



**Rovuma**  
**LNG**

**ENVIRONMENTAL AND SOCIAL  
REQUIREMENTS FOR CONTRACTORS:  
ANNEX 6 - ROAD TRAFFIC AND TRANSPORT**

**ROVUMA LNG PROJECT**


**MZLN-EL-RBENV-00-0001**

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## 1. PURPOSE AND SCOPE

This document is one of a series of topic-specific supporting annexes contained in the overarching document: Environmental and Social Requirements for Contractors: Environmental and Social Management System (ESMS).

These annexes define the processes that need to be followed and the control measures that must be applied to ensure the delivery and approval of a topic-specific Contractor Implementation Plan (CIP) and other implementation deliverables ahead of commencing activity.

Where the final design basis or execution strategy has not been determined and alternatives exist, an analysis of alternatives (taking environmental and social (E&S) factors into account) shall be undertaken. This analysis shall be based on an accurate characterisation of the local setting using up-to-date baseline data and an assessment of the risks and impacts related to each alternative.

Where the project base case has already been determined, additional baseline information may be required to inform an up-to-date / site-specific E&S risks and impacts evaluation. This evaluation may result in a refinement of control measures relative to the local conditions and licensing requirements.

### 1.1. Objectives

The overall objective of this document is to set out all the E&S requirements that need to be fulfilled in order to prevent and manage potential E&S risks and impacts associated with road traffic and transport.

### 1.2. Scope

For the purposes of this document, Road Traffic and Transport encompasses the assessment and management of E&S risks and impacts associated with the following activities: siting and construction of new roads; upgrades to existing roads, vehicle movements (routing, traffic management), vehicle inspection and maintenance, driver controls, community health and safety (related to traffic), and reinstatement of roads. Special requirements relating to the construction of roads through wetlands are included in this document. Requirements relating to refuelling and the transportation of hazardous materials are covered in the Hazardous Materials Requirements Annex. Marine transport is covered in the Marine Operations Annex.

This document follows the overall Scope definition outlined in the ESMS Requirements for Contractors described in Section 2.2 of that document.

### 1.3. Linkage to Other Contractor Requirements

This document is an overarching document which is supported by a number of topic-specific annexes. It also needs to be read in conjunction with Section D (Scope of Work) and Section F (Coordination Procedure) to provide a holistic view of E&S requirements.

This document should be read specifically in conjunction with the Hazardous Materials Annex and the Raw Materials and Aggregates Annex. Where additional land is required, the requirements in the Additional Land Access Protocol document shall be followed.

#### 1.4. Background Context

Road traffic and transport activities are associated with a number of potential environmental and social risks and impacts. The project will increase traffic (potentially significantly) depending on the supply strategy for aggregates and other goods and services. The simple presence of EMMML and the Anadarko LNG project creates the potential for in-migration (people looking for job or economic opportunities) and associated increases in traffic. While the level of project traffic is likely to decrease significantly in the operations phase, potential industrial development of the Afungi peninsula and tourism development in the vicinity may lead to much higher traffic levels than would be the case as a result of EMMML and Anadarko LNG operations alone.

#### 1.5. E&S Risks and Potential Impacts

Table 1-1 outlines the E&S risks and potential impacts identified to date associated with Road Traffic and Transportation. This table is meant to provide insight to the risks and potential impacts which are possible and a guide for additional assessment activities required by Section 2.1 of this document. It also provides a reference to the control measures tables (Table 2-3).

**Table 1-1: A Guide to Activities, Consequences, Risks and Potential Impacts**

Activity	Potential Consequence	Risks And Potential Impacts
Building or upgrading new roads	Infrastructure creation	Reduced population numbers and viability of native plants and animals, including listed species (NR1) Fragmentation / partitioning of habitat (physical barrier) (NR2) Altered hydrological regimes to wetlands (increased or diminished flows and accumulations) (NR6) Positive community benefits (C10) Positive economic or livelihood benefits (LH3) Project induced in-migration and subsequent impacts (C9)
Vehicle movements required to transport materials and people to and from site	Dust generation	Dust deposition on important plants restricting growth (P7) Community disturbance / nuisance (C1) Detrimental impact on community health (C2) Reduced visibility resulting in additional road safety concerns (C11)
	Noise generation	Community disturbance / nuisance (C1) Disturbance of important environmentally sensitive receptors (NR7)
	Increased traffic	Detrimental impacts on local economy or livelihoods (LH2) Community disturbance / nuisance (C1) Damage to community infrastructure (C4) Project induced in-migration and subsequent impacts (C9) Disturbance of important environmentally sensitive receptors (NR7)
	Road accidents	Injury or death of domestic animals and wildlife (NR8)



