturer's specifications.	x		Water use management plan
Water use	Storage and discharge of brine, effluent, other wastewaters and stormwater to surrounding waterways and marine waters from project activities and components, including: •Desalination facilities (i.e., brine). •Retention pond and mixing pit. •Sanitary wastewater treatment systems (e.g., toilets, washrooms, kitchens and buildings). •Process area surface runoff •TSS-laden waters. •Thermal oxidiser spent water. •Hydrotest waters.	•Effects on water quality with associated effects on ecological habitats, including: oPhysiological effects to aquatic fauna (e.g., clogging of gills with suspended solids, direct ingestion of contaminants, adsorption of contaminants to the surfaces of organisms, and bioaccumulation in the tissue of organisms). oHabitat deterioration reducing viable habitats for fauna and increasing competition. oAltered species composition and abundance. Reduced suitable/clean water and aquatic resources used by local communities. •Reduced suitable/clean water and aquatic resources used by local communities. •Reduction in water availability for other water beneficial uses of local communities (e.g., use for cooking, bathing, washing)	MM41	Verify that effluents from nearshore marine construction and support vessels comply with relevant regulations (see Section 2) prior to discharge.	x		Water use management plan
Water use	Storage and discharge of brine, effluent, other wastewaters and stormwater to surrounding waterways and marine waters from project activities and components, including: •Desalination facilities (i.e., brine). •Retention pond and mixing pit. •Sanitary wastewater treatment systems (e.g., toilets, washrooms, kitchens and buildings). •Process area surface runoff •TSS-laden waters. •Thermal oxidiser spent water. •Hydrotest waters.	•Effects on water quality with associated effects on ecological habitats, including: oPhysiological effects to aquatic fauna (e.g., clogging of gills with suspended solids, direct ingestion of contaminants, adsorption of contaminants to the surfaces of organisms, and bioaccumulation in the tissue of organisms). oHabitat deterioration reducing viable habitats for fauna and increasing competition. oAltered species composition and abundance. Reduced suitable/clean water and aquatic resources used by local communities. •Reduced suitable/clean water and aquatic resources used by local communities. •Reduction in water availability for other water beneficial uses of local communities (e.g., use for cooking, bathing, washing)	MM42	Store and transfer discharges produced by marine facilities and vessels that cannot be discharged to the environment to an approved onshore facility in accordance with relevant legislation, guidelines, and standards for treatment, reuse, recycling, or disposal of onboard vessel waste.	x		Water use management plan
Water use	Transport, storage, and handling of hazardous materials	Reduced water quality due to contamination of groundwater from hazardous substances and chemicals.	MM43	Treat stormwater runoff contaminated with hydrocarbons through an oil/water separation system able to achieve environment permit criteria.	x		Water use management plan
Water use	Transport, storage, and handling of hazardous materials	Reduced water quality due to contamination of groundwater from hazardous substances and chemicals.	Refer to MM02		x		Water use management plan
Hydrotesting	Conduct hydrotesting during construction	•Reduced water quality (i.e., due to inputs of freshwater, nutrients and chemical contaminants) in Caution Bay, with subsequent effects on nearshore marine aquatic habitats and species. •Increased suspension of sea floor particulates leading to increased turbidity in Caution Bay during direct discharge.	MM44	Perform controlled discharge of hydrotest water to prevent erosion and increases in turbidity when directly discharging to Caution Bay.	x		Hydrotesting management plan
Hydrotesting	Conduct hydrotesting during construction	•Reduced water quality (i.e., due to inputs of freshwater, nutrients and chemical contaminants) in Caution Bay, with subsequent effects on nearshore marine aquatic habitats and species. •Increased suspension of sea floor particulates leading to increased turbidity in Caution Bay during direct discharge.	MM45	Use screens for hydrotest water abstractions to prevent fish entry and reduce potential losses due to entrainment or impingement.	x		Hydrotesting management plan
Hydrotesting	Conduct hydrotesting during construction	•Reduced water quality (i.e., due to inputs of freshwater, nutrients and chemical contaminants) in Caution Bay, with subsequent effects on nearshore marine aquatic habitats and species. •Increased suspension of sea floor particulates leading to increased turbidity in Caution Bay during direct discharge.	MM46	Consider use of chemicals in hydrotest water to meet discharge criteria as specified in Section 5 of this Plan. Use of chemicals will be subject to ExxonMobil review and approval.	x		Hydrotesting management plan

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Aspect	Cause of impact (activity/event)	Impact	MM ID	Management Measure	Project phase		Source
					Construction	Operation	
Hydrotesting	Conduct hydrotesting during construction	•Reduced water quality (i.e., due to inputs of freshwater, nutrients and chemical contaminants) in Caution Bay, with subsequent effects on nearshore marine aquatic habitats and species. •Increased suspension of sea floor particulates leading to increased turbidity in Caution Bay during direct discharge.	MM47	Use break tanks or energy dissipators for direct discharge flow to Caution Bay.	x		Hydrotesting management plan
Hydrotesting	Conduct hydrotesting during construction	•Reduced water quality (i.e., due to inputs of freshwater, nutrients and chemical contaminants) in Caution Bay, with subsequent effects on nearshore marine aquatic habitats and species. •Increased suspension of sea floor particulates leading to increased turbidity in Caution Bay during direct discharge.	MM48	Model dispersion characteristics of hydrotest water in Caution Bay prior to discharge if necessary.	x		Hydrotesting management plan
Hydrotesting	Conduct hydrotesting during construction	•Reduced water quality (i.e., due to inputs of freshwater, nutrients and chemical contaminants) in Caution Bay, with subsequent effects on nearshore marine aquatic habitats and species. •Increased suspension of sea floor particulates leading to increased turbidity in Caution Bay during direct discharge.	MM49	Discharge of hydrotest waters in accordance with industry good practice for system gauging, hydrotesting and discharge to meet environment permit criteria.	x		Hydrotesting management plan
Hydrotesting	Conduct hydrotesting during construction	•Reduced water quality (i.e., due to inputs of freshwater, nutrients and chemical contaminants) in Caution Bay, with subsequent effects on nearshore marine aquatic habitats and species. •Increased suspension of sea floor particulates leading to increased turbidity in Caution Bay during direct discharge.	MM50	Conduct toxicity testing using recognised test methods, and use holding ponds to provide time for the toxicity of the water to decrease if necessary.	x		Hydrotesting management plan
Hydrotesting	Conduct hydrotesting during construction	•Reduced water quality (i.e., due to inputs of freshwater, nutrients and chemical contaminants) in Caution Bay, with subsequent effects on nearshore marine aquatic habitats and species. •Increased suspension of sea floor particulates leading to increased turbidity in Caution Bay during direct discharge.	MM51	Minimise chemical use and exposure by reducing the time that test water remains in the equipment or pipeline and carefully selecting chemical additives based on dose concentration, toxicity, biodegradability, bioavailability, and bioaccumulation potential.	x		Hydrotesting management plan
Hydrotesting	Conduct hydrotesting during construction	•Reduced water quality (i.e., due to inputs of freshwater, nutrients and chemical contaminants) in Caution Bay, with subsequent effects on nearshore marine aquatic habitats and species. •Increased suspension of sea floor particulates leading to increased turbidity in Caution Bay during direct discharge.	MM52	Monitor hydrotesting water quality before discharge and treat to meet the discharge limits.	x		Hydrotesting management plan
Hydrotesting	Conduct hydrotesting during construction	•Reduced water quality (i.e., due to inputs of freshwater, nutrients and chemical contaminants) in Caution Bay, with subsequent effects on nearshore marine aquatic habitats and species. •Increased suspension of sea floor particulates leading to increased turbidity in Caution Bay during direct discharge.	MM53	Minimise hydrotest water discharge by reusing it for multiple hydrotests to reduce the need for freshwater and chemical additives, where reasonably practicable.	x		Hydrotesting management plan
Hydrotesting	Conduct hydrotesting during construction	•Reduced water quality (i.e., due to inputs of freshwater, nutrients and chemical contaminants) in Caution Bay, with subsequent effects on nearshore marine aquatic habitats and species. •Increased suspension of sea floor particulates leading to increased turbidity in Caution Bay during direct discharge.	MM54	Minimise and conserve freshwater and marine use in accordance with good international industry practice by considering: •Facility water balances. •Design and execution measures to reduce water consumption in core facilities and activities, including water reuse and water recycling – e.g. stormwater, hydrotest water, treated wastewater. •Water use monitoring, including data management. •Continuous improvement, including use of benchmark data to gauge relative performance. •Reporting. •Awareness training.	x		Hydrotesting management plan
Air quality	Construction activities, including vegetation clearing, excavation of foundations, construction of the new trains at the LNG Plant and construction of temporary facilities (e.g., laydown areas, offices, workshops, a construction camp and concrete batching plants).	Dust emissions creating nuisance, aesthetic, and health impacts on humans	MM55	Limit erosion and dust effects of exposed soil and spoil material.	x		EIS Chapter 11, Air Quality and Greenhouse Gas Emissions management plan
Air quality	Construction activities, including vegetation clearing, excavation of foundations, construction of the new trains at the LNG Plant and construction of temporary facilities (e.g., laydown areas, offices, workshops, a construction camp and concrete batching plants).	Dust emissions creating nuisance, aesthetic, and health impacts on humans	MM56	Stabilise exposed areas susceptible to wind erosion using industry good practice measures such as water (non-saline), agglomerating agents, temporary grass/hydro-mulch or mulch where appropriate.	x		EIS Chapter 11, Air Quality and Greenhouse Gas Emissions management plan
Air quality	Construction activities, including vegetation clearing, excavation of foundations, construction of the new trains at the LNG Plant and construction of temporary facilities (e.g., laydown areas, offices, workshops, a construction camp and concrete batching plants).	Dust emissions creating nuisance, aesthetic, and health impacts on humans	MM57	Control speed limits via posted speed limit signs on project unsealed roads and keep vehicles to marked trafficable areas that will be maintained in a damp and compacted condition, where practicable.	x		EIS Chapter 11, Air Quality and Greenhouse Gas Emissions management plan

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Aspect	Cause of impact (activity/event)	Impact	MM ID	Management Measure	Project phase		Source
					Construction	Operation	
Air quality	Construction activities, including vegetation clearing, excavation of foundations, construction of the new trains at the LNG Plant and construction of temporary facilities (e.g., laydown areas, offices, workshops, a construction camp and concrete batching plants).	Dust emissions creating nuisance, aesthetic, and health impacts on humans	MM58	Use cleared vegetation where practicable for dust control and reinstatement.	x		EIS Chapter 11, Air Quality and Greenhouse Gas Emissions management plan
Air quality	Use of diesel-powered machinery during construction including trucks, excavators and cranes, and from the transport of workers and equipment.	Reduced air quality, with consequent community and Project nuisance.	MM59	Select construction equipment based on industry good practice.	x		EIS Chapter 11, Air Quality and Greenhouse Gas Emissions management plan
Air quality	Use of diesel-powered machinery during construction including trucks, excavators and cranes, and from the transport of workers and equipment.	Reduced air quality, with consequent community and Project nuisance.	MM60	Locate fixed and mobile equipment (e.g., generators) with consideration of local people (generally at a minimum distance of 500 meters from residences or other sensitive receptors, except where otherwise agreed by ExxonMobil).	x		EIS Chapter 11, Air Quality and Greenhouse Gas Emissions management plan
Air quality	Use of diesel-powered machinery during construction including trucks, excavators and cranes, and from the transport of workers and equipment.	Reduced air quality, with consequent community and Project nuisance.	MM61	Service diesel-powered equipment regularly.	x		EIS Chapter 11, Air Quality and Greenhouse Gas Emissions management plan
Air quality	Use of diesel-powered machinery during construction including trucks, excavators and cranes, and from the transport of workers and equipment.	Reduced air quality, with consequent community and Project nuisance.	MM62	Maintain construction vehicles and equipment in order to limit emissions and remove from service any equipment from which emissions are visibly excessive.	x		EIS Chapter 11, Air Quality and Greenhouse Gas Emissions management plan
Air quality	Industrial waste incineration	Impairment of ambient air quality.	MM63	Design high temperature incinerators: •Commensurate with proposed waste inventories. •To meet the intent of relevant emission limits in US EPA 40 CFR Part 60 Subpart CCCC (Standards of Performance for Commercial and Industrial Solid Waste Incineration Units). •With a dual combustion chamber on temporary incinerators that maintains a minimum one second retention time and a minimum temperature of 850°C in the secondary chamber. •With a carbon monoxide continuous emissions monitoring system on temporary and permanent incinerators.	x		EIS Chapter 11, Air Quality and Greenhouse Gas Emissions management plan
Air quality	Industrial waste incineration	Impairment of ambient air quality.	MM64	Prepare Operating Procedures for temporary incinerators to be utilised during construction. Operating Procedures will detail operational and monitoring/record keeping criteria.	x		EIS Chapter 11, Air Quality and Greenhouse Gas Emissions management plan
Air quality	Industrial waste incineration	Impairment of ambient air quality.	MM65	Operate incinerators in accordance with good industry practice guidance.	x		EIS Chapter 11, Air Quality and Greenhouse Gas Emissions management plan
Air quality	The primary air emissions during operations will be from burning of fuel gas in gas turbines for power generation and to drive compressors, as well as from flaring. Small quantities of fugitive emissions of VOCs from the LNG Plant and the Project facilities will also be generated.	Generation of emissions.	MM66	Emissions to air from the operation of the Project will be mitigated through engineered solutions that will be incorporated into the design. Such measures include: •Design will have zero routine flaring as per the Company Project Environmental Standard for Greenhouse Gas. •A 'smokeless' flare design will apply to normal operation. •Low NO _x turbines will be used in the LNG Plant. •Turbine generators will use dry, low-emissions technology to maintain NO _x and CO concentrations at less than 25 ppm. •LNG storage tanks will be of full-containment design, or full-integrity design, in accordance with Good International Industry Practice. •Flare facilities will be designed to minimise fugitive emissions. •Flare facilities will include an emergency detection and shutdown system.	x	x	EIS Chapter 11
Air quality	The primary air emissions during operations will be from burning of fuel gas in gas turbines for power generation and to drive compressors, as well as from flaring. Small quantities of fugitive emissions of VOCs from the LNG Plant and the Project facilities will also be generated.	Generation of emissions.	MM67	BTEX emissions from acid gas removal will be treated by thermal destruction or good industry practice.	x	x	EIS Chapter 11
Air quality	The primary air emissions during operations will be from burning of fuel gas in gas turbines for power generation and to drive compressors, as well as from flaring. Small quantities of fugitive emissions of VOCs from the LNG Plant and the Project facilities will also be generated.	Generation of emissions.	MM68	Valves, pipes and tanks will be regularly inspected and maintained to reduce fugitive VOCs emissions.	x	x	EIS Chapter 11
Air quality	Construction activities, including vegetation clearing, excavation of foundations, construction of the new trains at the LNG Plant and construction of temporary facilities (e.g., laydown areas, offices, workshops, a construction camp and concrete batching plants).	Dust emissions creating nuisance, aesthetic, and health impacts on humans	Refer to MM60		x		Air Quality and Greenhouse Gas Management Plan
Greenhouse gas emissions	Solid waste incineration	Scope 1 GHG emissions	MM69	Avoid the use of chemicals and hazardous materials subject to international bans or phase-outs consistent with the following agreements: •Stockholm Convention on Persistent Organic Pollutants. •Montreal Protocol on Substances that Deplete the Ozone Layer. •Rotterdam Convention of Prior Informed Consent for Certain Hazardous Chemicals and Pesticides in International Trade.	x		Air Quality and Greenhouse Gas Management Plan
Greenhouse gas emissions	Combustion of diesel by plant and equipment	Scope 1 GHG emissions	MM70	Fit low nitrogen oxides combustion equipment on gas turbine generators.	x		Air Quality and Greenhouse Gas Management Plan
Greenhouse gas emissions	Portable power generators	Scope 1 GHG emissions	MM71	Minimise the use of temporary diesel power generator units by connecting to the existing gas turbine generators for electrical power supply or leverage grid power (which is natural gas sourced from PNG LNG), where practicable.	x		Air Quality and Greenhouse Gas Management Plan; EIS Chapter 15
Greenhouse gas emissions	Portable power generators	Scope 1 GHG emissions	MM72	Source equipment and materials locally, where practicable, to minimise transport related GHG emissions.	x		Air Quality and Greenhouse Gas Management Plan
Greenhouse gas emissions	Portable power generators	Scope 1 GHG emissions	MM73	Consider the GHG implications of modularisation during the construction planning process.	x		Air Quality and Greenhouse Gas Management Plan; EIS Chapter 15
Greenhouse gas emissions	Portable power generators	Scope 1 GHG emissions	MM74	Implement vehicle speed limits on site.	x		Air Quality and Greenhouse Gas Management Plan

