



**Rovuma**  
**LNG**

**ENVIRONMENTAL AND SOCIAL  
REQUIREMENTS FOR CONTRACTORS:  
ANNEX 13 – WEED AND PEST MANAGEMENT**

**ROVUMA LNG PROJECT**

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

## TABLE OF CONTENTS

<b>1. PURPOSE AND SCOPE.....</b>	<b>3</b>
1.1. Objectives.....	3
1.2. Scope .....	3
1.3. Linkage to Other Contractor Requirements.....	3
1.4. Background Context .....	4
1.5. E&S Risks and Potential Impacts.....	4
<b>2. REQUIREMENTS .....</b>	<b>5</b>
2.1. E&S Assessment and Evaluation and CIP Development .....	5
2.2. E&S Control Measures .....	5
2.3. Pre-Construction Surveys.....	13
<b>3. DELIVERABLES.....</b>	<b>14</b>

## LIST OF TABLES

<b>Table 1-1: A Guide to Activities, Consequences, Risks and Potential Impacts.....</b>	<b>4</b>
<b>Table 2-1: E&amp;S Control Measures .....</b>	<b>6</b>
<b>Table 2-2: Pre-Construction Surveys.....</b>	<b>13</b>
<b>Table 3-1: Summary of Deliverables.....</b>	<b>14</b>

 <b>Rovuma LNG</b>	<b>Environmental and Social Requirements for Contractors: Annex 13 – Weed and Pest Management</b>	<b>MZLN-EL-RBENV-00-0001</b> <b>Revision: 1</b> <b>Date: 9/05/2019</b>
		<b>Page 3 of 14</b>

## 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 Weed and Pest Management.

### 1.2. Scope

For the purposes of this document, Weed and Pest Management encompasses the following activities: weed and pest identification; risk assessment (specifically with respect to invasive species); implementation of weed and pest control measures; selection and procurement of pesticides; storage, handling and application of pesticides; quarantine measures; sourcing of vehicles and equipment; shipping and transport; and worker behaviour. The scope excludes requirements relating to marine-based invasive species which are associated with ballast water and biofouling, as these are covered in the Ballast Water and Biofouling document. It also does not cover specific requirements pertaining to hazardous materials, as these are also covered in a dedicated 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 Hazardous Materials Annex; Ballast Water and Biofouling Annex; Site Development, Construction and Reinstatement Annex; and Raw Materials and Aggregates Annex.



#### 1.4. Background Context

The Project is committed to preventing exotic weeds, plant pathogens and pests from entering, spreading or becoming established in the project area during construction, where an exotic weed or pest is defined as a native or introduced species that causes, or has the potential to cause, an adverse impact on the areas' ecology and / or communities (including their livelihoods) located in the vicinity of the plant site. Not all exotic species are invasive.

While this document only outlines the E&S requirements surrounding terrestrial weed and pest species, with potential marine risks and impacts being managed according to the requirements described elsewhere (Section 1.2), it is assumed that an integrated approach will be adopted, for example in relation to training and awareness; the screening and fumigation of goods and materials arriving from international sources such as marine vessels, lorries, and aircraft; the procurement, storage and use of pesticides and herbicides; reporting; and monitoring.

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

Table 1-1 outlines the E&S risks and potential impacts identified to date associated with Weed and Pest Management. 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 2-1).

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

ACTIVITY	POTENTIAL CONSEQUENCE	RISKS AND POTENTIAL IMPACTS
Import of plant-based material (soil, seeds)	Accidental introduction of exotic plants or animals	Detrimental impact on natural habitat and populations of indigenous plant and animal species (NR3)
		Livelihood impacts on agriculture (LH1)
Import of machinery contaminated with foreign soil	Accidental introduction of exotic plants or animals	Detrimental impact on natural habitat and populations of indigenous plant and animal species (NR3)
		Livelihood impacts on agriculture (LH1)
Import of materials in containers / on ships	Accidental introduction of exotic plants or animals	Detrimental impact on natural habitat and populations of indigenous plant and animal species (NR3)
		Livelihood impacts on agriculture (LH1)
		Contravention of international conventions (O1)
Removal or control of weeds and / or pest using herbicides or pesticides	Chemical residues and spills	Detrimental impact on natural habitat and populations of indigenous plant and animal species (NR3)
		Degradation or destruction of natural seed bank and soil quality (P10)
		Worker health (LAB4)
		Detrimental impact on community health (C2)
	Accidental poisoning of wildlife	Degradation or destruction of natural seed bank and soil quality (P10)
	Contamination of surface and groundwater (P5)	

 <b>Rovuma LNG</b>	<b>Environmental and Social Requirements for Contractors: Annex 13 – Weed and Pest Management</b>	<b>MZLN-EL-RBENV-00-0001</b> <b>Revision: 1</b> <b>Date: 9/05/2019</b>
		<b>Page 5 of 14</b>

## 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 Weed and Pest Management, only stage 3 is required.

#### 2.1.1. Stage 3 – Contractor Implementation Plan

The Contractor shall develop a CIP which outlines how they propose to implement the control measures in the Table 2-1 (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.