<b>Activity</b>	<b>Potential Consequence</b>	<b>Risks And Potential Impacts</b>
		Detrimental impact on community safety (C3)
	Vibration	Damage to community infrastructure (C4)
	Air pollution and greenhouse gas emissions (GHG)	Degradation of ambient air quality (P1) Detrimental impact on community health (C2) Contribution to total country GHG emissions (P2)
Driving (driver Behavior)	Road accidents	Injury or death of domestic animals and wildlife (NR8) Detrimental impact on community safety (C3)
Unauthorized use of vehicles	Joy riding / road accidents	Detrimental impact on community safety (C3)

## 2. REQUIREMENTS

### 2.1. E&S Assessment and Evaluation and CIP Development

As discussed in the overarching Environmental and Social Requirements for Contractors: Environmental and Social Management System (Section 2), due to the further refinement of the design since the EIA was prepared, and due to the Project seeking finance (which requires compliance with the International Finance Corporation (IFC) E&S requirements), it is anticipated that additional E&S assessment will be required for some topics which may result in the addition or refinement of E&S controls specified to date. This assessment, as outlined in the overarching ESMS document, includes three stages:

- Stage 1: Analysis of Alternatives
- Stage 2: E&S risk and impact evaluation of the project base case and refinement of control measures
- Stage 3: CIP development (based on the refined control measures).

For Road Traffic and Transport, all 3 stages are required.

Stage 1 – Assessing Alternatives to Develop a Project Base Case

The requirements outlined in Table 2-1 must be completed in order to assess alternatives and determine the Project base case.

**Table 2-1: Process for Analysis of Alternatives**

Step	Specific Requirements	Responsibility
1	Collect relevant environmental and social baseline for all road traffic routes for any new roads that may be constructed by the Contractor off the DUAT including (but not limited to) the following: <i>Environmental:</i> habitat type along the routes, location of any areas of environmental significance such as protected areas, wetlands, important trees (as identified in EIA), identification of areas of high animal mortality rates caused by vehicular activity <i>Social:</i> location and population of communities, hospitals, schools, agriculture / livelihoods, types of buildings and proximity, current level of traffic, road condition and type (tarmac / other); cultural heritage features Document the results of the baseline assessment including the method of baseline collection.	Contractor
2	Outline what is planned to be transported by road; routing alternatives, number of trucks, timing of transport (season and time of day); who will be carrying out the transport (i.e. will it be subcontracted?).	Contractor
3	Carry out and document an alternatives analysis on all traffic routes being contemplated considering E&S risks and impacts identified in Table 1-1 and select final road transport route(s). The documentation shall include description of route alternatives, E&S baseline, methodology for collection of any new baseline data, risk and impact evaluation method and results, assessment of alternatives and final decision on agreed routes.	Company

## Stage 2 – Assessing the Project Base Case and Refining Control Measures


Once the route options and other factors for road traffic and transport have been determined, the actions outlined in Table 2-2 are required in order to refine the preliminary E&S control measures outlined in Section 2.2.

**Table 2-2: Process for Risk and Impact Assessment of Project Base Case**

No	Specific Requirements	Responsibility
1	Update (as required) what is planned to be transported by road; routes, number of trucks, timing of transport (season and time of day); who will be carrying out the transport (e.g., is it subcontracted?). This may form part of the overall supply and logistics strategy.	Contractor
2	Once the project base case is defined, determine if additional baseline data is needed.	Contractor
3	If required and approved by Company, collect additional (more detailed) E&S baseline information on selected transport routes considering (but not limited to) the following: <i>Environmental:</i> habitat type along the routes, location of any areas of environmental significance such as protected areas, wetlands, and important trees (as identified in the EIA). <i>Social:</i> location and population of communities, hospitals, schools, agriculture / livelihoods, market places, nearby public gathering spaces, places of worship or religious significance, types of buildings and proximity, current level of traffic, state of the roads and road type (tarmac / other), and cultural heritage features.	Contractor
4	Refine E&S risk and impact evaluation on final traffic routes considering, at minimum, the risks and impacts identified in Table 1-1 and findings from any new baseline data, if collected.	Contractor
5	Carry out or refine cumulative impact assessment, as required.	Company
6	Assess whether the design and / or execution strategy needs to be modified or optimised in the light of knowledge gained from the above steps.	Contractor
7	Assess whether there are sufficient / appropriate control measures in Table 2-3 to mitigate the identified risks and impacts and update and refine as necessary.	Contractor
8	Document results including a summary of the project description for Road Traffic and Transport (final design basis and execution strategy), summary of the E&S baseline, E&S risk and impact evaluation methodology and results, and the list of updated and refined control measures to be applied.	Contractor