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					Construction	Operation	
Greenhouse gas emissions	Portable power generators	Scope 1 GHG emissions	MM75	Reduce idling times of trucks at construction sites through efficient traffic management.	x		Air Quality and Greenhouse Gas Management Plan
Greenhouse gas emissions	Portable power generators	Scope 1 GHG emissions	MM76	Maintain roads to avoid meandering of vehicles on roads.	x		Air Quality and Greenhouse Gas Management Plan
Greenhouse gas emissions	Portable power generators	Scope 1 GHG emissions	MM77	Minimise gradients of haul roads to reduce fuel consumption.	x		Air Quality and Greenhouse Gas Management Plan
Greenhouse gas emissions	Portable power generators	Scope 1 GHG emissions	Refer to MM62		x		Air Quality and Greenhouse Gas Management Plan
Greenhouse gas emissions	Portable power generators	Scope 1 GHG emissions	MM78	Schedule deliveries and activities to minimise distances travelled as far as practicable.	x		Air Quality and Greenhouse Gas Management Plan
Greenhouse gas emissions	Portable power generators	Scope 1 GHG emissions	MM79	Track and report on GHG emissions and associated activity data (i.e., fuel consumption) to assist in identifying key emission sources and appropriate targeting of mitigation measures.	x		Air Quality and Greenhouse Gas Management Plan; EIS Chapter 15
Noise	•Vegetation (in the laydown area) and topsoil removal using bulldozers and scrapers. •Bulk earthworks and platform construction using front end loaders, excavators, backhoes, graders, rollers, dump trucks and water trucks. •Construction of trains (installation and operation of concrete and asphalt batching plants and installation of structures at the LNG Plant using heavy machinery).	Temporary elevations in the noise profile with consequent community and project nuisance, and associated fauna impacts.	MM80	Maintain construction vehicles and equipment to limit noise emissions.	x		EIS Chapter 11
Noise	•Vegetation (in the laydown area) and topsoil removal using bulldozers and scrapers. •Bulk earthworks and platform construction using front end loaders, excavators, backhoes, graders, rollers, dump trucks and water trucks. •Construction of trains (installation and operation of concrete and asphalt batching plants and installation of structures at the LNG Plant using heavy machinery).	Temporary elevations in the noise profile with consequent community and project nuisance, and associated fauna impacts.	MM81	Limit heavy construction works at night where practicable.	x		EIS Chapter 11
Noise	•Vegetation (in the laydown area) and topsoil removal using bulldozers and scrapers. •Bulk earthworks and platform construction using front end loaders, excavators, backhoes, graders, rollers, dump trucks and water trucks. •Construction of trains (installation and operation of concrete and asphalt batching plants and installation of structures at the LNG Plant using heavy machinery).	Temporary elevations in the noise profile with consequent community and project nuisance, and associated fauna impacts.	MM82	Locate generators and other 'fixed' noise sources as far as practicable from adjacent sensitive receptors.	x		EIS Chapter 11
Noise	•Vegetation (in the laydown area) and topsoil removal using bulldozers and scrapers. •Bulk earthworks and platform construction using front end loaders, excavators, backhoes, graders, rollers, dump trucks and water trucks. •Construction of trains (installation and operation of concrete and asphalt batching plants and installation of structures at the LNG Plant using heavy machinery).	Temporary elevations in the noise profile with consequent community and project nuisance, and associated fauna impacts.	MM83	Manage potential noise complaints via the existing grievance management system.	x		EIS Chapter 11
Noise	•Vegetation (in the laydown area) and topsoil removal using bulldozers and scrapers. •Bulk earthworks and platform construction using front end loaders, excavators, backhoes, graders, rollers, dump trucks and water trucks. •Construction of trains (installation and operation of concrete and asphalt batching plants and installation of structures at the LNG Plant using heavy machinery).	Temporary elevations in the noise profile with consequent community and project nuisance, and associated fauna impacts.	MM84	Include noise in site induction training with details for worker's responsibilities in relation to noise emissions.	x		EIS Chapter 11
Noise	•Vegetation (in the laydown area) and topsoil removal using bulldozers and scrapers. •Bulk earthworks and platform construction using front end loaders, excavators, backhoes, graders, rollers, dump trucks and water trucks. •Construction of trains (installation and operation of concrete and asphalt batching plants and installation of structures at the LNG Plant using heavy machinery).	Temporary elevations in the noise profile with consequent community and project nuisance, and associated fauna impacts.	MM85	Enforce speed limits in and around the site to minimise traffic noise.	x		EIS Chapter 11
Noise	Operation of noise generating equipment located within the new trains and associated piping, including sources such as that associated with the new flares, ancillary plant required to prepare the gas for export, upgrades to the boil-off gas system, refrigeration and power generation.	Sudden, intrusive noise to the area surrounding the LNG Plant site	MM86	Implement noise mitigation for gas flares.		x	EIS Chapter 11
Noise	Operation of noise generating equipment located within the new trains and associated piping, including sources such as that associated with the new flares, ancillary plant required to prepare the gas for export, upgrades to the boil-off gas system, refrigeration and power generation.	Sudden, intrusive noise to the area surrounding the LNG Plant site	MM87	Design noise generating equipment associated with the new plant (e.g., refrigeration, main generation, and boilers) with noise controls, or with the flexibility for noise controls to be incorporated in the future, if required, such as equipment enclosures, noise screens, acoustic silencers and pile lagging.		x	EIS Chapter 11
Terrestrial biodiversity	Construction activities, such as vegetation clearing and bulk earthworks	Habitat loss, barrier effects, and edge effects.	MM88	Limit clearing of riparian vegetation to the areas necessary to undertake construction activities safely. Prevent construction personnel from entering areas outside of project-related activities to minimise damage to vegetation.	x		Biodiversity Management Plan, EIS Chapter 11
Terrestrial biodiversity	Construction activities, such as vegetation clearing and bulk earthworks	Habitat loss, barrier effects, and edge effects.	MM89	Where tree removal is necessary, limit damage to surrounding habitats by felling trees away from existing stands where practicable taking into account the value and safety of the areas where the trees are being felled into.	x		Biodiversity Management Plan, EIS Chapter 11
Terrestrial biodiversity	Construction activities, such as vegetation clearing and bulk earthworks	Habitat loss, barrier effects, and edge effects.	MM90	Limit the scraping of standing tree trunks by machinery as far as practicable.	x		Biodiversity Management Plan, EIS Chapter 11

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					Construction	Operation	
Terrestrial biodiversity	Construction activities, such as vegetation clearing and bulk earthworks	Erosion, movement of soil and spoil.	MM91	Limit clearing of riparian vegetation to the areas necessary to undertake construction activities safely. Prevent construction personnel from entering areas outside of project-related activities to minimise damage to vegetation.	x		Biodiversity Management Plan
Terrestrial biodiversity	Construction activities, such as vegetation clearing and bulk earthworks	Erosion, movement of soil and spoil.	MM92	Where practicable, revegetate promptly areas no longer required for construction or support services.	x		Biodiversity Management Plan, EIS Chapter 11
Terrestrial biodiversity	Construction activities, such as vegetation clearing and bulk earthworks	Erosion, movement of soil and spoil.	MM93	Establish and enforce sediment and erosion control measures, as part of the updated Erosion Control Plan, that limits the mobilisation and dispersion of sediment into freshwater and estuarine environments particularly in relation to site preparation earthworks watercourse diversions, site drainage design and road crossings.	x		Biodiversity Management Plan, EIS Chapter 11
Terrestrial biodiversity	Construction activities, such as vegetation clearing and bulk earthworks	Erosion, movement of soil and spoil.	MM94	Update the existing reclamation plan for the Project that includes the regeneration of natural vegetation communities, wetland substrates and savanna as close to natural levels as possible through seed collection and/or use of topsoil as a seed resource.	x		Biodiversity Management Plan, EIS Chapter 11
Terrestrial biodiversity	Construction activities, such as vegetation clearing and bulk earthworks	Erosion, movement of soil and spoil.	MM95	Where practicable strip and salvage topsoil. Where salvaged, protect topsoil from loss or degradation. Use topsoil in reclamation management plan.	x		Biodiversity Management Plan, EIS Chapter 11
Terrestrial biodiversity	Construction activities, such as vegetation clearing and bulk earthworks	Increased risk of fire.	MM96	Undertake community consultation regarding burning in the vicinity of the LNG Facilities site.	x		Biodiversity Management Plan
Terrestrial biodiversity	Construction activities, such as vegetation clearing and bulk earthworks	Increased risk of dieback.	Refer to Invasive Species, Pathogens and Pests Management Plan.		x		Biodiversity Management Plan
Terrestrial biodiversity	Construction activities, such as vegetation clearing and bulk earthworks	Increased risk of dieback.	Refer to MM34		x		Biodiversity Management Plan
Terrestrial biodiversity	Construction activities, such as vegetation clearing and bulk earthworks	Changes to hydrology.	Refer to Water Use and Effluent Discharges Management Plan.		x		Biodiversity Management Plan
Terrestrial biodiversity	Construction activities, such as vegetation clearing and bulk earthworks	Changes to hydrology.	Refer to Acid Sulphate Soils Management Plan.		x		Biodiversity Management Plan
Terrestrial biodiversity	Construction activities, such as vegetation clearing and bulk earthworks	Changes to hydrology.	Refer to MM34		x		Biodiversity Management Plan
Terrestrial biodiversity	Construction activities, such as vegetation clearing and bulk earthworks	Changes to hydrology.	MM97	At new or improved road crossings, maintain connectivity in watercourses for wet season flow to enable fish migration.	x	x	Biodiversity Management Plan, EIS Chapter 11
Terrestrial biodiversity	Construction activities, such as vegetation clearing and bulk earthworks	•Potential for increased littering of the landscape from blown material. •Contamination of soil, groundwater, surface water and marine water. •Attraction of feral/pest animals.	MM98	Provide good industry practice containment wherever hazardous or dangerous goods are stored or used.	x	x	Biodiversity Management Plan, EIS Chapter 11
Terrestrial biodiversity	Construction activities, such as vegetation clearing and bulk earthworks	•Potential for increased littering of the landscape from blown material. •Contamination of soil, groundwater, surface water and marine water. •Attraction of feral/pest animals.	Refer to Spill Prevention and Response Management Plan and train staff in their responsibilities under the plan.		x	x	Biodiversity Management Plan, EIS Chapter 11
Terrestrial biodiversity	Construction activities, such as vegetation clearing and bulk earthworks	•Potential for increased littering of the landscape from blown material. •Contamination of soil, groundwater, surface water and marine water. •Attraction of feral/pest animals.	Refer to Water Use and Effluent Discharges Management Plan.		x		Biodiversity Management Plan
Terrestrial biodiversity	Construction activities, such as vegetation clearing and bulk earthworks	•Potential for increased littering of the landscape from blown material. •Contamination of soil, groundwater, surface water and marine water. •Attraction of feral/pest animals.	Refer to Hazardous Materials Management Plan.		x		Biodiversity Management Plan
Terrestrial biodiversity	Construction activities, such as vegetation clearing and bulk earthworks	Noise, lights, and other disturbance to fauna.	Refer to Noise Management Plan.		x		Biodiversity Management Plan
Terrestrial biodiversity	Construction activities, such as vegetation clearing and bulk earthworks	Noise, lights, and other disturbance to fauna.	MM99	Where practicable, direct lights at project facilities to minimise shine into surrounding forest.	x		Biodiversity Management Plan
Terrestrial biodiversity	Construction activities, such as vegetation clearing and bulk earthworks	Dust.	Refer to MM58		x	x	Biodiversity Management Plan, EIS Chapter 11
Terrestrial biodiversity	Construction activities, such as vegetation clearing and bulk earthworks	Dust.	Refer to Air Quality, Greenhouse Gas and Energy Efficiency Management Plan.		x		Biodiversity Management Plan
Terrestrial biodiversity	Construction activities, such as vegetation clearing and bulk earthworks	Increase in invasive species with subsequent impacts on fauna.	Refer to Invasive Species, Pathogens and Pests Management Plan.		x		Biodiversity Management Plan
Terrestrial biodiversity	Construction activities, such as vegetation clearing and bulk earthworks	Increase in invasive species with subsequent impacts on fauna.	MM100	Establish and enforce speed limits for project traffic on all roads. Liaise with government agencies and local villages with regard to general road safety and traffic regulation.	x	x	Biodiversity Management Plan, EIS Chapter 11
Terrestrial biodiversity	Construction activities, such as vegetation clearing and bulk earthworks	Increase in invasive species with subsequent impacts on fauna.	MM101	Limit machinery and vehicle movements to defined works areas and designated project roads.	x	x	Biodiversity Management Plan, EIS Chapter 11
Terrestrial biodiversity	Construction activities, such as vegetation clearing and bulk earthworks	Increased risk of invasive species (weeds and plant pathogens) with subsequent effects on native vegetation	Refer to Invasive Species, Pathogens and Pests Management Plan.		x		Biodiversity Management Plan
Terrestrial biodiversity	Construction activities, such as vegetation clearing and bulk earthworks	Increased risk of invasive species (weeds and plant pathogens) with subsequent effects on native vegetation	MM102	Update and enforce pest and weed management procedures for the Project including procedures to prohibit project workers or contractors from establishing any gardens, introducing, keeping or transporting any plants, seeds or animals (including fish) within the perimeter fence. This plan would include provisions such as worker education to assist in recognition and eradication of pest species and measures specific to the Project.	x	x	Biodiversity Management Plan, EIS Chapter 11
Terrestrial biodiversity	Construction activities, such as vegetation clearing and bulk earthworks	Increased risk of invasive species (weeds and plant pathogens) with subsequent effects on native vegetation	MM103	Update and enforce project-wide quarantine management procedures, including inspection of equipment, machinery and consumables such as pipe and imported rock.	x	x	Biodiversity Management Plan, EIS Chapter 11
Marine biodiversity	Construction activities.	Vessel collisions with marine fauna.	MM104	Report ad hoc marine fauna observation to the LNG Plant environment team and subsequent avoidance actions implemented as practicable (e.g., wait or reduce thruster power), until large fauna (i.e., dolphins and whales) moves from the area (i.e., 200 m from the vessels path).	x		Biodiversity Management Plan
Marine biodiversity	Construction activities.	Vessel discharge.	Refer to MM35		x		Biodiversity Management Plan

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Management Measures Register

Aspect	Cause of impact (activity/event)	Impact	MM ID	Management Measure	Project phase		Source
					Construction	Operation	
Marine biodiversity	Construction activities.	Vessel discharge.	MM105	Adhere to the relevant requirements of the Marine Pollution (Ships and Installations) Act 2013 and Marine Pollution (Sea Dumping) Act 2013.	x		Biodiversity Management Plan
Marine biodiversity	Construction activities.	Vessel discharge.	MM106	Store and transfer onboard wastes to an approved onshore facility for treatment, reuse, recycling, or disposal that cannot be dumped due to relevant legislation, guidelines and standards.	x		Biodiversity Management Plan
Marine biodiversity	Construction activities.	Underwater noise.	MM107	Employ 'soft start' procedures (i.e., gradual increase from lower noise emissions to higher noise emissions), to allow mobile marine fauna the opportunity to move away before sound levels reach a maximum.	x		Biodiversity Management Plan
Marine biodiversity	Construction activities.	Light.	MM108	Design lighting arrays to minimise visibility of the LNG facilities (including marine facilities) from Idihl Island.	x		Biodiversity Management Plan
Marine biodiversity	Construction activities.	Introduction of invasive aquatic organisms.	MM109	Update and continue to implement the Project-wide quarantine management plan.	x		Biodiversity Management Plan
Marine biodiversity	Accidental spillage of hazardous substances.	Lethal or sub-lethal contamination effects.	Refer to Spill Prevention and Response Management Plan and train staff in their responsibilities under		x		Biodiversity Management Plan
Marine biodiversity	Accidental spillage of hazardous substances.	Lethal or sub-lethal contamination effects.	Refer to Hazardous Materials Management Plan.		x		Biodiversity Management Plan
Marine biodiversity	Installation of CALM buoy.	Marine habitat or sea floor disturbance.	MM110	Implement measures to minimise sediment release during CALM buoy placement, such as silt curtains, setting a lower limit of particle size for material used, and/or other industry good practice management.	x		Biodiversity Management Plan
Marine biodiversity	Accidental release from retention pond mixing pit without treatment.	Wastewater discharge.	MM111	Prohibit works from exceeding the design disturbance width, and enforce boundaries through distribution of worker awareness information.	x		Biodiversity Management Plan
Marine biodiversity	Accidental release from retention pond mixing pit without treatment.	Wastewater discharge.	MM112	Mix wastewater streams entering the retention pond mixing pit to assist with dilutions.	x		Biodiversity Management Plan
Marine biodiversity	Additional employment.	Increased risk of hunting and collection of flora and fauna.	MM113	Manage project discharges under a construction Environment Permit.	x		Biodiversity Management Plan
Marine biodiversity	Additional employment.	Increased risk of hunting and collection of flora and fauna.	MM114	Prohibit disturbance/harassment of wildlife, hunting of fauna, gathering of plants or bush foods, collection of firewood or possession of wildlife products by project workers or contractors while working, travelling in project vehicles, and residing in project field accommodation. Implement appropriate inductions and education to encourage staff to comply with regulations.	x		Biodiversity Management Plan, EIS Chapter 11
Marine biodiversity	Additional employment.	Increased risk of hunting and collection of flora and fauna.	MM115	During operations prohibit staff from disturbing migratory species and associated habitats, especially along perimeter fence adjacent to salt flat habitat.	x		Biodiversity Management Plan, EIS Chapter 11
Terrestrial and aquatic biodiversity	Removal or control of invasive species though the use of herbicides or pesticides.	Accidental poisoning of the environment through over spraying or spilling of chemicals resulting in: •Impacts to the habitat of local species. •Impacts to population of indigenous plant and animal species. •Impacts on the local seed banks and the overall quality of the soil. •Contamination of surface water bodies and groundwater, and •Impacts on workforce and local community health.	MM116	Apply approved pesticides and herbicides only as a last resort when other measures such as, in the case of weeds, mechanical slashing, mulching, removal and disposal are not effective or reasonably practicable on their own. Safety Data Sheets will be kept alongside the storage container for each pesticide stored on-site.	x		Invasive Species, Pathogens and Pests Management plan
Terrestrial biodiversity	Removal or control of invasive species though the use of herbicides or pesticides.	Accidental poisoning of the environment through over spraying or spilling of chemicals resulting in: •Impacts to the habitat of local species. •Impacts to population of indigenous plant and animal species. •Impacts on the local seed banks and the overall quality of the soil. •Contamination of surface water bodies and groundwater, and •Impacts on workforce and local community health.	MM117	Store, handle, apply and dispose of pesticides and herbicides in accordance with good industry practice and the Food and Agriculture Organization's International Code of Conduct on the Distribution and Use of Pesticides to avoid health risks to workers.	x		Invasive Species, Pathogens and Pests Management plan
Terrestrial biodiversity	Removal or control of invasive species though the use of herbicides or pesticides.	Accidental poisoning of the environment through over spraying or spilling of chemicals resulting in: •Impacts to the habitat of local species. •Impacts to population of indigenous plant and animal species. •Impacts on the local seed banks and the overall quality of the soil. •Contamination of surface water bodies and groundwater, and •Impacts on workforce and local community health.	MM118	Do not purchase, store, use, manufacture or trade in WHO Recommended Classification or Pesticides by Hazardous Class II (moderately hazardous) pesticides, unless the Project has appropriate controls on the manufacture, procurement or distribution and/or use of these chemicals.	x		Invasive Species, Pathogens and Pests Management plan
Terrestrial biodiversity	Removal or control of invasive species though the use of herbicides or pesticides.	Accidental poisoning of the environment through over spraying or spilling of chemicals resulting in: •Impacts to the habitat of local species. •Impacts to population of indigenous plant and animal species. •Impacts on the local seed banks and the overall quality of the soil. •Contamination of surface water bodies and groundwater, and •Impacts on workforce and local community health.	MM119	Undertake a risk assessment for each pesticide or herbicide which will be used in significant quantities within the Project area.	x		Invasive Species, Pathogens and Pests Management plan
Terrestrial biodiversity	Removal or control of invasive species though the use of herbicides or pesticides.	Accidental poisoning of the environment through over spraying or spilling of chemicals resulting in: •Impacts to the habitat of local species. •Impacts to population of indigenous plant and animal species. •Impacts on the local seed banks and the overall quality of the soil. •Contamination of surface water bodies and groundwater, and •Impacts on workforce and local community health.	MM120	Train relevant personnel to handle pesticides. Such personnel will be equipped with the appropriate equipment and facilities to handle, store, apply and dispose of these produced properly.	x		Invasive Species, Pathogens and Pests Management plan