## Stage 3 – Contractor Implementation Plan

The Contractor shall develop a CIP which outlines how they propose to implement the control measures in the Table 2-3 (including any proposed additions or refinements as applicable to the update and finalisation of the design and execution strategy), and how they propose to implement the management system requirements (as outlined in the E&S Management System Requirements for Contractors) which relate specifically to the topic of this document, in a way that conforms to E&S requirements. The CIP shall include the refined control measures developed in Stage 2.

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## 2.2. E&S Control Measures

The control measures in Table 2-3 have been defined ahead of the site-specific risk / impact evaluations defined in Section 2.1. The Contractor shall apply these or seek agreement to apply a refined list, with justification for all changes based on the outcomes of assessments described in Section 2.1.

Where these requirements originate from the Anadarko / Eni EIA (2014), henceforth called the EIA, the EIA section reference is included. Similarly, the Government-approved Environmental Management Plans (EMPs) references are included for those relevant controls. As noted in the overarching ESMS requirements document, a number of additional controls have been identified as being required to meet lender expectations. As such, the EIA / EMP controls have been supplemented by good practice design and control requirements where practicable and appropriate, however, where any overlap is present, the EMP (and EIA) commitments should be considered paramount over good practice guidance in the hierarchy of adoption of such controls.



**Table 2-3: E&S Control Measures**

ACTIVITY / SOURCE OF POTENTIAL IMPACT	CONTROL MEASURE	SOURCE			Notes
		EIA	EMP	Other	
<b>Overarching Requirements</b>					
<b>General</b>	Where possible, limit work vehicles and machinery to designated access and work site areas, and discourage the land-based transportation of Project equipment to limit vehicle traffic to the Afungi Project Site, thereby reducing the motivation for in-migrants to follow Project vehicles towards the Project Camp and work sites.	EIA 13.4.4	Area 4 SE 22		
	Select road transportation routes that avoid communities and their sensitive community locations (e.g. schools and hospitals) and community activities (e.g. livelihood areas) to the extent reasonably practicable.			A	
	Wherever possible, upgrade existing roads rather than building new ones.		Area 4 SW 21 Shared SW 18		
<b>Design Requirements</b>					
<b>Building or upgrading roads</b>	The construction of roads in wetland systems or through natural drainage routes will be avoided to the extent practicable. In the event that 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.	EIA 12.12.4	Area 4 AV 10 Shared AV 10		
	To the extent practical, locate roads away from wetland areas to limit the erosion and sediment infiltration to wetlands.	EIA 12.9.4 EIA 12.9.5	Shared SW 23, 34 LNGMT SW 23		

			MOF SW 23		
	Minimise removal of trees greater than 20cm diameter at breast height (DBH) to the extent reasonably practicable.			A	
	Minimise road construction through high sensitivity mammalian habitats.		Shared MA 9		
	If structures (i.e. overpasses and/or causeways) are required to cross streams, either minimize in-stream supporting structures or construct culverts to allow flow and minimize impact.	EIA 12.9.3	Area 4 SW 22 Shared SW 19		
	Where roads and fences cross High sensitivity mammalian habitats, allow unhindered passage of mammals to the extent practical, subject to security constraints and requirements.		Shared MA 10		
	Access roads established in areas linking sensitive habitats (eg wetlands) will have culverts or underpasses to permit medium-size predators and small ungulates to pass unhindered.	EIA 12.13.4	Shared MA 16		
	Design and construct culverts under roads for use as underpasses by herpetofauna. Culverts to be located close to drainage channels and wetlands to the extent practical.	EIA 12.11.3	Area 4 HE 10 Shared HE 10		
	Control potential scouring at road culvert outlets by installing energy dissipation devices, such as rock mattresses or gabions, where required.			A	
	Provide access for pedestrians and vehicles in areas where pedestrians and project vehicles mix.			A	
<b>Execution Requirements</b>					



<b>Vehicle movements</b>	In the event that sea transport of aggregate and gravel is not feasible, a Method Statement and transportation safety analysis will be conducted for the road transport of raw materials.	EIA 4.4.5	Area 4 GE 2 Shared GE 1		
	Construction and operations vehicles should remain on roads and designated working areas.	EIA 12.6.3	Area 4 SO 10 Shared SO 10 LNGMT SO 10 MOF SO 10		
	Limit the movement of employees and contractors to within Project-defined areas, using designated transport (ie no walking outside the Onshore Project Footprint) and transportation routes (ie designated Project roads).	EIA 13.4.4	Area 4 SE 23		
	Optimisation of transport logistics (eg equipment, products and people) and the use of energy-efficient vehicles and machinery and maintain them in good working condition to reduce fuel consumption.	EIA 12.3.2	Area 4 AQ 3 Shared AQ 1 LNGMT AQ 1 MOF AQ 1		
	Implement a convoy system for vehicles with significant loads when travelling through communities as deemed required on a risk-based approach.			A	



	Enforce speed restrictions on all roads to minimise environmental and social impacts.	EIA 12.11.3 EIA 12.12.3 EIA 12.13.3	Area 4 HE 15, AV 6, MA 10,12 Shared HE 14, AV 6, MA 11,13 LNGMT AV 6 MOF AV 6		
	Deploy trained and competent traffic control persons as flag persons, and implement other appropriate traffic control measures at traffic hot spots (intersections, blind corners, built-up areas, etc).			A	
	Avoid night driving to the extent possible and, when necessary, implement reduced speeds for night driving.	EIA 12.13.3	Area 4 MA 13 Shared MA 14		
<b>Vehicle maintenanc e and inspection</b>	Construction and operations vehicles and equipment will be serviced and maintained regularly to prevent incidental leaks.	EIA 12.6.3 EIA 12.9.4	Area 4 SO 9 Shared SO 9 LNGMT SO 9 MOF SO 9		
	Vehicles, vessels and equipment working onshore near the estuaries or in the near shore will be serviced regularly.		Area 4 SW 32 Shared SW 29 LNGMT SW 19 MOF SW 19		

	Conduct pre-trip vehicle inspections.			A	
	Install speed tracking systems in all site-based project vehicles.			A	
	Adequate dust control strategies will be applied to minimise dust deposition and reduce sedimentation in the wetland systems, for example: - periodic spraying of roads with water or dust inhibitor; - covering transport trucks hauling materials that have the potential to become airborne, to prevent dust emission during transport.	EIA 12.9.5	Area 4 SW 41 Shared SW 40 LNGMT SW 29 MOF SW 29		
	Adequate dust control strategies will be applied to minimise dust deposition generated from Project traffic and road transport activities at sensitive receptors (where communities or work personnel may be impacted on), including covering of transport trucks hauling materials that have the potential to become airborne and periodic spraying of roads with water or dust inhibitor, where reasonably practicable.			A	
<b>Security of vehicles</b>	Establish security procedures and secure project vehicles and equipment to prevent unauthorized access to and use of vehicles at worksites, inside camps and laydown areas and at any 'outside the fence' areas where vehicles may be parked or left while not in use.			A	
<b>Driver behaviour and qualification</b>	Proposed occupational health and safety mitigations will be outlined in an Occupational Health and Safety Management Plan, and will include: 1. managing mobile equipment and machinery, which will include assessment of their fitness to work as drivers, supported by specific medical surveillance programmes; 2. strictly enforcing drug and alcohol policies for all work-related vehicles, including contractor transport vehicles; 3. employee and contractor management for Project transport vehicles. These need to include specific requirements for driver training, rest periods, vehicle roadworthiness, speeding, etc.	EIA 13.5.6	Area 4 SE 61,62,63,6 4		



	Develop and implement driver competency requirements, and ensure that all personnel who will, or may, drive have demonstrated compliance with the competency requirements. Records to be kept, including evidence of valid driver's licence, and any other competency required for the driving task at hand.			A	
	Establish and monitor driver hours and conditions of work to avoid driver fatigue.			A	
	Develop and implement code of conduct for drivers covering expected driving behaviours towards the local community; Monitor adherence and enforce strict consequences for breaches.			A	
	Include procedures and rules that help avoid unnecessary rapid acceleration, breaking, revving or engines and use of horns (e.g. as round-up).			A	
<b>Training</b>	Provide training to drivers regarding procedures to follow in the event of a collision. A logbook will be placed in each vehicle to record mammal deaths and injuries.	EIA 12.13.3	Area 4 MA 11 Shared MA 12		
	Conduct traffic safety awareness training and community engagement programs in communities along the roads that project vehicles drive to inform and educate communities on Project traffic and transport activities, road safety, and traffic conditions.			A	
<b>Incident response</b>	Maintain an emergency response capability to provide emergency assistance for drivers and third parties involved in project related traffic incidents.			A	
<b>Stakeholder Engagement</b>	Engage with relevant stakeholders on traffic and transport prior to starting activities in line with Company Stakeholder Engagement Plan.			A	
	Agree road maintenance requirements, signage, pedestrian crossings, speed bumps, barriers, and other control measures (including monitoring speed limits) on public roads with authorities and local law enforcement.			A	
	Engage with relevant authorities regarding road maintenance plans in line with Company Stakeholder Engagement Plan.			A	