Aspect	Cause of impact (activity/event)	Impact	MM ID	Management Measure	Project phase		Source
					Construction	Operation	
Terrestrial biodiversity	Removal or control of invasive species though the use of herbicides or pesticides.	Accidental poisoning of the environment through over spraying or spilling of chemicals resulting in: •Impacts to the habitat of local species. •Impacts to population of indigenous plant and animal species. •Impacts on the local seed banks and the overall quality of the soil. •Contamination of surface water bodies and groundwater, and •Impacts on workforce and local community health.	MM121	Store pesticides so that they are inaccessible to unauthorised and untrained personnel.	x		Invasive Species, Pathogens and Pests Management plan
Terrestrial biodiversity	Removal or control of invasive species though the use of herbicides or pesticides.	Accidental poisoning of the environment through over spraying or spilling of chemicals resulting in: •Impacts to the habitat of local species. •Impacts to population of indigenous plant and animal species. •Impacts on the local seed banks and the overall quality of the soil. •Contamination of surface water bodies and groundwater, and •Impacts on workforce and local community health.	MM122	Develop a pesticide application strategy that will: •Have a minimal effect on non-target species (native species e.g., small mammals). •Avoid or minimise damage to natural predators of the target species. •Avoid or minimise the risk associated with the development of resistance in invasive species.	x		Invasive Species, Pathogens and Pests Management plan
Terrestrial biodiversity	Removal or control of invasive species though the use of herbicides or pesticides.	Accidental poisoning of the environment through over spraying or spilling of chemicals resulting in: •Impacts to the habitat of local species. •Impacts to population of indigenous plant and animal species. •Impacts on the local seed banks and the overall quality of the soil. •Contamination of surface water bodies and groundwater, and •Impacts on workforce and local community health.	MM123	Strictly monitor the use of rodent poisons to avoid it being spread to the native small mammal population and/or causing the accidental mortalities of rodent predators.	x		Invasive Species, Pathogens and Pests Management plan
Terrestrial biodiversity	Importing of construction material from a local site or a foreign port contained with invasive species.	Accidental introduction/ spread of local invasive species into the Project Area resulting in: •Impacts to the habitat of local species. •Impacts to the population of indigenous plant and animal species. •Impacts on local agriculture and hunting practises and thus the health of local communities.	MM124	Prioritise the prevention of invasive species from entering into the Project area, followed by early detection and, where reasonably practicable, eradication.	x		Invasive Species, Pathogens and Pests Management plan
Terrestrial biodiversity	Importing of construction material from a local site or a foreign port contained with invasive species.	Accidental introduction/ spread of local invasive species into the Project Area resulting in: •Impacts to the habitat of local species. •Impacts to the population of indigenous plant and animal species. •Impacts on local agriculture and hunting practises and thus the health of local communities.	MM125	Establish and enforce a Project-wide risk-based invasive species management program, including prevention and control measures at point-of-origin and on-site treatments, and inspection program for containers and equipment on arrival to site.	x		Invasive Species, Pathogens and Pests Management plan
Terrestrial biodiversity	Importing of construction material from a local site or a foreign port contained with invasive species.	Accidental introduction/ spread of local invasive species into the Project Area resulting in: •Impacts to the habitat of local species. •Impacts to the population of indigenous plant and animal species. •Impacts on local agriculture and hunting practises and thus the health of local communities.	MM126	Inspect cargo, packaging, containers, break-bulk and ballast at the point of origin and ensure cleaning and fumigation are applied as necessary to ensure that there is no evidence of soil, animal or plant material.	x		Invasive Species, Pathogens and Pests Management plan
Terrestrial biodiversity	Importing of construction material from a local site or a foreign port contained with invasive species.	Accidental introduction/ spread of local invasive species into the Project Area resulting in: •Impacts to the habitat of local species. •Impacts to the population of indigenous plant and animal species. •Impacts on local agriculture and hunting practises and thus the health of local communities.	MM127	Treat and stamp timber packaging in line with the international standards for Phytosanitary Measures No 15 (ISPM15).	x		Invasive Species, Pathogens and Pests Management plan
Terrestrial biodiversity	Importing of construction material from a local site or a foreign port contained with invasive species.	Accidental introduction/ spread of local invasive species into the Project Area resulting in: •Impacts to the habitat of local species. •Impacts to the population of indigenous plant and animal species. •Impacts on local agriculture and hunting practises and thus the health of local communities.	MM128	Keep documentation to demonstrate the inspection, treatment and management of invasive species, and will be made available for inspections as required.	x		Invasive Species, Pathogens and Pests Management plan
Terrestrial and aquatic biodiversity	Importing of construction material from a local site or a foreign port contained with invasive species.	Accidental introduction/ spread of local invasive species into the Project Area resulting in: •Impacts to the habitat of local species. •Impacts to the population of indigenous plant and animal species. •Impacts on local agriculture and hunting practises and thus the health of local communities.	MM129	Prohibit project personnel and contractors from establishing gardens and from introducing, keeping or transporting plants, seeds or animals (including fish)at the LNG Plant site.	x		Invasive Species, Pathogens and Pests Management plan, Chapter 11
Terrestrial biodiversity	Importing of construction material from a local site or a foreign port contained with invasive species.	Accidental introduction/ spread of local invasive species into the Project Area resulting in: •Impacts to the habitat of local species. •Impacts to the population of indigenous plant and animal species. •Impacts on local agriculture and hunting practises and thus the health of local communities.	MM130	Notify ExxonMobil in the event of an on-site infection of an invasive species as a result of imported material or containers, and segregate and store (sealed if appropriate) on impenetrable ground and implement appropriate treatment measures.	x		Invasive Species, Pathogens and Pests Management plan

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Management Measures Register

Aspect	Cause of impact (activity/event)	Impact	MM ID	Management Measure	Project phase		Source
					Construction	Operation	
Terrestrial biodiversity	Movement of vehicles and machinery during construction.	Accidental introduction/ spread of local invasive species into the Project Area resulting in: •Impacts to the habitat of local species. •Impacts to the population of indigenous plant and animal species. •Impacts on local agriculture and hunting practises and thus the health of local communities.	MM131	Establish and enforce a Project-wide risk-based invasive species management program, including prevention and control measures at point-of-origin and on-site treatments, and inspection program for containers and equipment on arrival to site.	x		Invasive Species, Pathogens and Pests Management plan
Terrestrial biodiversity	Movement of vehicles and machinery during construction.	Accidental introduction/ spread of local invasive species into the Project Area resulting in: •Impacts to the habitat of local species. •Impacts to the population of indigenous plant and animal species. •Impacts on local agriculture and hunting practises and thus the health of local communities.	MM132	Keep documentation to demonstrate the inspection, treatment and management of invasive species, and will be made available for inspections as required.	x		Invasive Species, Pathogens and Pests Management plan
Terrestrial and aquatic biodiversity	Movement of vehicles and machinery during construction.	Accidental introduction/ spread of local invasive species into the Project Area resulting in: •Impacts to the habitat of local species. •Impacts to the population of indigenous plant and animal species. •Impacts on local agriculture and hunting practises and thus the health of local communities.	MM133	Implement a risk-based approach to weed management to reduce the spread of weeds.	x		Invasive Species, Pathogens and Pests Management plan, Chapter 11
Terrestrial biodiversity	Movement of vehicles and machinery during construction.	Accidental introduction/ spread of local invasive species into the Project Area resulting in: •Impacts to the habitat of local species. •Impacts to the population of indigenous plant and animal species. •Impacts on local agriculture and hunting practises and thus the health of local communities.	MM134	Notify ExxonMobil in the event of an on-site infection of an invasive species as a result of imported material or containers, and segregate and store (sealed if appropriate) on impenetrable ground and implement appropriate treatment measures.	x		Invasive Species, Pathogens and Pests Management plan
Terrestrial and aquatic biodiversity	Movement of vehicles and machinery during construction.	Accidental introduction/ spread of local invasive species into the Project Area resulting in: •Impacts to the habitat of local species. •Impacts to the population of indigenous plant and animal species. •Impacts on local agriculture and hunting practises and thus the health of local communities.	MM135	Implement worker education to assist in the recognition and eradication of pest species and other measures specific to the LNG Plant site.	x		Invasive Species, Pathogens and Pests Management plan, Chapter 11
Terrestrial and aquatic biodiversity	Movement of vehicles and machinery during construction.	Accidental introduction/ spread of local invasive species into the Project Area resulting in: •Impacts to the habitat of local species. •Impacts to the population of indigenous plant and animal species. •Impacts on local agriculture and hunting practises and thus the health of local communities.	MM136	Prohibit the disturbance or harassment of wildlife, hunting of fauna, gathering of plants or bush foods, and collection of firewood or possession of wildlife products by project workers or contractors. Enforced this prohibition while undertaking all activities associated with the Project, such as travelling in project vehicles and residing in project field accommodation.	x		Invasive Species, Pathogens and Pests Management plan, EIS Chapter 11
Terrestrial biodiversity	Movement of vehicles and machinery during construction.	Accidental introduction/ spread of local invasive species into the Project Area resulting in: •Impacts to the habitat of local species. •Impacts to the population of indigenous plant and animal species. •Impacts on local agriculture and hunting practises and thus the health of local communities.	MM137	Notify ExxonMobil in the event of an on-site infection of an invasive species as a result of imported material or containers, and segregate and store (sealed if appropriate) on impenetrable ground and implement appropriate treatment measures.	x		Invasive Species, Pathogens and Pests Management plan
Terrestrial biodiversity	Movement of vehicles and machinery during construction.	Accidental introduction/ spread of local invasive species into the Project Area resulting in: •Impacts to the habitat of local species. •Impacts to the population of indigenous plant and animal species. •Impacts on local agriculture and hunting practises and thus the health of local communities.	MM138	Strictly monitor the use of rodent poisons to avoid it being spread to the native small mammal population and/or causing the accidental mortalities of rodent predators.	x		Invasive Species, Pathogens and Pests Management plan
Waste	Generation of restricted and non-restricted waste.	•Creation of a waste disposal legacy. •Increased pressure on waste repositories used by the community. •Impact on community and worker health	MM139	Adopt a hierarchy approach to waste management by prioritising avoidance and reduction of waste in the first instance, followed by reuse, recycling and recovery, with treatment and disposal being the least favoured options.	x		Waste management plan, EIS Chapter 16
Waste	Generation of restricted and non-restricted waste.	•Creation of a waste disposal legacy. •Increased pressure on waste repositories used by the community. •Impact on community and worker health	MM140	Provide support to ExxonMobil led initiatives / opportunities for waste management synergies (including disposal options) with other operators, projects and government.	x		Waste management plan, EIS Chapter 16
Waste	Generation of restricted and non-restricted waste.	•Creation of a waste disposal legacy. •Increased pressure on waste repositories used by the community. •Impact on community and worker health	MM141	Consider opportunities to assist local entrepreneurs in the establishment of responsible waste management service providers which meet ExxonMobil minimum requirements.	x		Waste management plan, EIS Chapter 16
Waste	Generation of restricted and non-restricted waste.	•Creation of a waste disposal legacy. •Increased pressure on waste repositories used by the community. •Impact on community and worker health	MM142	Allow storage of waste as a temporary solution during the downstream construction phase only.	x		Waste management plan, EIS Chapter 16
Waste	Generation of restricted and non-restricted waste.	•Creation of a waste disposal legacy. •Increased pressure on waste repositories used by the community. •Impact on community and worker health	MM143	Provide appropriate personal protective equipment (PPE) to all workers associated with waste management duties and ensure it is worn correctly at all times.	x		Waste management plan, EIS Chapter 16

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Aspect	Cause of impact (activity/event)	Impact	MM ID	Management Measure	Project phase		Source
					Construction	Operation	
Waste	Generation of restricted and non-restricted waste.	•Creation of a waste disposal legacy. •Increased pressure on waste repositories used by the community. •Impact on community and worker health	MM144	Construct secure fences around all waste management infrastructure areas and only open during normal working hours.	x		Waste management plan, EIS Chapter 16
Waste	Generation of restricted and non-restricted waste.	•Creation of a waste disposal legacy. •Increased pressure on waste repositories used by the community. •Impact on community and worker health	MM145	Institute good housekeeping and operating practices, including inventory control to reduce amount of waste resulting from materials that are out of date, off specification, contaminated, damaged or excess to plant needs.	x		Waste management plan, EIS Chapter 16
Waste	Generation of restricted and non-restricted waste.	•Creation of a waste disposal legacy. •Increased pressure on waste repositories used by the community. •Impact on community and worker health	MM146	Develop and implement recycling plans which: •Evaluate waste production processes and identify potentially recyclable materials •Identify products that can be re-introduced into plant processes or activity at site •Identify potential waste streams into external markets •Establish recycling objectives and formal tracking of waste generation and recycling rates.	x		Waste management plan, EIS Chapter 16
Waste	Generation of restricted and non-restricted waste.	•Creation of a waste disposal legacy. •Increased pressure on waste repositories used by the community. •Impact on community and worker health	MM147	Train relevant personnel in storage, handling and disposal of waste.	x		Waste management plan, EIS Chapter 16
Waste	Collection, segregation and storage of restricted and non-restricted waste	•Accidental releases from collection, segregation or storage activities •Scavenging by animals, pests and rodents	MM148	Segregate waste according to the waste types defined in this Plan, to be compatible with the subsequent management of the wastes at the PNG Waste Management Facility, or by third party waste management contractors as required.	x		Waste management plan, EIS Chapter 16
Waste	Collection, segregation and storage of restricted and non-restricted waste	•Accidental releases from collection, segregation or storage activities •Scavenging by animals, pests and rodents	MM149	Segregate different sub-parts of wastes and subsequent shredding of the waste helps to reduce volume prior to incinerating, recycling or disposal to landfill, for example, applied to tyres through de-beading and shredding; and also crushing of empty drums.	x		Waste management plan, EIS Chapter 16
Waste	Collection, segregation and storage of restricted and non-restricted waste	•Accidental releases from collection, segregation or storage activities •Scavenging by animals, pests and rodents	MM150	Use different coloured and labelled waste containers for all segregated waste streams.	x		Waste management plan, EIS Chapter 16
Waste	Collection, segregation and storage of restricted and non-restricted waste	•Accidental releases from collection, segregation or storage activities •Scavenging by animals, pests and rodents	MM151	Waste collection and storage containers shall be: •Compatible with the waste being generated. •In good physical condition. •Colour coded for segregation. •Kept closed during storage. •Provided in adequate numbers and across locations. •Checked regulatory to avoid overfilling. •Labelled	x		Waste management plan, EIS Chapter 16
Waste	Collection, segregation and storage of restricted and non-restricted waste	•Accidental releases from collection, segregation or storage activities •Scavenging by animals, pests and rodents	MM152	Waste management sumps shall be routinely emptied as required and all recovered material appropriately managed as waste.	x		Waste management plan, EIS Chapter 16
Waste	Transportation of restricted and non- restricted waste	•Soil, groundwater, surface water and marine water contamination. •Littering of the landscape from blown material •Creation of waste disposal legacy •Impact on community and worker health •Community disturbance / nuisance.	MM153	Inspect trucks used for transportation of waste to ensure they are in good condition and that appropriate spill kits are carried where required.	x		Waste management plan, EIS Chapter 16
Waste	Transportation of restricted and non- restricted waste	•Soil, groundwater, surface water and marine water contamination. •Littering of the landscape from blown material •Creation of waste disposal legacy •Impact on community and worker health •Community disturbance / nuisance.	MM154	Use drivers that are qualified (i.e. have appropriate drivers license and training for the vehicles driven).	x		Waste management plan, EIS Chapter 16
Waste	Transportation of restricted and non- restricted waste	•Soil, groundwater, surface water and marine water contamination. •Littering of the landscape from blown material •Creation of waste disposal legacy •Impact on community and worker health •Community disturbance / nuisance.	MM155	Use International Organization for Standardization (ISO) tankers, double skinned tankers or equivalent to transport waste oil or chemical from ExxonMobil sites to approved third party facilities.	x		Waste management plan, EIS Chapter 16
Waste	Transportation of restricted and non- restricted waste	•Soil, groundwater, surface water and marine water contamination. •Littering of the landscape from blown material •Creation of waste disposal legacy •Impact on community and worker health •Community disturbance / nuisance.	MM156	Adequately line shipping containers with tough impermeable sheet, HDPE Liners or equivalent. Before drums or totes with waste oil, chemicals etc. are placed inside the shipping containers, ExxonMobil will verify if the HDPE bund/lining are sufficient to contain spills during transportation	x		Waste management plan, EIS Chapter 16
Waste	Transportation of restricted and non- restricted waste	•Soil, groundwater, surface water and marine water contamination. •Littering of the landscape from blown material •Creation of waste disposal legacy •Impact on community and worker health •Community disturbance / nuisance.	MM157	Palletise and securely tethered drums and totes before loading into container	x		Waste management plan, EIS Chapter 16
Waste	Transportation of restricted and non- restricted waste	•Soil, groundwater, surface water and marine water contamination. •Littering of the landscape from blown material •Creation of waste disposal legacy •Impact on community and worker health •Community disturbance / nuisance.	MM158	Use waste timber/wood or used tires to secure drums in position during movement to prevent palletised drums or pods from rubbing against each other or from the walls of the container	x		Waste management plan, EIS Chapter 16