	Prohibit non-work related travel by personnel along public roads.			A	
<b>Monitoring</b>	Implement a monitoring programme to identify areas of high animal populations along particular road alignments, and implement appropriate precautionary behaviour in these areas (e.g. reduce speed).	EIA 12.13.3	Shared MA 15		
<b>Roads reinstatement</b>	Contractor will be solely responsible for maintenance of any road used exclusively or predominantly by the Contractor. Contractor will be responsible for repairing any significant damage (i.e. that necessitates immediate repair) it causes itself on any road, regardless of usage of other parties. Evaluate routine wear and tear and determine extent of necessary maintenance and repairs on shared or non-public roads for reporting to Company every 6 months. (Contractor may be requested to maintain/repair the relevant roads through the provisional sum basis, regardless of whether 3 <sup>rd</sup> parties utilize the roads in question).			A	

### 2.3. Requirements for Additional Land

Where new land is required for the construction of new access roads, the Contractor shall follow the agreed Protocol for Additional Land in order to gain access to that land.

### 2.4. Pre-Construction Surveys

Contractor shall carry out the pre-construction surveys outlined in Table 2-4 as well as any other pre-construction survey requirements identified through the impact assessment process.

**Table 2-4: Pre-Construction Surveys**

No	Specific Requirements	Responsibility	Deliverable
1	Road condition (photo/video) of all roads which will have frequent passage of project vehicles.	Contractor	Pre-construction road condition survey report including methodology and results.
2	Photo / video all houses / buildings which could be directly impacted or damaged due to passage of Project vehicles; photos / videos should be sufficiently detailed to be able to be used to respond to claims relating to damage due to vibration from passing Project traffic (e.g., cracks to walls).	Contractor	Pre-construction building condition survey report including methodology and results.
3	Identification and field marking of all trees or other flora or important cultural heritage to be protected during road upgrades or new roads.	Contractor	Constraints map and photo evidence of field marking.



### 3. DELIVERABLES

The following deliverables are associated with Road Traffic and Transport. Contractor deliverables shall be submitted to the Company for Company approval.

**Table 3-1: Summary of Deliverables**

Section Reference	Deliverable	Responsibility	Deliverable Date
<b>STAGE 1</b>			
Table 2-1	Baseline report (if required)	Contractor	To be agreed on contract award
Table 2-1	Topic-specific Alternatives Analysis Report, which as a minimum includes: <ol style="list-style-type: none"> <li>1) Overview of E&amp;S baseline relevant to the options assessment screening</li> <li>2) Alternatives analysis review, including details of E&amp;S risks and impacts evaluation, as well as other relevant drivers for the decision-making process</li> <li>3) Final recommendation on the Project base case.</li> </ol>	Company	To be advised on contract award
<b>STAGE 2</b>			
Table 2-2	Topic-specific E&S Report, which as a minimum includes: <ol style="list-style-type: none"> <li>1) Definition of the approved Project base case</li> <li>2) Updated/refined baseline description, as applicable to the base case</li> <li>3) Updated E&amp;S risks and impacts evaluations</li> <li>4) Refined list of E&amp;S control measures.</li> </ol>	Contractor	To be agreed on contract award
<b>STAGE 3</b>			
Section 2.3	Additional Land Use Protocol	Company	To be provided prior to contract award
Section 2.3	Description of land needs	Contractor	As required



<b>Section Reference</b>	<b>Deliverable</b>	<b>Responsibility</b>	<b>Deliverable Date</b>
Section 2.2	Topic-Specific CIP, which as a minimum includes: 1) Approved list of E&S control measures 2) Details of how the approved control measures will be implemented (including linkage to other Project plans and procedures, where necessary, to demonstrate the implementation of the E&S controls committed to) 3) Details of the monitoring, reporting and assessment.	Contractor	To be agreed on contract award
Table 2-4	Pre-construction road condition survey report including methodology and results	Contractor	To be agreed on contract award
Table 2-4	Pre-construction building condition survey report including methodology and results	Contractor	To be agreed on contract award
Table 2-4	Constraints map and photo evidence of field marking	Contractor	To be agreed on contract award