Aspect	Cause of impact (activity/event)	Impact	MM ID	Management Measure	Project phase		Source
					Construction	Operation	
Waste	Transportation of restricted and non- restricted waste	•Soil, groundwater, surface water and marine water contamination. •Littering of the landscape from blown material •Creation of waste disposal legacy •Impact on community and worker health •Community disturbance / nuisance.	MM159	Equip vehicles used for transporting restricted liquid with adequate spill response kits, and persons transporting these wastes.	x		Waste management plan, EIS Chapter 16
Waste	Transportation of restricted and non- restricted waste	•Soil, groundwater, surface water and marine water contamination. •Littering of the landscape from blown material •Creation of waste disposal legacy •Impact on community and worker health •Community disturbance / nuisance.	MM160	Safely secure a safety data sheet in the waste container and provide the driver with a copy.	x		Waste management plan, EIS Chapter 16
Waste	Transportation of restricted and non- restricted waste	•Soil, groundwater, surface water and marine water contamination. •Littering of the landscape from blown material •Creation of waste disposal legacy •Impact on community and worker health •Community disturbance / nuisance.	MM161	Secure all waste containers designated for offsite transport and label the contents as per the safety data sheet.	x		Waste management plan, EIS Chapter 16
Waste	Transportation of restricted and non- restricted waste	•Soil, groundwater, surface water and marine water contamination. •Littering of the landscape from blown material •Creation of waste disposal legacy •Impact on community and worker health •Community disturbance / nuisance.	MM162	Inspect waste consignments prior to their leaving site to ensure waste containers are: •Labelled appropriately. •In good condition and not leaking. •Compatible with the waste it contains. •Appropriately sealed. •Not generating heat.	x		Waste management plan, EIS Chapter 16
Waste	Transportation of restricted and non- restricted waste	•Soil, groundwater, surface water and marine water contamination. •Littering of the landscape from blown material •Creation of waste disposal legacy •Impact on community and worker health •Community disturbance / nuisance.	MM163	Report any spills immediately to ExxonMobil.	x		Waste management plan, EIS Chapter 16
Waste	Transportation of restricted and non- restricted waste	•Soil, groundwater, surface water and marine water contamination. •Littering of the landscape from blown material •Creation of waste disposal legacy •Impact on community and worker health •Community disturbance / nuisance.	MM164	Keep a record of all waste, in accordance with ExxonMobil approved manifest and record keeping procedures. Waste manifest shall include, at a minimum, the following information: •Date and location of waste collection. •Description and classification of waste and its volume / weight (including type and number of containers). •Treatment, storage and/or disposal location.	x		Waste management plan, EIS Chapter 16
Waste	Disposal of non-restricted waste (landfill)	•Habitat degradation. •Soil, groundwater, surface water and marine water contamination. •Adverse impacts on worker and community health. •Degradation or destruction of natural seed bank. •Creation of a waste disposal legacy. •Attraction of feral / pest animals.	MM165	Prohibit burning waste in pits, piles or drums.	x		Waste management plan, EIS Chapter 16
Waste	Disposal of non-restricted waste (landfill)	•Habitat degradation. •Soil, groundwater, surface water and marine water contamination. •Adverse impacts on worker and community health. •Degradation or destruction of natural seed bank. •Creation of a waste disposal legacy. •Attraction of feral / pest animals.	MM166	Inspect third party offsite disposal facilities in accordance with the following criteria: •The facility has the technical capability to manage the waste in a manner that reduces immediate and future impact to the environment. •The facility has all required permits, certifications, and approvals, from applicable government authorities as per respective in-country regulations, Waigani Convention, Basal Convention, Stockholm Convention etc. •The waste service provider has been contracted through the use of an ExxonMobil service agreement. •The facility has been approved in advance by ExxonMobil.	x		Waste management plan, EIS Chapter 16
Waste	Disposal of non-restricted waste (landfill)	•Habitat degradation. •Soil, groundwater, surface water and marine water contamination. •Adverse impacts on worker and community health. •Degradation or destruction of natural seed bank. •Creation of a waste disposal legacy. •Attraction of feral / pest animals.	MM167	In the event transportation to an approved third party facility is not possible, the waste will be stored until the issue is resolved or after a new third party facility is audited and approved for use	x		Waste management plan, EIS Chapter 16
Waste	Disposal of non-restricted waste (landfill)	•Habitat degradation. •Soil, groundwater, surface water and marine water contamination. •Adverse impacts on worker and community health. •Degradation or destruction of natural seed bank. •Creation of a waste disposal legacy. •Attraction of feral / pest animals.	MM168	Develop and implement a tracking system to track waste quantities and types collected and disposed, collected location, disposed location and fate.	x		Waste management plan, EIS Chapter 16
Waste	Disposal of non-restricted waste (landfill)	•Habitat degradation. •Soil, groundwater, surface water and marine water contamination. •Adverse impacts on worker and community health. •Degradation or destruction of natural seed bank. •Creation of a waste disposal legacy. •Attraction of feral / pest animals.	MM169	Document the tracking waste handling and disposal activities to ensure the system is followed and waste is disposed of properly.	x		Waste management plan, EIS Chapter 16

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Aspect	Cause of impact (activity/event)	Impact	MM ID	Management Measure	Project phase		Source
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Waste	Disposal of non-restricted waste (landfill)	•Habitat degradation. •Soil, groundwater, surface water and marine water contamination. •Adverse impacts on worker and community health. •Degradation or destruction of natural seed bank. •Creation of a waste disposal legacy. •Attraction of feral / pest animals.	MM170	Use data from waste transfer forms and waste management facility weighbridges to produce reports that document conformance with the management plan.	x		Waste management plan, EIS Chapter 16
Waste	Disposal of non-restricted waste (landfill)	•Habitat degradation. •Soil, groundwater, surface water and marine water contamination. •Adverse impacts on worker and community health. •Degradation or destruction of natural seed bank. •Creation of a waste disposal legacy. •Attraction of feral / pest animals.	MM171	Develop and implement procedures for the management of the landfill sites which are in line with Good International Industry Practice.	x		Waste management plan, EIS Chapter 16
Waste	Disposal of non-restricted waste (landfill)	•Habitat degradation. •Soil, groundwater, surface water and marine water contamination. •Adverse impacts on worker and community health. •Degradation or destruction of natural seed bank. •Creation of a waste disposal legacy. •Attraction of feral / pest animals.	MM172	Prohibit disposal of wastes which are incompatible with the design of the landfill.	x		Waste management plan, EIS Chapter 16
Waste	Disposal of non-restricted waste (landfill)	•Habitat degradation. •Soil, groundwater, surface water and marine water contamination. •Adverse impacts on worker and community health. •Degradation or destruction of natural seed bank. •Creation of a waste disposal legacy. •Attraction of feral / pest animals.	MM173	Operate with a sufficient number of competent, trained operators.	x		Waste management plan, EIS Chapter 16
Waste	Export of restricted waste	Accidental releases from collection, segregation or storage activities.	MM174	Prevent co-mingling of, or contact between, incompatible wastes that allows for inspection between containers to monitor leaks or spills.	x		Waste management plan, EIS Chapter 16
Waste	Export of restricted waste	Accidental releases from collection, segregation or storage activities.	MM175	Store closed containers away from direct sunlight, wind and rain.	x		Waste management plan, EIS Chapter 16
Waste	Export of restricted waste	Accidental releases from collection, segregation or storage activities.	MM176	Use secondary containment systems constructed with materials appropriate for the wastes being contained and adequate to prevent loss to the environment	x		Waste management plan, EIS Chapter 16
Waste	Export of restricted waste	Accidental releases from collection, segregation or storage activities.	MM177	Use secondary containment whenever liquid wastes are stored in volumes greater than 220 L. The available volume of secondary containment must be at least 110% of the largest storage container or 25% of the total storage capacity (whichever is greater) in that specific location.	x		Waste management plan, EIS Chapter 16
Waste	Export of restricted waste	Accidental releases from collection, segregation or storage activities.	MM178	Provide adequate ventilation where volatile wastes are stored.	x		Waste management plan, EIS Chapter 16
Waste	Export of restricted waste	Accidental releases from collection, segregation or storage activities.	MM179	Train personnel in handling and storage of restricted waste.	x		Waste management plan, EIS Chapter 16
Waste	Export of restricted waste	Accidental releases from collection, segregation or storage activities.	MM180	Limit access to restricted waste storage areas to personnel who have received proper training	x		Waste management plan, EIS Chapter 16
Waste	Export of restricted waste	Accidental releases from collection, segregation or storage activities.	MM181	Prepare and implement spill response and emergency plans to manage accidental releases.	x		Waste management plan, EIS Chapter 16
Waste	Export of restricted waste	Accidental releases from collection, segregation or storage activities.	MM182	Develop and implement waste management procedures that include restricted waste storage processes.	x		Waste management plan, EIS Chapter 16
Waste	Export of restricted waste	Accidental releases from collection, segregation or storage activities.	MM183	Provide readily available information to employees on chemical compatibility.	x		Waste management plan, EIS Chapter 16
Waste	Disposal of food waste from accommodation areas, offices	•Waste disposal legacy •Soil, groundwater, and surface water.	MM184	Pre-treat food waste.	x		Waste management plan, EIS Chapter 16
Waste	Disposal of food waste from accommodation areas, offices	•Waste disposal legacy •Soil, groundwater, and surface water.	MM185	Install food waste dewatering systems in canteens / kitchens to reduce the volume of food wastes, where food waste is to be incinerated.	x		Waste management plan
Waste	Disposal of food waste from vessels	Marine water contamination.	MM186	Macerate food waste to particle size < 25mm and dispose in the sea.	x		Waste management plan
Greenhouse gas emissions	Combustion of diesel by plant and equipment	Scope 1 GHG emissions	MM187	Maintain vehicles and equipment to limit air emissions, and maximise fuel efficiency, and remove from service any vehicles or equipment from which emissions are excessive.	x		EIS Chapter 15
Greenhouse gas emissions	Solid waste incineration	Scope 1 GHG emissions	MM188	Minimise waste to minimise GHG emissions from treatment, disposal and/or transport of waste. Sort waste to minimise quantities landfilled and to maximise recycling and reuse as far as practicable.	x		EIS Chapter 15
Hazardous materials	Storage, handling and use of hazardous materials	Surface water, groundwater, marine and or soil contamination resulting in the degradation of the environment with subsequent potential impacts to biota and / or communities.	MM189	Procure hazardous materials from responsible and verified suppliers who comply with the Contractor Environmental requirements.	x		Hazardous materials management plan
Hazardous materials	Storage, handling and use of hazardous materials	Surface water, groundwater, marine and or soil contamination resulting in the degradation of the environment with subsequent potential impacts to biota and / or communities.	MM190	Procure the appropriate quantity of chemicals or hazardous material needed for the task.	x		Hazardous materials management plan
Hazardous materials	Storage, handling and use of hazardous materials	Surface water, groundwater, marine and or soil contamination resulting in the degradation of the environment with subsequent potential impacts to biota and / or communities.	MM191	Avoid the use of chemicals and hazardous materials subject to international bans or phase-outs due to their high toxicity to living organisms, environmental persistence, potential for bioaccumulation, or potential for deletion of the ozone layer. In all such cases, consider the use of less hazardous materials which are preferable from an environmental perspective.	x		Hazardous materials management plan
Hazardous materials	Storage, handling and use of hazardous materials	Surface water, groundwater, marine and or soil contamination resulting in the degradation of the environment with subsequent potential impacts to biota and / or communities.	MM192	Store, handle, apply and dispose of all hazardous materials in accordance with good industry practice.	x		Hazardous materials management plan

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Hazardous materials	Storage, handling and use of hazardous materials	Surface water, groundwater, marine and or soil contamination resulting in the degradation of the environment with subsequent potential impacts to biota and / or communities.	Refer to Invasive Species, Pathogens and Pests Management Plan.		x		Hazardous materials management plan
Hazardous materials	Storage, handling and use of hazardous materials	Surface water, groundwater, marine and or soil contamination resulting in the degradation of the environment with subsequent potential impacts to biota and / or communities.	Refer to MM118		x		Hazardous materials management plan
Hazardous materials	Storage, handling and use of hazardous materials	Surface water, groundwater, marine and or soil contamination resulting in the degradation of the environment with subsequent potential impacts to biota and / or communities.	MM193	Develop a spill prevention and response plan and train personnel in the implementation of procedures.	x		Hazardous materials management plan
Hazardous materials	Storage, handling and use of hazardous materials	Surface water, groundwater, marine and or soil contamination resulting in the degradation of the environment with subsequent potential impacts to biota and / or communities.	MM194	Undertake hazardous materials handling risk assessment for each chemical used on site, performed by competent persons trained to recognised international standards where applicable.	x		Hazardous materials management plan
Hazardous materials	Storage, handling and use of hazardous materials	Surface water, groundwater, marine and or soil contamination resulting in the degradation of the environment with subsequent potential impacts to biota and / or communities.	MM195	Create and maintain a Hazardous Materials Register that includes the following: •Name •Description (e.g., composition of the chemical). •Classification if applicable. •Characteristics that make the material hazardous (e.g., flammable, irritant). •Quantity of material held on site. •Quantity used per month.	x		Hazardous materials management plan
Hazardous materials	Storage, handling and use of hazardous materials	Surface water, groundwater, marine and or soil contamination resulting in the degradation of the environment with subsequent potential impacts to biota and / or communities.	MM196	Create and maintain a Material Safety Data Sheets (MSDS) log that is: •Available close to storage place and point of use. •Retained by the driver during transportation. •Retained in waterproof box adjacent to the area of storage. •At the site of offices and in emergency response rooms.	x		Hazardous materials management plan
Hazardous materials	Storage, handling and use of hazardous materials	Surface water, groundwater, marine and or soil contamination resulting in the degradation of the environment with subsequent potential impacts to biota and / or communities.	MM197	Locate hazardous materials storage systems above ground areas away from watercourses.	x		Hazardous materials management plan
Hazardous materials	Storage, handling and use of hazardous materials	Surface water, groundwater, marine and or soil contamination resulting in the degradation of the environment with subsequent potential impacts to biota and / or communities.	MM198	Test permanent storage vessels and enclosures intended for hazardous materials storage for leaks prior to installation and operation.	x		Hazardous materials management plan
Hazardous materials	Storage, handling and use of hazardous materials	Surface water, groundwater, marine and or soil contamination resulting in the degradation of the environment with subsequent potential impacts to biota and / or communities.	MM199	Identify radioactive materials to be utilised during construction and agree upon a procedure with ExxonMobil for the use, management, and disposal of such materials.	x		Hazardous materials management plan
Hazardous materials	Storage, handling and use of hazardous materials	Surface water, groundwater, marine and or soil contamination resulting in the degradation of the environment with subsequent potential impacts to biota and / or communities.	MM200	Incorporate overfill protection into primary storage tanks and transfer systems where appropriate such as: •Use of dripless hose connections where reasonably practicable. •Provision for overfill shutoff valves. •Inclusion of an overfill catch basin around the fill pipe to collect spills. •Use of piping connections with automatic overfill protection (float valve). •Provision of overfill or overpressure vents that allow controlled release to a capture point.	x		Hazardous materials management plan
Hazardous materials	Storage, handling and use of hazardous materials	Surface water, groundwater, marine and or soil contamination resulting in the degradation of the environment with subsequent potential impacts to biota and / or communities.	MM201	Test and treat drainage water from hazardous waste storage areas if necessary and as appropriate prior to discharge to the environment.	x		Hazardous materials management plan
Hazardous materials	Storage, handling and use of hazardous materials	Surface water, groundwater, marine and or soil contamination resulting in the degradation of the environment with subsequent potential impacts to biota and / or communities.	MM202	Prepare an explosives management plan compliant with the Explosives Act 1953,the Oil and Gas Regulations 2002, and ExxonMobil general specifications for explosives use that will consider: •Obtaining relevant licenses for explosive use. •Maintaining and managing an explosives inventory. •Engaging an appropriately qualified explosives handler. •Maintaining security guards at all explosives storage facilities. •Using explosive storage containers of sound construction (e.g., steel or reinforced concrete, at least two locks with different keys for each container). •Maintaining explosives logbook as needed.	x		Hazardous materials management plan
Hazardous materials	Storage, handling and use of hazardous materials	Surface water, groundwater, marine and or soil contamination resulting in the degradation of the environment with subsequent potential impacts to biota and / or communities.	MM203	Use dedicated fittings, pipes, and hoses specific to materials in tanks and develop and maintain procedures to prevent addition of hazardous materials to incorrect tanks.	x		Hazardous materials management plan
Hazardous materials	Storage, handling and use of hazardous materials	Surface water, groundwater, marine and or soil contamination resulting in the degradation of the environment with subsequent potential impacts to biota and / or communities.	MM204	Regularly inspect, maintain, and repair fittings, pipes and hoses.	x		Hazardous materials management plan
Hazardous materials	Storage, handling and use of hazardous materials	Surface water, groundwater, marine and or soil contamination resulting in the degradation of the environment with subsequent potential impacts to biota and / or communities.	MM205	Provide appropriate labelling of vehicles, vessels and packaging with the name or description of the hazardous material.	x		Hazardous materials management plan
Hazardous materials	Storage, handling and use of hazardous materials	Surface water, groundwater, marine and or soil contamination resulting in the degradation of the environment with subsequent potential impacts to biota and / or communities.	MM206	Select foundation system and treatments appropriately for structural integrity and fire resistance.	x		Hazardous materials management plan

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Hazardous materials	Storage, handling and use of hazardous materials	Surface water, groundwater, marine and or soil contamination resulting in the degradation of the environment with subsequent potential impacts to biota and / or communities.	MM207	Orient the design of infrastructure on site to increase the likelihood of vapour dissipation by wind.	x		Hazardous materials management plan
Hazardous materials	Storage, handling and use of hazardous materials	Surface water, groundwater, marine and or soil contamination resulting in the degradation of the environment with subsequent potential impacts to biota and / or communities.	MM208	Arrange equipment to limit potential fire escalation and equipment damages.	x		Hazardous materials management plan
Hazardous materials	Storage, handling and use of hazardous materials	Surface water, groundwater, marine and or soil contamination resulting in the degradation of the environment with subsequent potential impacts to biota and / or communities.	MM209	Build control room and camp sufficient distance from hydrocarbon area.	x		Hazardous materials management plan
Hazardous materials	Storage, handling and use of hazardous materials	Surface water, groundwater, marine and or soil contamination resulting in the degradation of the environment with subsequent potential impacts to biota and / or communities.	MM210	Design a passive fire protection system.	x		Hazardous materials management plan
Hazardous materials	Storage, handling and use of hazardous materials	Surface water, groundwater, marine and or soil contamination resulting in the degradation of the environment with subsequent potential impacts to biota and / or communities.	MM211	Design lightning protection for buildings and tower tops.	x		Hazardous materials management plan
Hazardous materials	Storage, handling and use of hazardous materials	Surface water, groundwater, marine and or soil contamination resulting in the degradation of the environment with subsequent potential impacts to biota and / or communities.	MM212	Install a pressure relief via mechanical flare system and safety instrumented system (i.e., high integrity pressure protection system).	x		Hazardous materials management plan
Hazardous materials	Storage, handling and use of hazardous materials	Surface water, groundwater, marine and or soil contamination resulting in the degradation of the environment with subsequent potential impacts to biota and / or communities.	MM213	Install automated control and shutdown system as required in the LNG Plant.	x		Hazardous materials management plan
Hazardous materials	Storage, handling and use of hazardous materials	Surface water, groundwater, marine and or soil contamination resulting in the degradation of the environment with subsequent potential impacts to biota and / or communities.	MM214	Implement a security plan with intrusion detection and closed-circuit television.	x		Hazardous materials management plan
Hazardous materials	Storage, handling and use of hazardous materials	Surface water, groundwater, marine and or soil contamination resulting in the degradation of the environment with subsequent potential impacts to biota and / or communities.	MM215	Install or upgrade security fences approximately 100 m from facilities for use of explosives.	x		Hazardous materials management plan
Hazardous materials	Storage, handling and use of hazardous materials	Surface water, groundwater, marine and or soil contamination resulting in the degradation of the environment with subsequent potential impacts to biota and / or communities.	MM216	Clear vegetation around LNG Plant along fence line.	x		Hazardous materials management plan
Hazardous materials	Storage, handling and use of hazardous materials	Surface water, groundwater, marine and or soil contamination resulting in the degradation of the environment with subsequent potential impacts to biota and / or communities.	Refer to MM105		x		Hazardous materials management plan
Hazardous materials	Transportation of hazardous materials	Surface water, groundwater, marine and or soil contamination resulting in the degradation of the environment with subsequent potential impacts to biota and / or communities.	Refer to MM31		x		Hazardous materials management plan
Hazardous materials	Transportation of hazardous materials	Surface water, groundwater, marine and or soil contamination resulting in the degradation of the environment with subsequent potential impacts to biota and / or communities.	MM217	Adhere to ExxonMobil's safe driving requirements, tanker loading and unloading requirements.	x		Hazardous materials management plan
Hazardous materials	Transportation of hazardous materials	Surface water, groundwater, marine and or soil contamination resulting in the degradation of the environment with subsequent potential impacts to biota and / or communities.	MM218	Use containers for storage or transportation of chemicals and hazardous materials shall that are compatible with the material being transported and are in good physical condition (no severe rusting or structural defects).	x		Hazardous materials management plan
Hazardous materials	Transportation of hazardous materials	Surface water, groundwater, marine and or soil contamination resulting in the degradation of the environment with subsequent potential impacts to biota and / or communities.	MM219	Avoid the transportation of hazardous materials through villages and towns by using alternative routes, where possible.	x		Hazardous materials management plan
Hazardous materials	Transportation of hazardous materials	Surface water, groundwater, marine and or soil contamination resulting in the degradation of the environment with subsequent potential impacts to biota and / or communities.	MM220	Maintain and inspect bulk fuel transport vehicles.	x		Hazardous materials management plan
Hazardous materials	Transportation of hazardous materials	Surface water, groundwater, marine and or soil contamination resulting in the degradation of the environment with subsequent potential impacts to biota and / or communities.	MM221	Provide appropriate labelling of vehicles, vessels and packaging with the name or description of the hazardous material.	x		Hazardous materials management plan
Hazardous materials	Transportation of hazardous materials	Surface water, groundwater, marine and or soil contamination resulting in the degradation of the environment with subsequent potential impacts to biota and / or communities.	Refer to MM193		x		Hazardous materials management plan
Hazardous materials	Fire response training or equipment testing.	Surface water, groundwater, marine and or soil contamination resulting in the degradation of the environment with subsequent potential impacts to biota and / or communities.	MM222	Establish appropriate drainage water collection and treatment networks.	x		Hazardous materials management plan

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Hazardous materials	Fire response training or equipment testing.	Surface water, groundwater, marine and or soil contamination resulting in the degradation of the environment with subsequent potential impacts to biota and / or communities.	MM223	Install active firewater/deluge protection.	x		Hazardous materials management plan
Hazardous materials	Fire response training or equipment testing.	Surface water, groundwater, marine and or soil contamination resulting in the degradation of the environment with subsequent potential impacts to biota and / or communities.	MM224	Consider installing interceptor pits or similar to collect contaminated surface water runoff.	x		Hazardous materials management plan
Hazardous materials	Fuel handling, vehicles, machinery and washdown.	Surface water, groundwater, marine and or soil contamination resulting in the degradation of environmental and/or health outcomes	MM225	Install or upgrade bund or curbing around storage areas to contain spills.	x		Hazardous materials management plan
Hazardous materials	Fuel handling, vehicles, machinery and washdown.	Surface water, groundwater, marine and or soil contamination resulting in the degradation of environmental and/or health outcomes	MM226	Install or upgrade fencing and security to prevent third-party tampering.	x		Hazardous materials management plan
Hazardous materials	Fuel handling, vehicles, machinery and washdown.	Surface water, groundwater, marine and or soil contamination resulting in the degradation of environmental and/or health outcomes	Refer to Spill Prevention and Response Management Plan and train staff in their responsibilities under the plan.		x		Hazardous materials management plan
Hazardous materials	Fuel handling, vehicles, machinery and washdown.	Surface water, groundwater, marine and or soil contamination resulting in the degradation of environmental and/or health outcomes	Refer to MM18		x		Hazardous materials management plan
Hazardous materials	Fuel handling, vehicles, machinery and washdown.	Surface water, groundwater, marine and or soil contamination resulting in the degradation of environmental and/or health outcomes	Refer to MM31		x		Hazardous materials management plan
Hazardous materials	Fuel handling, vehicles, machinery and washdown.	Surface water, groundwater, marine and or soil contamination resulting in the degradation of environmental and/or health outcomes	MM227	Implement ExxonMobil's safe driving requirements, tanker loading and unloading requirements.	x		Hazardous materials management plan
Raw materials	Development of new or expansion of existing quarries or borrow pits or aggregate	•Reduction in population numbers and viability of native plants and animals, included species listed under Papua New Guinea legislation and international agreements. •Altered hydrological regimes to wetlands through increased or diminished flows and accumulation of nutrients/contaminants. •Exploitative working conditions. •Disturbance of important environmentally sensitive receptors.	MM228	Identify boundaries of areas to be disturbed at each quarry Project site prior to works commencing.	x		Hazardous materials management plan
Raw materials	Development of new or expansion of existing quarries or borrow pits or aggregate	•Reduction in population numbers and viability of native plants and animals, included species listed under Papua New Guinea legislation and international agreements. •Altered hydrological regimes to wetlands through increased or diminished flows and accumulation of nutrients/contaminants. •Exploitative working conditions. •Disturbance of important environmentally sensitive receptors.	MM229	Avoid or reduce potential impacts to the workforce or local community or damage to neighbouring environmental resources or receptors when opening work site.	x		Hazardous materials management plan
Raw materials	Development of new or expansion of existing quarries or borrow pits or aggregate	•Reduction in population numbers and viability of native plants and animals, included species listed under Papua New Guinea legislation and international agreements. •Altered hydrological regimes to wetlands through increased or diminished flows and accumulation of nutrients/contaminants. •Exploitative working conditions. •Disturbance of important environmentally sensitive receptors.	MM230	Develop a reinstalment/closure plan prior to opening a new site which includes: •Achieving stable and safe faces and benches. •On extraction activities ceasing, sites are to be made safe •Discourage further unregulated activities by closing access roads. •Promote natural revegetation by ripping base of the quarry. •Communicate with the community to inform closure	x		Hazardous materials management plan
Raw materials	Development of new or expansion of existing quarries or borrow pits or aggregate	•Reduction in population numbers and viability of native plants and animals, included species listed under Papua New Guinea legislation and international agreements. •Altered hydrological regimes to wetlands through increased or diminished flows and accumulation of nutrients/contaminants. •Exploitative working conditions. •Disturbance of important environmentally sensitive receptors.	MM231	Prohibited blasting within 100 m of known mating or nesting sites where noise sensitive protected species have been identified.	x		Hazardous materials management plan

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					Construction	Operation	
Raw materials	Development of new or expansion of existing quarries or borrow pits or aggregate	•Reduction in population numbers and viability of native plants and animals, included species listed under Papua New Guinea legislation and international agreements. •Altered hydrological regimes to wetlands through increased or diminished flows and accumulation of nutrients/contaminants. •Exploitative working conditions. •Disturbance of important environmentally sensitive receptors.	MM232	Reduce ecological receptor impacts by adopting the following measures: •Vegetation clearance to be limited to the minimum necessary to accommodate construction within the Project footprint area. •Restrict extent of disturbance with the Project site to the extent practicable. •Establishing temporary construction and laydown sites in areas of low herpetofauna, avifauna and mammalian sensitivities. •Stockpiles are to be protected from erosion by stormwater. •Stockpiled soils are not to be compacted. •Erosion and sedimentation controls (such as temporary drainage systems) will be implemented. •Dust suppression to be implemented. •Backfill where practicable, borrow pits with appropriate and compactible material. Allowances will be made for natural settlement/subsidence. •Borrow pits to be treated as temporary use areas and will be revegetated/rehabilitated as soon as practicable after sections of work are complete. •Landscaping and rehabilitation should be restricted to the use of indigenous species and species known to be non-invasive in tropical climates. •Control alien/invasive plant species within the area under the Projects control by implementing a monitoring program. A qualified botanist to be contracted to oversee regular site surveys for non-native flora species as part of the program.	x		Hazardous materials management plan
Raw materials	Development of new or expansion of existing quarries or borrow pits or aggregate	•Reduction in population numbers and viability of native plants and animals, included species listed under Papua New Guinea legislation and international agreements. •Altered hydrological regimes to wetlands through increased or diminished flows and accumulation of nutrients/contaminants. •Exploitative working conditions. •Disturbance of important environmentally sensitive receptors.	MM233	Avoid the establishment of quarries /borrow pits within areas which contain ecologically or culturally sensitive areas.	x		Hazardous materials management plan
Raw materials	Development of new or expansion of existing quarries or borrow pits or aggregate	•Reduction in population numbers and viability of native plants and animals, included species listed under Papua New Guinea legislation and international agreements. •Altered hydrological regimes to wetlands through increased or diminished flows and accumulation of nutrients/contaminants. •Exploitative working conditions. •Disturbance of important environmentally sensitive receptors.	MM234	Establish adequate buffer areas where quarries and borrow pits are adjacent to sensitive areas where reasonably practicable.	x		Hazardous materials management plan
Raw materials	Development of new or expansion of existing quarries or borrow pits or aggregate	•Reduction in population numbers and viability of native plants and animals, included species listed under Papua New Guinea legislation and international agreements. •Altered hydrological regimes to wetlands through increased or diminished flows and accumulation of nutrients/contaminants. •Exploitative working conditions. •Disturbance of important environmentally sensitive receptors.	MM235	Minimise project footprint and associated raw material used as far as practicable by accurately estimating the land required for different project facilities and infrastructure and optimizing site configuration.	x		Hazardous materials management plan
Raw materials	Development of new or expansion of existing quarries or borrow pits or aggregate	•Reduction in population numbers and viability of native plants and animals, included species listed under Papua New Guinea legislation and international agreements. •Altered hydrological regimes to wetlands through increased or diminished flows and accumulation of nutrients/contaminants. •Exploitative working conditions. •Disturbance of important environmentally sensitive receptors.	MM236	Use borrow pits and quarries that are close or adjacent to existing and planned facilities and infrastructure to minimise access requirements.	x		Hazardous materials management plan
Raw materials	Development of new or expansion of existing quarries or borrow pits or aggregate	•Reduction in population numbers and viability of native plants and animals, included species listed under Papua New Guinea legislation and international agreements. •Altered hydrological regimes to wetlands through increased or diminished flows and accumulation of nutrients/contaminants. •Exploitative working conditions. •Disturbance of important environmentally sensitive receptors.	MM237	Construct quarries and borrow pits within disturbed areas over non-disturbed areas.	x		Hazardous materials management plan
Raw materials	Development of new or expansion of existing quarries or borrow pits or aggregate	•Reduction in population numbers and viability of native plants and animals, included species listed under Papua New Guinea legislation and international agreements. •Altered hydrological regimes to wetlands through increased or diminished flows and accumulation of nutrients/contaminants. •Exploitative working conditions. •Disturbance of important environmentally sensitive receptors.	MM238	Assess aggregate requirements (quality and quantity) prior to construction of quarries or borrow pits.	x		Hazardous materials management plan
Raw materials	Imported aggregate or fill material.	Contamination of soil	MM239	Ensure imported fill material is inert and free from any contamination by undertaking periodic due diligence checks at the supplier's source and when the material is delivered to the site. Fill suspected of being contaminated is to be identified and quarantined and the Company should be notified immediately.	x		Hazardous materials management plan
Raw materials	Imported aggregate or fill material.	Contamination of soil	MM240	Do not use contaminated fill material.	x		Hazardous materials management plan

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					Construction	Operation	
Raw materials	Imported aggregate or fill material.	Contamination of soil	MM241	Return contaminated fill material to unless further testing indicates that the soil is inert.	x		Hazardous materials management plan
Raw materials	Timber supply management	•Reduction in population numbers and viability of native plants and animals, included species listed under Papua New Guinea legislation and international agreements. •Increased soil erosion and sedimentation along surface water flow lines.	MM242	Use materials generated from construction activities to reduce volume of material extracted and imported from quarries and borrow pits.	x		Hazardous materials management plan
Raw materials	Timber supply management	•Reduction in population numbers and viability of native plants and animals, included species listed under Papua New Guinea legislation and international agreements. •Increased soil erosion and sedimentation along surface water flow lines.	MM243	Natural materials for construction (sand gravels, pebbles, cobbles, and boulders) are not to be extracted from riverbeds or floodplains areas.	x		Hazardous materials management plan
Raw materials	Timber supply management	•Reduction in population numbers and viability of native plants and animals, included species listed under Papua New Guinea legislation and international agreements. •Increased soil erosion and sedimentation along surface water flow lines.	MM244	Acquire in-country timber from legal Company approved sources.	x		Hazardous materials management plan
Raw materials	Timber supply management	•Reduction in population numbers and viability of native plants and animals, included species listed under Papua New Guinea legislation and international agreements. •Increased soil erosion and sedimentation along surface water flow lines.	Refer to MM235		x		Hazardous materials management plan
Raw materials	Timber supply management	•Reduction in population numbers and viability of native plants and animals, included species listed under Papua New Guinea legislation and international agreements. •Increased soil erosion and sedimentation along surface water flow lines.	MM245	Use sites close or adjacent to existing and planned facilities and infrastructure to minimise access requirements.	x		Hazardous materials management plan
Acid sulphate soils	Bored or drilled pile excavations	•Excavated acid sulphate soils may be placed in aerobic conditions and any untreated acid sulphate soils may leach sulphuric acid and dissolved metals into the environment. •Exposure of soils, surface water and groundwater to acid sulphate soils and acidic leachate resulting in a reduction in water quality.	MM246	Pre-disturbance surveys Undertake pre-disturbance site specific soil surveys to identify the potential the presence of acid sulphate soils and the treatment required if the areas were disturbed during construction. After the completion of these surveys implement the management measures where practicable.	x		Acid Sulphate Soils Management Plan
Acid sulphate soils	Stripping and excavation for roads, pipelines, structures and civil works	•Excavated acid sulphate soils may be placed in aerobic conditions and untreated acid sulphate soils may leach sulfuric acid and dissolved metals into the environment. •Change to surface runoff patterns may speed the release and transportation acidic leachate containing dissolved metals to the environment. •Exposure of soils, surface water and groundwater to acid sulphate soils and acid leachate resulting in a reduction in water quality. •Acid corrosion on facility infrastructure resulting from direct contact with acid sulphate soils.	Refer to MM246		x		Acid Sulphate Soils Management Plan
Acid sulphate soils	Stockpiling of acid sulphate Soils	Uncontrolled surface runoff from acid sulphate soils stockpiles may leach any untreated acid and dissolved metals.	MM247	Minimisation •Conduct excavation in stages to minimise the amount of time the acid sulphate soils are exposed to high levels of oxygen. •Segregate any exposed acid sulphate soils within a bunded area with an acid-resistant liner, preventing the release of high acidity runoff.	x		Acid Sulphate Soils Management Plan
Acid sulphate soils	Fill Placement	•Placement of fill over weak alluvial soils may result in settlement of land adjacent to the loading area. Settlement may cause acid sulphate soils to come into contact with groundwater. •Heaving may result in potential acid sulphate soils being elevated to an aerobic situation causing the formation and leaching of sulphuric acid.	MM248	Avoidance: Untreated acid sulphate soils will not be used as fill material for the Project.	x		Acid Sulphate Soils Management Plan
Acid sulphate soils	Re-use of acid sulphate soils for vegetation strata (topsoil)	Reuse of any untreated acid sulphate soils can lower soil pH and may severely limit vegetation growth in such areas and result in the leaching of acids and dissolved metals.	MM249	Avoidance: •Untreated acid sulphate soils will not be used as topsoil during rehabilitation. •Place acid sulphate soil stockpiles away from topsoil stockpiles and will be labelled. •Stockpile acid sulphate soils on acid proof liners and contain in a bunded area to prevent leachate reaching sensitive receptors.	x		Acid Sulphate Soils Management Plan
Cultural heritage	On-ground works and movement of people and vehicles Increase in person and vehicle traffic outside the direct disturbance areas	Disturbance or damage to cultural heritage sites causing loss of cultural value or historical and scientific information about Papua New Guineas past and potential damage to local and national cultural identity (including loss of sites from oral tradition)	MM250	All requirements of the PNG LNG Project CHMP will be implemented with regard to cultural heritage sites situated within the Project impact footprint within the perimeter security fence.	x		Cultural heritage management plan, EIS Chapter 13
Cultural heritage	On-ground works and movement of people and vehicles Increase in person and vehicle traffic outside the direct disturbance areas	Disturbance or damage to cultural heritage sites causing loss of cultural value or historical and scientific information about Papua New Guineas past and potential damage to local and national cultural identity (including loss of sites from oral tradition)	MM251	Develop and implement a cultural awareness program for all employees and contractors.	x		Cultural heritage management plan, EIS Chapter 13
Cultural heritage	On-ground works and movement of people and vehicles Increase in person and vehicle traffic outside the direct disturbance areas	Disturbance or damage to cultural heritage sites causing loss of cultural value or historical and scientific information about Papua New Guineas past and potential damage to local and national cultural identity (including loss of sites from oral tradition)	MM252	Specify salvage activities (whether it be surface artefact collections or subsurface archaeological excavations) where required, including but not limited to: •Development of an appropriate salvage methodology to be implemented prior to ground disturbing Project activities commencing. •Establishing specific measures for the exhumation of any human remains that may be unearthed as chance finds or during cultural heritage salvage investigations.	x		Cultural heritage management plan, EIS Chapter 13

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Aspect	Cause of impact (activity/event)	Impact	MM ID	Management Measure	Project phase		Source
					Construction	Operation	
Cultural heritage	On-ground works and movement of people and vehicles Increase in person and vehicle traffic outside the direct disturbance areas	Disturbance or damage to cultural heritage sites causing loss of cultural value or historical and scientific information about Papua New Guineas past and potential damage to local and national cultural identity (including loss of sites from oral tradition)	MM253	Require the implementation of the PNG LNG Project CHMP Chance Finds Protocol with clear processes for reporting, investigation and management of cultural heritage chance finds discovered during Project related activities.	x		Cultural heritage management plan, EIS Chapter 13
Cultural heritage	On-ground works and movement of people and vehicles Increase in person and vehicle traffic outside the direct disturbance areas	Disturbance or damage to cultural heritage sites causing loss of cultural value or historical and scientific information about Papua New Guineas past and potential damage to local and national cultural identity (including loss of sites from oral tradition)	MM254	Maintain a cultural heritage site database and update the database as new information becomes available. The database will inform further planning and design and will assist in the implementation of recommended management measures. It will include the precise locations of all sites, particularly those to be avoided.	x		Cultural heritage management plan, EIS Chapter 13
Cultural heritage	On-ground works and movement of people and vehicles Increase in person and vehicle traffic outside the direct disturbance areas	Disturbance or damage to cultural heritage sites causing loss of cultural value or historical and scientific information about Papua New Guineas past and potential damage to local and national cultural identity (including loss of sites from oral tradition)	MM255	Require engagement with men and women in local communities regarding the: •Content of the project-specific Cultural Heritage Management Plan, including the community engagement methods that will be employed in recognition of community values •Development of culturally appropriate methods for the practical management of cultural heritage sites that are to be protected from impacts •Development of appropriate management measures in relation to their oral tradition sites. Culturally appropriate responses to the management of sites and places that would be unavoidably impacted by Project-related activities may include avoidance, exhumation/relocation of the site and traditional ceremonies (that should precede the commencement of Project-related activities)	x		Cultural heritage management plan, EIS Chapter 13
Cultural heritage - site specific	On-ground works and movement of people and vehicles Increase in person and vehicle traffic outside the direct disturbance areas	Disturbance or damage to cultural heritage sites causing loss of cultural value or historical and scientific information about Papua New Guineas past and potential damage to local and national cultural identity (including loss of sites from oral tradition)	MM256	Collection of surface artefacts by an archaeologist prior to construction for the following sites: •AK Road 1 •AK Road 2 •DS006 •DS048 •DS070 •DS071 •DS081	x		Cultural heritage management plan, EIS Chapter 13
Cultural heritage - site specific	On-ground works and movement of people and vehicles Increase in person and vehicle traffic outside the direct disturbance areas	Disturbance or damage to cultural heritage sites causing loss of cultural value or historical and scientific information about Papua New Guineas past and potential damage to local and national cultural identity (including loss of sites from oral tradition)	MM257	Site DS021: •Avoid •Confirm the site's location and boundary by an archaeologist •Erect a suitable barrier or other measures such as cultural awareness training to prevent access by Project employees and contractors prior to works commencing •Include reference to this site protection strategy in daily toolbox meetings.	x		Cultural heritage management plan, EIS Chapter 13
Cultural heritage - site specific	On-ground works and movement of people and vehicles Increase in person and vehicle traffic outside the direct disturbance areas	Disturbance or damage to cultural heritage sites causing loss of cultural value or historical and scientific information about Papua New Guineas past and potential damage to local and national cultural identity (including loss of sites from oral tradition)	MM258	Undertake salvage excavation of sites NA/AK 8.2 and NA/AK 8.3 consistent with the salvage method: •Salvage works that are recommended prior to the commencement of construction-related activities within the laydown study zone must be agreed by NMAG for high significant sites. •Representatives of local village communities should be engaged to assist the salvage program. •Salvage excavation at a cultural heritage site must be supervised by a suitably qualified archaeologist and conducted in a manner consistent with good industry practice. •Salvage excavation should commence with a 1 m ² (i.e., a 1 m x 1 m) salvage pit. Excavation should continue to a culturally sterile depth or to the maximum depth of construction impacts at that location. This will be agreed and determined onsite by the archaeologist and ExxonMobil in consultation with the affected community representative(s). •Where an archaeological deposit uncovered or partially uncovered in the 1 m ² salvage pit is determined to be of high significance due to content, condition and representativeness, the salvage excavation may be extended as agreed with Papua LNG co-venture participants and the NMAG. •It may be necessary to determine the site extent. In this case, a site boundary establishment program shall be proposed by the archaeologist and undertaken subject to the agreement of the Papua LNG co-venture participants and the NMAG. •Following the determination of site extent, if harm avoidance is achievable, no further salvage excavation is required. •Guidance on custodianship of recovered materials will be determined by the NMAG.	x		Cultural heritage management plan, EIS Chapter 13
Social	Project induced in-migration	•Increased incidence of sanitation-related diseases •Reduced capacity of terrestrial resources to support livelihoods in LNG Plant communities due to population growth •The Project may affect the ability of LNG Plant communities to access and sustain an attachment to land due to in migration. •An increase in crime and public disorder •Increased incidence of tuberculosis and respiratory diseases	MM259	Develop PIIM indicators for monitoring and reporting across the Project's construction and where appropriate operation.	x		Project Induced In-migration Management Plan, EIS Chapter 13

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Aspect	Cause of impact (activity/event)	Impact	MM ID	Management Measure	Project phase		Source
					Construction	Operation	
Social	Project induced in-migration	•Increased incidence of sanitation-related diseases •Reduced capacity of terrestrial resources to support livelihoods in LNG Plant communities due to population growth •The Project may affect the ability of LNG Plant communities to access and sustain an attachment to land due to in migration. •An increase in crime and public disorder •Increased incidence of tuberculosis and respiratory diseases •Reduced capacity of health and education services due to an increase in population.	MM260	Minimising the incentive for in-migration through developing and communicating clear practices for recruitment, contracting, camp management and workforce accommodation, site access, and transport and logistics.	x		Project Induced In-migration Management Plan, EIS Chapter 13
Social	Project induced in-migration	•Increased incidence of sanitation-related diseases •Reduced capacity of terrestrial resources to support livelihoods in LNG Plant communities due to population growth •The Project may affect the ability of LNG Plant communities to access and sustain an attachment to land due to in migration. •An increase in crime and public disorder •Increased incidence of tuberculosis and respiratory diseases.	MM261	ExxonMobil will work with key stakeholders and LNG Plant communities to identify community infrastructure and resources that may need additional support in each specific community due to the effects of PIIM. This may incorporate a range of actions as agreed with LNG Plant communities, including but not limited to the development of strategic plans to provide for adequate access to and maintenance of community services, infrastructure and resources, including but not limited to housing, water and sanitation, education and health care.	x		Project Induced In-migration Management Plan, EIS Chapter 13
Social	Project induced in-migration	•Increased incidence of sanitation-related diseases •Reduced capacity of terrestrial resources to support livelihoods in LNG Plant communities due to population growth •The Project may affect the ability of LNG Plant communities to access and sustain an attachment to land due to in migration. •An increase in crime and public disorder •Increased incidence of tuberculosis and respiratory diseases •Reduced capacity of health and education services due to an increase in population.	MM262	ExxonMobil will work with key stakeholders and LNG Plant communities to: o Identify potential PIIM and work with key stakeholders (government and LNG Plant community leaders) and Project functions to create systems to deter PIIM to Promote multi-stakeholders involvement and management of PIIM impacts and opportunities	x		Project Induced In-migration Management Plan, EIS Chapter 13
Social	Employment	A peak anticipated workforce of between 5,000 and 7,000 during the construction phase—potential to generate employment expectations which could act as incentives to migrate to LNG Plant communities.	MM263	Contractors will be required to develop and implement a recruitment plan, which will include monitoring the point of origin of all employees based on the geographic priority areas.	x		Project Induced In-migration Management Plan
Social	Employment	A peak anticipated workforce of between 5,000 and 7,000 during the construction phase—potential to generate employment expectations which could act as incentives to migrate to LNG Plant communities.	MM264	Establish specific recruitment points for Papua New Guinean workers at local and national levels, with no recruitment undertaken at the Project site or any contractor-led activities.	x		Project Induced In-migration Management Plan
Social	Employment	A peak anticipated workforce of between 5,000 and 7,000 during the construction phase—potential to generate employment expectations which could act as incentives to migrate to LNG Plant communities.	MM265	Establish an electronic job application process on the Project website for semi-skilled and skilled positions.	x		Project Induced In-migration Management Plan
Social	Employment	A peak anticipated workforce of between 5,000 and 7,000 during the construction phase—potential to generate employment expectations which could act as incentives to migrate to LNG Plant communities.	MM266	Communicate the recruitment priority criteria and eligibility criteria for each area of recruitment prioritisation widely and within areas likely to generate PIIM. These areas may include the communities adjacent to the Project areas in Hiri District, the wider Central Province, the NCD areas. ExxonMobil will monitor in-migration during the construction period and identify other areas to be included in project communications. ExxonMobil will inform contractors of these areas as the arise and the contractor will include these areas in their recruitment communications, as agreed with ExxonMobil.	x		Project Induced In-migration Management Plan
Social	Procurement	Potential for unsolicited or informal suppliers setting up businesses in proximity to the Project. .	MM267	With the exception of landowner companies, no selection preference will be awarded to Papua New Guinean contractors bidding for contracts in Hiri District and LNG Plant communities, compared to those in other parts of Papua New Guinea. ExxonMobil-required goods and services will only be procured through formal contracts via approved suppliers (i.e., no informal purchasing arrangements will be entered into at Project sites). ExxonMobil will continue to communicate this to communities and more broadly, as required.	x		Project Induced In-migration Management Plan
Social	Employment Project induced in-migration	Large workforce camps can attract PIIM.	PIIM incentives potentially induced by Project's construction camps and Project's workforce living in camp accommodations will be managed through the Camp Management Plan.		x		Project Induced In-migration Management Plan
Social	Project induced in-migration	Opportunistic in-migration and re-development of cleared areas if cleared land is not secured.	MM268	Restrict access to the site to Project personnel only and control through fences with appropriate security access measures and procedures.	x		Project Induced In-migration Management Plan
Social	Project induced in-migration	PIIM may impact on a range of community attributes and values, including community infrastructure and resources, housing, water and sanitation, education and health care.	MM269	Restrict access to the site to Project personnel only and control through fences with appropriate security access measures and procedures.	x		Project Induced In-migration Management Plan
Social	Project induced in-migration	PIIM may impact on a range of community attributes and values, including community infrastructure and resources, housing, water and sanitation, education and health care.	MM270	Engage with the ward, district and provincial governments to understand existing development planning processes. Through working with the relevant government stakeholders, ExxonMobil will seek to align PIIM measures with existing and emerging government plans and planning processes.	x		Project Induced In-migration Management Plan
Social	Project induced in-migration	PIIM may impact on a range of community attributes and values, including community infrastructure and resources, housing, water and sanitation, education and health care.	MM271	Engage with village and ward leaders in all LNG Plant communities to discuss PIIM, how to deter/minimise it, and how to manage it if/when it occurs.	x		Project Induced In-migration Management Plan

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					Construction	Operation	
Social	Project induced in-migration	PIIM may impact on a range of community attributes and values, including community infrastructure and resources, housing, water and sanitation, education and health care.		Improving access to and maintenance of community services, infrastructure and resources, including but not limited to housing, water and sanitation, education and health care to meet the additional demands of population increase will be managed through the Community Development Support Plan.	x		Project Induced In-migration Management Plan
Social	Project induced in-migration	Managing Specific PIIM-Related Impacts		Adverse impacts on community health, safety, and security will be managed through the Community Health, Safety and Security Management Plan.	x		Project Induced In-migration Management Plan
Social	Project induced in-migration	Managing Specific PIIM-Related Impacts		Adverse impacts on community social structures, livelihoods and traditions will be managed through the Community Development Support Plan.	x		Project Induced In-migration Management Plan
Social	Project induced in-migration	Managing Specific PIIM-Related Impacts		Adverse impacts on communities generated from Project's workforce will be managed through the Workforce Relations and Working Conditions Management Plan.	x		Project Induced In-migration Management Plan
Social	Project induced in-migration	Managing Specific PIIM-Related Impacts		Adverse impacts on communities generated from Project's workforce residing in the camps will be managed through the Camp Management Plan.	x		Project Induced In-migration Management Plan
Social	Project induced in-migration	Effective engagement with stakeholders has the potential to deliver improved PIIM management outcomes	MM272	Establish a multi-stakeholder forum.	x		Project Induced In-migration Management Plan
Social	Project induced in-migration	Effective engagement with stakeholders has the potential to deliver improved PIIM management outcomes	Refer to MM262		x		Project Induced In-migration Management Plan
Social	Employment Project benefit streams	Detrimental changes in rates of non-communicable diseases due to increased consumption of processed foods.	MM273	ExxonMobil will investigate partnering with relevant organisations where available and appropriate to develop and implement information, education and communication programs and nutritional programs among Project workers to promote proper nutrition practices.	x		Community health, safety and security management plan, EIS Chapter 13
Social	Employment Project benefit streams	•Reduced perception of safety •Increase in crime and public disorder •Increase in 'anti-social' behaviour.	MM274	Support and, where appropriate, build the capacity of civil or third-party institutions in the LNG Plant communities to support village justice systems, police, traditional leadership, and authority structures to respond to anti-social behaviours.	x		Community health, safety and security management plan
Social	Employment Project benefit streams	•Reduced perception of safety •Increase in crime and public disorder •Increase in 'anti-social' behaviour.	MM275	ExxonMobil will partner with relevant organisations where available and appropriate (e.g., donors, civil society and NGOs) to raise community awareness regarding alcohol and other drugs use and management.	x		Community health, safety and security management plan, EIS Chapter 13
Social	Employment Project benefit streams	Increase in family and sexual violence.	MM276	ExxonMobil will partner with relevant organisations where available and appropriate (e.g., donors, civil society and NGOs) to deliver family and sexual violence awareness programs within LNG Plant communities.	x		Community health, safety and security management plan
Social	Employment Project benefit streams	Increase in family and sexual violence.	MM277	ExxonMobil will continue to support the operational workforce to access family and sexual violence support services.	x		EIS Chapter 13
Social	Employment Project benefit streams	Increase in family and sexual violence.	MM278	The ExxonMobil Community Grievance Mechanism will maintain gender-responsive features, such as: •Including gender diversity in grievance mechanism staff and providing staff with gender sensitivity training. •Involving local women's groups as potential points of contact for anonymous reporting and ongoing support for complainants. •Providing for independent, gender-sensitive investigations where there are serious allegations of gender-based violence by ExxonMobil or contractor personnel.	x		Community health, safety and security management plan, EIS Chapter 13
Social	Employment Project benefit streams	Increase in family and sexual violence.	MM279	ExxonMobil will develop an effective interface with LNG Plant communities, village leaders and district authorities to report any increases in high-risk sexual behaviour from employees and any development of commercial sex work in communities linked to the Project workforce.	x		Community health, safety and security management plan, EIS Chapter 13
Social	Project construction and operation activities	Decrease in community marine safety	MM280	Develop a Marine Operations for the construction phase in liaison with the relevant maritime authorities, taking into account all requirements and guidelines of the government, international conventions, industry good practices and community's expectations. The Plan will include at a minimum: •Vessel limits •The schedule of vessel movements •Navigation restrictions •Suitable aids (e.g., buoys and lights) to minimise interference with other vessels •Emergency response •Training and qualification requirements of crew •Monitoring and reporting requirements.	x		Community health, safety and security management plan
Social	Project construction and operation activities	Decrease in community marine safety	MM281	Inform LNG Plant communities of activities, including exclusion zones.	x		Community health, safety and security management plan
Social	Employment Project benefit streams	An increase in sexually transmissible infections	MM282	Develop and implement a Project Communicable Disease Strategy prior to construction. The program will include but not be limited to: •Educate workers on the identification and treatment of curable sexually transmitted infections, including providing condoms and femidoms to workers. •Maintain voluntary counselling, testing and referral for testing for HIV consistent with local laws. •Partner with relevant organisations where available and appropriate (e.g., donors, civil society and NGOs) to deliver a community health education campaign, including but not limited to sexually transmitted infection prevention, identification, and management.	x		Community health, safety and security management plan
Social	Employment Project benefit streams	Reduced personal security due to the use of excessive force by the RPNGC or the Project's security personnel.	MM283	ExxonMobil has signed a Memorandum of Understanding (MOU) with the RPNGC, which sets out the interface with the RPNGC in relation to security for the Project, which sets out the interface with the RPNGC in relation to security for the Project. The MOU plays an important role in establishing clear expectations as well as providing a solid foundation for the delivery of effective policing at our worksites. According to the MOU, ExxonMobil can offer support such as transport, fuel, lodging and stipends for the police away from their normal work locations. ExxonMobil will continue to encourage the PNG Government to address security threats in areas adjoining its operations without directly assigning public security forces to the Project or its personnel, facilities and operations	x		Community health, safety and security management plan, EIS Chapter 13

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					Construction	Operation	
Social	Employment Project benefit streams	Reduced personal security due to the use of excessive force by the RPNGC or the Project's security personnel.	MM284	ExxonMobil will engage with public security forces (e.g., RPNGC, the Marine Police), host governments, and local communities to understand the impact of security arrangements on communities.	x		Community health, safety and security management plan
Social	Employment Project benefit streams	Reduced personal security due to the use of excessive force by the RPNGC or the Project's security personnel.	MM285	ExxonMobil will investigate allegations of force reported to be used by public security forces undertaking activities related to Project activities in consultation with public security forces.	x		Community health, safety and security management plan
Social	Employment Project benefit streams	Reduced personal security due to the use of excessive force by the RPNGC or the Project's security personnel.	MM286	Develop a Security Code of Conduct, which aligns with the recommendations of the VPSHR. Training aligned with the requirements of the VPSHR will be developed and delivered, on induction and annually on the Project's expectations and appropriate conduct towards workers and community members, including: exercising constraint and caution and understanding how force may be used; respecting human rights; gender sensitivity in the local cultural context and the Code of Conduct; behaving consistently; knowing and abiding by applicable laws; fostering good community relations through their interaction and behaviour towards the workforce and communities; not engaging in sexual exploitation or abuse of women, including any sexual activity with girls under the age of 18.	x		Community health, safety and security management plan, EIS Chapter 13
Social	Employment Project benefit streams	Reduced personal security due to the use of excessive force by the RPNGC or the Project's security personnel.	MM287	Screen security personnel prior to employment through detailed interviews in line with the 'International Code of Conduct for Private Security Service Providers' to avoid hiring those who have previously been involved in abuse or violation of human rights.	x		Community health, safety and security management plan, EIS Chapter 13
Social	Employment Project benefit streams	Reduced personal security due to the use of excessive force by the RPNGC or the Project's security personnel.	MM288	Ensure compliance of all security arrangements with the Project's Code of Conduct.	x		EIS Chapter 13
Social	Employment Project benefit streams	Reduced personal security due to the use of excessive force by the RPNGC or the Project's security personnel.	MM289	Ensure security personnel are unarmed.	x		EIS Chapter 13
Social	Employment Project benefit streams	Reduced personal security due to the use of excessive force by the RPNGC or the Project's security personnel.	MM290	Provide appropriate supervision to ensure that established procedures are being applied by security personnel.	x		EIS Chapter 13
Social	Employment Project benefit streams	Reduced personal security due to the use of excessive force by the RPNGC or the Project's security personnel.	MM291	Take immediate action if unlawful or abusive acts are committed by security personnel.	x		EIS Chapter 13
Social	Employment Project benefit streams	Reduced personal security due to the use of excessive force by the RPNGC or the Project's security personnel.	MM292	Report unlawful or abusive acts to public authorities.	x		EIS Chapter 13
Social	Employment Project benefit streams	Reduced personal security due to the use of excessive force by the RPNGC or the Project's security personnel.	MM293	Investigate credible allegations of unlawful behaviour or acts of abuse by private security personnel and take action (or urge the appropriate parties to take action).	x		Community health, safety and security management plan, EIS Chapter 13
Social	Project induced in-migration Employment Project construction and operation activities	An increase in the incidence of mosquito-borne diseases	MM294	Develop vector breeding source reduction procedures around Project activities to reduce vector proliferation. ExxonMobil and the Contractor will identify activities that may result in vector proliferation and will develop appropriate procedures to control and monitor vector proliferation.	x		Community health, safety and security management plan, EIS Chapter 13
Social	Project induced in-migration Employment Project construction and operation activities	An increase in the incidence of mosquito-borne diseases	MM295	Incorporate health design specifications into facility and infrastructure design	x		Community health, safety and security management plan, EIS Chapter 13
Social	Project induced in-migration Employment Project construction and operation activities	An increase in the incidence of mosquito-borne diseases	MM296	Develop an integrated malaria and vector control management plan that includes chemical control, case diagnosis and management, and workforce education.	x		Community health, safety and security management plan, EIS Chapter 13
Social	Project induced in-migration Employment Project construction and operation activities	An increase in the incidence of tuberculosis and respiratory diseases	MM297	ExxonMobil will consult with health stakeholders and evaluate the support of community malaria programs.	x		Community health, safety and security management plan, EIS Chapter 13
Social	Project induced in-migration Employment Project construction and operation activities	An increase in the incidence of tuberculosis and respiratory diseases	MM298	Develop and implement a workforce tuberculosis program that includes Project employees, all contractors and local laborers. The program will include pre-employment testing requirements, vaccination requirements, education, medical clearance requirements, and outbreak management response. ExxonMobil will consult with health stakeholders and evaluate the opportunity to develop a Community Tuberculosis Control Program as an extension of the workplace program.	x		Community health, safety and security management plan, EIS Chapter 13
Social	Project induced in-migration Employment Project construction and operation activities	An increase in the incidence of sanitation-related diseases	MM299	ExxonMobil will consult with health stakeholders and evaluate the opportunity to develop a Community Tuberculosis Control Program as an extension of the workplace program.	x		Community health, safety and security management plan
Social	Project induced in-migration Employment Project construction and operation activities	An increase in the incidence of sanitation-related diseases	MM300	Develop and implement an infectious disease outbreak management program for implementation within the ExxonMobil and contractor workforce to reduce and respond to outbreaks. This management program will include maintaining capability and capacity to screen for sanitation-related diseases that may pose an infectious risk or have outbreak potential to the workforce.	x		Community health, safety and security management plan, EIS Chapter 13
Social	Project induced in-migration Employment Project construction and operation activities	An increase in the incidence of sanitation-related diseases	MM301	Undertake longitudinal monitoring of water conditions in partnership with relevant community stakeholders.	x		Chapter 13 SIA
Social	Project induced in-migration Employment Project construction and operation activities	An increase in the incidence of sanitation-related diseases	MM302	ExxonMobil will consult with relevant stakeholders and to evaluate the need for water, sanitation and hygiene (WASH) projects in LNG Plant communities.	x		Chapter 13 SIA
Social	Project induced in-migration Employment Project construction and operation activities	An increase in the incidence of sanitation-related diseases	MM303	ExxonMobil will consult with relevant stakeholders and to evaluate the need for water, sanitation and hygiene (WASH) projects in LNG Plant communities.	x		Chapter 13 SIA
Social	Project induced in-migration Employment Project construction and operation activities	An increase in the incidence of sanitation-related diseases	MM304	Conduct education campaigns in the workforce on proper water use, hygiene and sanitation	x		Chapter 13 SIA
Social	Project induced in-migration Employment Project construction and operation activities	An increase in the incidence of sanitation-related diseases	MM305	Provide worker accommodation camps and work areas with sufficient potable water facilities, and conducting monitoring and surveillance activities to ensure water is potable	x		Chapter 13 SIA
Social	Project construction and operation activities	An increase in traffic incidents	MM306	Conduct education campaigns in the workforce on proper water use, hygiene and sanitation.	x		Community health, safety and security management plan
Social	Project construction and operation activities	An increase in traffic incidents	MM307	Enforcing speed restrictions on roads to minimise environmental and social impacts.	x		Community health, safety and security management plan, EIS Chapter 13
Social	Project construction and operation activities	An increase in traffic incidents	MM308	Avoid night driving as much as possible and implement reduced speeds for night driving.	x		Community health, safety and security management plan, EIS Chapter 13

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Aspect	Cause of impact (activity/event)	Impact	MM ID	Management Measure	Project phase		Source
					Construction	Operation	
Social	Project construction and operation activities	An increase in traffic incidents	MM309	Enforce drug and alcohol policies for all work-related vehicles, including contractor transport vehicles.	x		Community health, safety and security management plan, EIS Chapter 13
Social	Project construction and operation activities	An increase in traffic incidents	MM310	Developing and implementing driver competency requirements. All personnel will be required to demonstrate compliance with these requirements. The Contractor will maintain records of non-compliance and report these to ExxonMobil monthly	x		Community health, safety and security management plan, EIS Chapter 13
Social	Project construction and operation activities	An increase in traffic incidents	MM311	Establish and monitor driver hours and conditions to avoid driver fatigue.	x		Community health, safety and security management plan, EIS Chapter 13
Social	Project construction and operation activities	An increase in traffic incidents	MM312	Develop and implement a driver code of conduct. Contractors will develop a disciplinary procedure (subject to ExxonMobil approval) that will identify the process that will be followed if workers do not adhere to codes, rules and regulations.	x		Community health, safety and security management plan, EIS Chapter 13
Social	Project construction and operation activities	•An increase in traffic incidents •Increased travel times along Lea Lea Road during construction affecting general community and emergency services users.	MM313	Conduct traffic safety awareness training and community engagement programs within LNG Plant communities along the roads that Project vehicles drive to inform and educate communities on Project traffic and transport activities, road safety, and traffic conditions.	x		Community health, safety and security management plan, EIS Chapter 13
Social	Project construction and operation activities	•An increase in traffic incidents •Increased travel times along Lea Lea Road during construction affecting general community and emergency services users.	MM314	Limit the movement of employees and contractors to defined Project areas and use designated transport and transportation routes.	x		Community health, safety and security management plan, EIS Chapter 13
Social	Project construction and operation activities	•An increase in traffic incidents •Increased travel times along Lea Lea Road during construction affecting general community and emergency services users.	MM315	Work with local authorities and emergency services to prepare contingency plans to enable the passage of emergency vehicles during construction periods.	x		Community health, safety and security management plan, EIS Chapter 13
Social	Project construction and operation activities	An increase in traffic incidents	MM316	Implementing a convoy system for vehicles with significant loads where travel through communities is required.	x		Chapter 13
Social	Project construction and operation activities	Increased travel times along Lea Lea Road during construction affecting general community and emergency services users.	MM317	Identifying alternative transport routes to Lea Lea Road to avoid lane closures while upgrading Lea Lea Road.	x		Chapter 13
Social	Employment Project construction and operation activities	Reduced opportunity to engage in informal economy activities.	MM318	ExxonMobil will engage with potentially affected persons, community leaders, and government representatives regarding the requirements for market stall relocation due to road construction, including the identification of people who may require additional assistance during relocation activities.	x		Community development management plan, EIS Chapter 13
Social	Employment Project construction and operation activities	Reduced opportunity to engage in informal economy activities.	MM319	Αφφεχτεδ περσονσ ωιλλ βε αιδεδ ωιτη τρανσπορτινγ τηειρ βελονγινγσ το τηε ιδεντιφιεδ ρελοχατιον σιτεσ. ΕξξονΜοβιλ ωιλλ προπιδε αδδιτιοναλ ασσιστανχε το συλνεραβλε πεοπλε συνη ασ της ανεδ. πεοπλε ωιτη διασβιλιτιεσ, ανδ συνγλε φευαλε πουσπεολδσ.	x		Community development management plan, EIS Chapter 13
Social	Employment Project construction and operation activities	Reduced opportunity to engage in informal economy activities.	MM320	Undertake pre-construction surveys to identify the condition of market stalls prior to construction.	x		Community development management plan, EIS Chapter 13
Social	Employment Project construction and operation activities	The Project's activities may contribute to a reduction in the production of traditional handicrafts.	MM321	Maintain an understanding of and respect for cultural norms (language, ethnic affiliation, religion, social organisations, gender roles, rituals, forms of cultural expression, traditional techniques and activities, local leadership patterns) of local communities through consultation (with affected communities, traditional leaders, clan representatives, site users and minority groups) and foreign staff training (in local history and cultural practices, including site specific training relating to particular communities within the Project area).	x		Community development management plan, EIS Chapter 13
Social	Employment Project construction and operation activities	The Project's activities may contribute to a reduction in the production of traditional handicrafts.	MM322	Identify and support key cultural knowledge and activities of LNG Plant village communities to reduce the Project's impacts on these.	x		Community development management plan, EIS Chapter 13
Social	Employment Project benefit streams	Decreased food security due to inflation.	MM323	ExxonMobil will develop sustainable agricultural and fishery projects in partnership with government and non-government stakeholders. The projects will be identified and developed through needs-based assessments and community consultation and will aim to diversify and increase production in the LNG Plant villages through best practice techniques. Needs-based assessments and community consultation will take into account production activities by men, women and youth, and access rights to areas of impact. The project may include: •Helping establish market linkages between agricultural producers and fishers and potential customers, including the Project (e.g., support for cooperatives, local market infrastructure, procurement contracts). •Supporting access to equipment and other inputs (including through microfinance). •Helping to establish market linkages between producers and potential customers, including the Project (e.g., support for cooperatives, local market infrastructure, procurement contracts). •Undertaking projects to improve environmental conditions to support fishery and agricultural production (e.g., such as through the establishment of fishing aggregate devices).	x		Community development management plan, EIS Chapter 13
Social	Project construction and operation activities	Reduced availability and access to marine resources due to expanded marine exclusion zone.	Refer to MM323		x		Community development management plan, EIS Chapter 13
Social	Project construction and operation activities	Reduced availability and access to marine resources due to expanded marine exclusion zone.	MM324	ExxonMobil will undertake periodic monitoring of livelihoods within the LNG Plant communities across the Project's lifecycle to identify Project-related impacts community livelihood's and support the development of appropriate livelihood diversification projects.	x		Community development management plan, EIS Chapter 13
Social	Employment	Increased availability of funds to resource and maintain the capacity of community infrastructure (potential impact).	MM325	ExxonMobil will direct community investment to education and health initiatives that will support the identified needs and priorities of affected communities and will complement the role and responsibility of the Government of Papua New Guinea. Long-term projects will be selected on their capacity to become self-perpetuating and not dependent on long-term funding.	x		Community development management plan, EIS Chapter 13

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Aspect	Cause of impact (activity/event)	Impact	MM ID	Management Measure	Project phase		Source
					Construction	Operation	
Traffic	Construction of new or upgrading existing roads	•Exposure of soil leading to generation of dust and sedimentation downstream. •Contamination of soils and /or surface water drainages as a result of leaks and spills from equipment. •Reduced population numbers and viability of native plants and animals, •Fragmentation/partitioning of habitat. •Altered hydrological regimes to surface water drainages (increased or diminished flows). •Positive community benefits (economic and livelihoods). •In-migration and subsequent impacts. •Reduced opportunity to engage in informal economy activities for stallholders being temporarily relocated. •Decreased amenity for sensitive receptors. •Increased safety and amenity issues for the community and employees.	MM326	Preferentially upgrade existing Project roads rather than building new ones, wherever practicable.	x		Traffic Management Plan
Traffic	Construction of new or upgrading existing roads	•Exposure of soil leading to generation of dust and sedimentation downstream. •Contamination of soils and /or surface water drainages as a result of leaks and spills from equipment. •Reduced population numbers and viability of native plants and animals, •Fragmentation/partitioning of habitat. •Altered hydrological regimes to surface water drainages (increased or diminished flows). •Positive community benefits (economic and livelihoods). •In-migration and subsequent impacts. •Reduced opportunity to engage in informal economy activities for stallholders being temporarily relocated. •Decreased amenity for sensitive receptors. •Increased safety and amenity issues for the community and employees.	MM327	Limit ground disturbance and vegetation clearing to areas required for the new plant facilities.	x		Traffic Management Plan
Traffic	Construction of new or upgrading existing roads	•Exposure of soil leading to generation of dust and sedimentation downstream. •Contamination of soils and /or surface water drainages as a result of leaks and spills from equipment. •Reduced population numbers and viability of native plants and animals, •Fragmentation/partitioning of habitat. •Altered hydrological regimes to surface water drainages (increased or diminished flows). •Positive community benefits (economic and livelihoods). •In-migration and subsequent impacts. •Reduced opportunity to engage in informal economy activities for stallholders being temporarily relocated. •Decreased amenity for sensitive receptors. •Increased safety and amenity issues for the community and employees.	MM328	The construction of roads through natural drainage routes will be avoided to the extent practicable. If this is not practicable, the following mitigation measures will be implemented: •Minimise and consolidate the number of crossings of natural drainage channels. •Minimise the width of roadways to that necessary for the safe transport of personnel and equipment. •Construct sufficient culverts to enable fauna passage and maintain stream connectivity.	x		Traffic Management Plan
Traffic	Construction of new or upgrading existing roads	•Exposure of soil leading to generation of dust and sedimentation downstream. •Contamination of soils and /or surface water drainages as a result of leaks and spills from equipment. •Reduced population numbers and viability of native plants and animals, •Fragmentation/partitioning of habitat. •Altered hydrological regimes to surface water drainages (increased or diminished flows). •Positive community benefits (economic and livelihoods). •In-migration and subsequent impacts. •Reduced opportunity to engage in informal economy activities for stallholders being temporarily relocated. •Decreased amenity for sensitive receptors. •Increased safety and amenity issues for the community and employees.	MM329	Implement good industry practice erosion control measures downstream of construction areas.	x		Traffic Management Plan
Traffic	Construction of new or upgrading existing roads	•Exposure of soil leading to generation of dust and sedimentation downstream. •Contamination of soils and /or surface water drainages as a result of leaks and spills from equipment. •Reduced population numbers and viability of native plants and animals, •Fragmentation/partitioning of habitat. •Altered hydrological regimes to surface water drainages (increased or diminished flows). •Positive community benefits (economic and livelihoods). •In-migration and subsequent impacts. •Reduced opportunity to engage in informal economy activities for stallholders being temporarily relocated. •Decreased amenity for sensitive receptors. •Increased safety and amenity issues for the community and employees.	MM330	Limit clearing of riparian vegetation to the areas necessary to undertake construction activities safely. Prevent construction personnel from entering areas outside of project-related activities to minimise damage to vegetation.	x		Traffic Management Plan

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Aspect	Cause of impact (activity/event)	Impact	MM ID	Management Measure	Project phase		Source
					Construction	Operation	
Traffic	Construction of new or upgrading existing roads	•Exposure of soil leading to generation of dust and sedimentation downstream. •Contamination of soils and /or surface water drainages as a result of leaks and spills from equipment. •Reduced population numbers and viability of native plants and animals, •Fragmentation/partitioning of habitat. •Altered hydrological regimes to surface water drainages (increased or diminished flows). •Positive community benefits (economic and livelihoods). •In-migration and subsequent impacts. •Reduced opportunity to engage in informal economy activities for stallholders being temporarily relocated. •Decreased amenity for sensitive receptors. •Increased safety and amenity issues for the community and employees.	MM331	Engage with relevant stakeholders on traffic prior to starting activities in line with ExxonMobil Stakeholder Engagement Plan.	x		Traffic Management Plan
Traffic	Construction of new or upgrading existing roads	•Exposure of soil leading to generation of dust and sedimentation downstream. •Contamination of soils and /or surface water drainages as a result of leaks and spills from equipment. •Reduced population numbers and viability of native plants and animals, •Fragmentation/partitioning of habitat. •Altered hydrological regimes to surface water drainages (increased or diminished flows). •Positive community benefits (economic and livelihoods). •In-migration and subsequent impacts. •Reduced opportunity to engage in informal economy activities for stallholders being temporarily relocated. •Decreased amenity for sensitive receptors. •Increased safety and amenity issues for the community and employees.	MM332	Reinstate disturbed areas to former landforms as far as practicable and revegetate exposed areas as soon as practicable once construction activities are completed in particular locations. Erosion-prone areas will receive particular attention.	x		Traffic Management Plan
Traffic	Vehicle movements required to transport material and personnel	•Decreased amenity for sensitive receptors. •Increased traffic disruptions, travel times and wear and tear on roads on road users. •Increased dust deposition on affecting plants vegetation and communities, •Potential injury or death of: - oDomestic animals - oWildlife, or, - oWorkers/local community members.	MM333	Limit, where possible, work vehicles and machinery to designated access and work areas and discourage the land-based transportation of Project equipment to limit vehicle traffic to the Project area, thereby reducing the motivation for in-migration.	x		Traffic Management Plan
Traffic	Vehicle movements required to transport material and personnel	•Decreased amenity for sensitive receptors. •Increased traffic disruptions, travel times and wear and tear on roads on road users. •Increased dust deposition on affecting plants vegetation and communities, •Potential injury or death of: - oDomestic animals - oWildlife, or, - oWorkers/local community members.	MM334	Limit the movement of employees and contractors to defined Project areas, using designated transport and transportation routes.	x		Traffic Management Plan
Traffic	Vehicle movements required to transport material and personnel	•Decreased amenity for sensitive receptors. •Increased traffic disruptions, travel times and wear and tear on roads on road users. •Increased dust deposition on affecting plants vegetation and communities, •Potential injury or death of: - oDomestic animals - oWildlife, or, - oWorkers/local community members.	MM335	Optimise transport logistics (equipment, products and people) as far as practicable, use of energy-efficient vehicles and machinery, and maintain them in good working condition to reduce fuel consumption.	x		Traffic Management Plan
Traffic	Vehicle movements required to transport material and personnel	•Decreased amenity for sensitive receptors. •Increased traffic disruptions, travel times and wear and tear on roads on road users. •Increased dust deposition on affecting plants vegetation and communities, •Potential injury or death of: - oDomestic animals - oWildlife, or, - oWorkers/local community members.	MM336	Implement a convoy system will be implemented for vehicles with significant loads when travelling through communities as required in using a risk-based approach.	x		Traffic Management Plan
Traffic	Vehicle movements required to transport material and personnel	•Decreased amenity for sensitive receptors. •Increased traffic disruptions, travel times and wear and tear on roads on road users. •Increased dust deposition on affecting plants vegetation and communities, •Potential injury or death of: - oDomestic animals - oWildlife, or, - oWorkers/local community members.	MM337	Enforce speed restrictions on roads to minimise environmental and social impacts.	x		Traffic Management Plan

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Aspect	Cause of impact (activity/event)	Impact	MM ID	Management Measure	Project phase		Source
					Construction	Operation	
Traffic	Vehicle movements required to transport material and personnel	•Decreased amenity for sensitive receptors. •Increased traffic disruptions, travel times and wear and tear on roads on road users. •Increased dust deposition on affecting plants vegetation and communities, •Potential injury or death of: oDomestic animals oWildlife, or. oWorkers/local community members.	MM338	Develop and implement driver competency requirements. All personnel will be required to demonstrate compliance with these requirements. The Contractor will maintain records of non-compliance and report these to ExxonMobil monthly.	x		Traffic Management Plan
Traffic	Vehicle movements required to transport material and personnel	•Decreased amenity for sensitive receptors. •Increased traffic disruptions, travel times and wear and tear on roads on road users. •Increased dust deposition on affecting plants vegetation and communities, •Potential injury or death of: oDomestic animals oWildlife, or. oWorkers/local community members.	MM339	Avoiding night driving as much as possible and implementing reduced speeds for night driving.	x		Traffic Management Plan
Traffic	Vehicle movements required to transport material and personnel	•Decreased amenity for sensitive receptors. •Increased traffic disruptions, travel times and wear and tear on roads on road users. •Increased dust deposition on affecting plants vegetation and communities, •Potential injury or death of: oDomestic animals oWildlife, or. oWorkers/local community members.	MM340	Apply adequate dust control strategies will be applied to minimise dust deposition and reduce sedimentation in drainage lines.	x		Traffic Management Plan
Traffic	Vehicle movements required to transport material and personnel	•Decreased amenity for sensitive receptors. •Increased traffic disruptions, travel times and wear and tear on roads on road users. •Increased dust deposition on affecting plants vegetation and communities, •Potential injury or death of: oDomestic animals oWildlife, or. oWorkers/local community members.	MM341	Enforce drug and alcohol policies for all work-related vehicles, including contractor transport vehicles.	x		Traffic Management Plan
Traffic	Vehicle movements required to transport material and personnel	•Decreased amenity for sensitive receptors. •Increased traffic disruptions, travel times and wear and tear on roads on road users. •Increased dust deposition on affecting plants vegetation and communities, •Potential injury or death of: oDomestic animals oWildlife, or. oWorkers/local community members.	Refer to MM311		x		Traffic Management Plan
Traffic	Vehicle movements required to transport material and personnel	•Decreased amenity for sensitive receptors. •Increased traffic disruptions, travel times and wear and tear on roads on road users. •Increased dust deposition on affecting plants vegetation and communities, •Potential injury or death of: oDomestic animals oWildlife, or. oWorkers/local community members.	MM342	Maintain an emergency response capability to provide emergency assistance for drivers and third parties involved in project related traffic incidents.	x		Traffic Management Plan
Traffic	Vehicle movements required to transport material and personnel	•Decreased amenity for sensitive receptors. •Increased traffic disruptions, travel times and wear and tear on roads on road users. •Increased dust deposition on affecting plants vegetation and communities, •Potential injury or death of: oDomestic animals oWildlife, or. oWorkers/local community members.	MM343	Work with local authorities and emergency services to prepare contingency plans to enable the passage of emergency vehicles during construction periods.	x		Traffic Management Plan
Traffic	Vehicle movements required to transport material and personnel	•Decreased amenity for sensitive receptors. •Increased traffic disruptions, travel times and wear and tear on roads on road users. •Increased dust deposition on affecting plants vegetation and communities, •Potential injury or death of: oDomestic animals oWildlife, or. oWorkers/local community members.	MM344	Develop and implement a driver code of conduct. The Contractor will maintain records of non-compliance and report these to ExxonMobil monthly. Contractors will develop a disciplinary procedure (subject to ExxonMobil approval) that will identify the process that will be followed if workers do not adhere to any code or rules and regulations	x		Traffic Management Plan

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Aspect	Cause of impact (activity/event)	Impact	MM ID	Management Measure	Project phase		Source
					Construction	Operation	
Traffic	Vehicle movements required to transport material and personnel	•Decreased amenity for sensitive receptors. •Increased traffic disruptions, travel times and wear and tear on roads on road users. •Increased dust deposition on affecting plants vegetation and communities, •Potential injury or death of: oDomestic animals oWildlife, or. oWorkers/local community members.	Refer to MM313		x		Traffic Management Plan
Traffic	Machinery and vehicles travelling outside of defined construction areas or unauthorised use of vehicles and Project roads	•Decreased amenity for sensitive receptors. •Increased traffic disruptions, travel times and wear and tear on roads on road users. •Increased dust deposition on affecting plants vegetation and communities, •Potential injury or death of: oDomestic animals oWildlife, or. oWorkers/local community members.	MM345	Limit the movement of employees and contractors to defined Project areas, using designated transport and transportation routes.	x		Traffic Management Plan
Traffic	Machinery and vehicles travelling outside of defined construction areas or unauthorised use of vehicles and Project roads	•Decreased amenity for sensitive receptors. •Increased traffic disruptions, travel times and wear and tear on roads on road users. •Increased dust deposition on affecting plants vegetation and communities, •Potential injury or death of: oDomestic animals oWildlife, or. oWorkers/local community members.	MM346	Establish security procedures and secure project vehicles and equipment to prevent unauthorised access to and use of vehicles at worksites, inside camps and laydown areas and at 'outside the fence' areas where vehicles may be parked or left while not in use.	x		Traffic Management Plan
Traffic	Driver behaviour or inappropriate vehicle maintenance.	•Injury or death of: oDomestic animals oWildlife, or. oWorkers/local community members	Refer to MM308		x		Traffic Management Plan
Traffic	Driver behaviour or inappropriate vehicle maintenance.	•Injury or death of: oDomestic animals oWildlife, or. oWorkers/local community members	MM347	Service and regularly maintain vehicles and equipment to prevent accidental leaks.	x		Traffic Management Plan
Traffic	Driver behaviour or inappropriate vehicle maintenance.	•Injury or death of: oDomestic animals oWildlife, or. oWorkers/local community members	MM348	Conduct pre-trip vehicle inspections prior to any trip.	x		Traffic Management Plan
Traffic	Driver behaviour or inappropriate vehicle maintenance.	•Injury or death of: oDomestic animals oWildlife, or. oWorkers/local community members	MM349	Install speed tracking systems in site-based project vehicles.	x		Traffic Management Plan
Traffic	Driver behaviour or inappropriate vehicle maintenance.	•Injury or death of: oDomestic animals oWildlife, or. oWorkers/local community members	MM350	Manage mobile equipment and machinery through assessing the operator's fitness to work as drivers, supported by specific medical surveillance programs.	x		Traffic Management Plan
Traffic	Driver behaviour or inappropriate vehicle maintenance.	•Injury or death of: oDomestic animals oWildlife, or. oWorkers/local community members	MM351	Strictly enforce drug and alcohol policies for all work-related vehicles	x		Traffic Management Plan
Traffic	Driver behaviour or inappropriate vehicle maintenance.	•Injury or death of: oDomestic animals oWildlife, or. oWorkers/local community members	MM352	Implement employee and contractor management for Project transport vehicles, including specific driving training, rest periods and roadworthiness assessment.	x		Traffic Management Plan
Traffic	Driver behaviour or inappropriate vehicle maintenance.	•Injury or death of: oDomestic animals oWildlife, or. oWorkers/local community members	Refer to MM297		x		Traffic Management Plan
Traffic	Driver behaviour or inappropriate vehicle maintenance.	•Injury or death of: oDomestic animals oWildlife, or. oWorkers/local community members	MM353	Develop and implement driver competency requirements, and ensure that all personnel who will, or may, drive have demonstrated compliance with the competency requirements. Records are to be kept, including evidence of a valid driver's license, and any other competency required for the driving task at hand.	x		Traffic Management Plan
Traffic	Driver behaviour or inappropriate vehicle maintenance.	•Injury or death of: oDomestic animals oWildlife, or. oWorkers/local community members	Refer to MM311		x		Traffic Management Plan
Traffic	Driver behaviour or inappropriate vehicle maintenance.	•Injury or death of: oDomestic animals oWildlife, or. oWorkers/local community members	MM354	Develop and implement a code of conduct for drivers covering expected driving behaviours towards the local community; monitor adherence and enforce strict consequences for breaches.	x		Traffic Management Plan
Traffic	Driver behaviour or inappropriate vehicle maintenance.	•Injury or death of: oDomestic animals oWildlife, or. oWorkers/local community members	MM355	Include procedures and rules that help avoid unnecessary rapid acceleration, breaking, revving of engines and use of horns.	x		Traffic Management Plan
Traffic	Driver behaviour or inappropriate vehicle maintenance.	•Injury or death of: oDomestic animals oWildlife, or. oWorkers/local community members	MM356	Provide training to drivers regarding procedures to follow in the event of a collision. A logbook will be placed within each vehicle to record animal deaths and injuries.	x		Traffic Management Plan

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Aspect	Cause of impact (activity/event)	Impact	MM ID	Management Measure	Project phase		Source
					Construction	Operation	
Traffic	Driver behaviour or inappropriate vehicle maintenance.	•Injury or death of: oDomestic animals oWildlife, or. oWorkers/local community members	Refer to MM313		x		Traffic Management Plan
Social	Employment	•Improved opportunities for wage-based employment during construction and operation. •Improved opportunities for skill development during construction and operations.	Refer to MM263		x		EIS Chapter 13
Social	Employment	•Improved opportunities for wage-based employment during construction and operation. •Improved opportunities for skill development during construction and operations.	MM357	The EPC contractor will identify anticipated workforce requirements and develop relevant training plans based on these. Training will be developed through the following pre-defined training areas: •Project site induction training, which will be developed by Project contractors to adequately enable the efficient and safe operation of the worksite. •Basic skills introductory craft skills training, which will be developed and conducted by the contractors to develop soft skills and job-specific skills of the basic-skilled workforce. The training will be designed so that individuals that complete the training plus on-the-job training can be certified according to recognised standards in PNG. •Relevant on-the-job skills training, which contractors will develop to enable workers to gain official technical certificates through a recognised certification body. •Project and contractor-led semi-skilled training, which the Project will develop through identifying and partnering with training facilities to develop curricula and the capacity to deliver relevant semi-skilled craft training. In addition, Contractors will be expected to establish temporary programs tailored to the work packages or leverage existing programs to meet Project standards. •Demobilisation career planning, which will be developed by the contractor to effectively demobilise Papua New Guinean personnel from Project-related employment, including proof of employment, training and certifications, and potential employment with other large infrastructure projects. The demobilisation plans will account for preparing workers for large layoffs after peak construction. •Internships, which will be established by contactors, and by ExxonMobil in its operating organisation, are planned to be established in collaboration with Papua New Guinea's higher education institutions, to provide recent graduates with practical knowledge and experience. •ExxonMobil will continue to undertake training for operational roles through in-house training, on the job training, and externally delivered courses.	x	x	EIS Chapter 13
Social	Employment	•Improved opportunities for wage-based employment during construction and operation. •Improved opportunities for skill development during construction and operations.	MM358	ExxonMobil will continue to work with TAFE-delivered Vocational Education and Training to support the development of the construction and operational workforce.	x	x	EIS Chapter 13
Social	Employment	•Improved opportunities for wage-based employment during construction and operation •Improved opportunities for skill development during construction and operations	MM359	ExxonMobil will continue to undertake training for operational roles through in-house training, on the job training, and externally delivered courses.	x	x	EIS Chapter 13
Social	Employment	Improved opportunities for wage-based employment for women.	MM360	ExxonMobil and contractors will develop recruitment practices that promote the employment of women. Contractors will include measures that address the recruitment of women in the recruitment plans and monitor and report to ExxonMobil on the employment of women.	x	x	EIS Chapter 13
Social	Employment	Improved opportunities for wage-based employment for women.	MM361	ExxonMobil will provide educational and training opportunities and support for women, through: •Continuing to support the scholarship program with the Business and Professional Women's Club, and specifically, the Decie Autin Engineering Scholarship, which supports women to undertake engineering studies. •Continuing to support the Women in Energy Network, which is an ExxonMobil-led initiative that was established to support and encourage professional growth in women working with ExxonMobil.	x	x	EIS Chapter 13
Social	Employment	Improved opportunities for wage-based employment for women.	MM362	ExxonMobil will support broader initiatives to support women's economic advancement and workforce participation in Papua New Guinea, through: •Continuing to support the PNG Women's Forum, which contributes funding to improve national policy affecting women in Papua New Guinea. •Continuing working with the Business Coalition for Women, which works to enhance positive change for women and businesses in Papua New Guinea. •Continuing to support Papua New Guinean women to attend the Global Women in Management training program through the ExxonMobil Women's Economic Opportunity Initiative. •Continuing to support the Advancing PNG: Women Leaders Network, which supports the Papua New Guinean Global Women in Management alumni.	x	x	EIS Chapter 13
Social	Procurement	Improved opportunities for enterprise-based activities during construction and operation Increased capacity of enterprises.	MM363	A commitment to use and purchase Papua New Guinean goods and services wherever they are comparable to foreign-sourced suppliers in terms of cost, availability, quality, and are specification compliant.	x	x	EIS Chapter 13
Social	Procurement	•Improved opportunities for enterprise-based activities during construction and operation •Increased capacity of enterprises.	MM364	Contractors will be required to develop National Content Plans that will identify what goods and services are required for the work package, where Papua New Guinean-owned companies could participate, and how the contactor will increase the participation of these companies.	x	x	EIS Chapter 13

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Aspect	Cause of impact (activity/event)	Impact	MM ID	Management Measure	Project phase		Source
					Construction	Operation	
Social	Procurement	•Improved opportunities for enterprise-based activities during construction and operation •Increased capacity of enterprises.	MM365	Continuing support for the IBBM Enterprise Development Centre, and use of the Centre's services to support the Project through: •Undertaking an non-technical assessment of Papua New Guinean business capacity gaps considering the Project's anticipated needs to inform the development and delivery of business training courses. •Supplier outreach and registration, including the launch of a supplier management portal platform. The supplier management portal will allow for Papua New Guinean businesses to register, and pre-verify their credentials, and receive procurement notices, and other Project communications. •Contractors will be required to utilise the Centre's supplier management portal for the dissemination of contracting opportunities.	x	x	EIS Chapter 13
Social	Procurement	•Improved opportunities for enterprise-based activities during construction and operation •Increased capacity of enterprises.	MM366	ExxonMobil will engage with relevant industry stakeholders directly and through the IBBM Enterprise Development Centre to provide information about the status of the Project and National Content progress.	x	x	EIS Chapter 13
Social	Procurement	•Improved opportunities for enterprise-based activities during construction and operation •Increased capacity of enterprises.	MM367	ExxonMobil will encourage the IBBM Enterprise Development Centre to identify through its member banks ways to improve access to finance for Papua New Guinean suppliers, including through industry engagement and education.	x	x	EIS Chapter 13
Social	Employment	Reduced availability of skilled workforce for other industries.	Refer to MM359		x	x	EIS Chapter 13
Social	Employment Procurement	Decreased community cohesion due to unequal distribution of Project's employment and business development opportunities.	MM368	ExxonMobil and its Contractors will monitor the distribution of employment across LNG Plant villages to identify any trends. Contractors will report on employment to ExxonMobil on a monthly basis.	x	x	EIS Chapter 13
Social	Employment Procurement	Decreased community cohesion due to unequal distribution of Project's employment and business development opportunities.	MM369	ExxonMobil will engage with relevant LNG Plant community stakeholders to identify any emerging concerns regarding inequitable access to employment.	x	x	EIS Chapter 13
Social	Employment Procurement	Decreased community cohesion due to unequal distribution of Project's employment and business development opportunities.	MM370	ExxonMobil and contractors will use objective and transparent selection criteria aligned to the requirements of the available jobs to select workers. Local workers not selected will be informed of the reason for this.	x	x	EIS Chapter 13
Social	Employment Procurement	Decreased community cohesion due to unequal distribution of Project's employment and business development opportunities.	MM371	ExxonMobil and contractors will prepare a conflict-of-interest declaration for any recruitment or procurement decision, which includes a hierarchy of review of decisions.	x	x	EIS Chapter 13
Social	Employment Procurement	Decreased community cohesion due to unequal distribution of Project's employment and business development opportunities.	MM372	ExxonMobil will monitor issues and grievances lodged through the Community Grievance Mechanism regarding access and equity to employment opportunities.	x	x	EIS Chapter 13