### 2.2. E&S Control Measures

The control measures in Table 2-1 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 2-1: E&S Control Measures**

ACTIVITY / SOURCE OF POTENTIAL IMPACT	CONTROL MEASURE	IMPACT / RISK BEING ADDRESSED	SOURCE			Notes
			EIA	EMP	Other	
<b>Overarching Requirements</b>						
General	Prioritise the prevention of exotic weeds, plant pathogens and pests from entering the site, followed by early detection and, where reasonably practicable, eradication.				A	
	Application of approved pesticides and herbicides should only be used as a last resort when other measures such as, in the case of exotic weeds, mechanical slashing, mulching, removal, disposal, are not effective or reasonably practicable on their own.				A	
	Take necessary measures to avoid health risks to workers and communities resulting from the procurement, storage, handling, application and disposal of pesticides and herbicides.				A	
	There shall be no purchase, storage, use, manufacture or trade in WHO Recommended Classification of Pesticides by Hazardous Class II (moderately hazardous) pesticides, unless the project has appropriate controls on manufacture, procurement or distribution and/or use of these chemicals.	O1, P9			A	
	There shall be no purchase, storage, use, manufacture or trade in products that fall in the WHO Recommended Classification of Pesticides by Hazardous Class Ia (extremely hazardous); or Ib (highly hazardous).	O1, P9			A	
	Establish and enforce a project-wide risk-based invasive species management program, including prevention and control measures at the point-of-origin and on-site treatment.	NR1, NR2, NR3, NR12			A	

ACTIVITY / SOURCE OF POTENTIAL IMPACT	CONTROL MEASURE	IMPACT / RISK BEING ADDRESSED	SOURCE			Notes
			EIA	EMP	Other	
	Evaluate chemicals for environmental, safety and technical performance prior to procurement. As far as practical, least hazardous chemicals will be selected.	P10, P5, P4, O1, P9	EIA 14.3.7	Area 4 UE 5 Shared UE 1 LNGMT UE 5,18 MOF UE 5,18		
	A risk assessment shall be undertaken for pesticides and herbicides used in significant quantities	P10, P5, P4, O1, P9			A	
	All contractors, subcontractors and suppliers to be aware of and comply with the invasive species management requirements of the Ministério da Agricultura and any other relevant Mozambican regulatory requirements.				A	
<b>Execution Requirements</b>						
<b>Weeds and Invasive Species Management</b>						
Point of Origin Controls	All plant, materials, vehicles, hardware and tools etc. shall be cleaned in accordance with the requirements of IFC PS6 and ensure that there is no evidence of soil, animal or plant material on the equipment prior to being delivered to site.				A	
	Suppliers shall inspect cargo, containers and break-bulk cargo 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.				A	
	Prohibited packaging materials shall not be used. This includes used sacking, moss, sawdust, grass bales and/or bark which present a high risk of introducing exotic species.				A	
	All timber packaging to be treated and stamped in line with the International Standards for Phytosanitary Measures No 15 (ISPM15).				A	

ACTIVITY / SOURCE OF POTENTIAL IMPACT	CONTROL MEASURE	IMPACT / RISK BEING ADDRESSED	SOURCE			Notes	
			EIA	EMP	Other		
	Documentation is to be kept to demonstrate the inspection, treatment and management of invasive species measures, and made available for Company inspection as requested.				A		
Project Site Controls	Design, construct and operate vehicle wash-down facilities for all earth-moving equipment and vehicles travelling from outside Palma District, unless a visual inspection of that equipment/vehicle is carried out and there is no considerable mud or vegetative debris evident on the wheels and/ or undercarriage, in which case wash-down would not be required. Ensure wash-down occurs on an impermeable area, contain and treat the wash-down water as necessary, and prevent runoff from entering the natural environment.			Area 4 VE 12 LNGMT VE 12 MOF VE 12 Shared VE 12			
	Establishment of on-site Project gardens, shall be restricted to native species.				A		
	Prohibit transportation to site of live animals (with the exception of security dogs), or plants or seeds (with the exception of native species utilised for Project-established gardens).					A	
	Contractor is to develop and execute a risk-based inspection program for containers, equipment, etc. on arrival to site in line with the Contractor's invasive species management program. Company may inspect the implementation of this program.					A	
Monitoring	A Company-approved monitoring programme is to be implemented to control alien/invasive plant species within areas under Project control, with special attention given to devil's weed, castor oil bush, horsetail tree and sisal. A qualified botanist should be contracted to oversee site surveys for non-native floral species, as part of this programme.	NR3, NR12	EIA 12.10.3	Area 4 VE 10 Shared VE 10, BP 13 LNGMT VE 10 MOF VE 10			

ACTIVITY / SOURCE OF POTENTIAL IMPACT	CONTROL MEASURE	IMPACT / RISK BEING ADDRESSED	SOURCE			Notes
			EIA	EMP	Other	
Incident Management	In the event of on-site invasive species detection in imported material or containers, Company is to be notified, the containers/items shall be segregated and stored (sealed if appropriate) on impermeable ground, and appropriate control measures implemented (such as fumigation, incineration).				A	
	In the event of on-site invasive species identification / establishment or spread, these will be managed on a case-by-case basis to identify the most appropriate course of action of control and/or eradication taking into account the species invasive potential and associated risks and impacts (including of the controls, such as chemical controls).			Area 4 VE 11 LNGMT VE 11 MOF VE 11 Shared VE 11		
Awareness and training	Include invasive species awareness training for project personnel (including as part of the site induction), including information on how to identify, report and manage invasive species which may be encountered on site (e.g., castor oil bush).	NR1, NR2, NR3, NR12			A	
<b>Pests</b>						
Planning and procedures	Procedures will be implemented for pest management that target economically significant pest infestations and those that pose a significant impact to human health and local ecology, including agriculture. The primary strategy shall be to maintain a clean and tidy worksite and accommodation facilities so as not to attract pests.	NR3, LAB4			A	
	The pest management system will integrate coordinated use of pest and environmental information along with available pest control methods including cultural practices, biological, genetic, and, as a last resort, chemical means to prevent economically significant pest damage and/or disease transmission to humans and animals.	NR3, P10, P5, LAB4			A	

ACTIVITY / SOURCE OF POTENTIAL IMPACT	CONTROL MEASURE	IMPACT / RISK BEING ADDRESSED	SOURCE			Notes
			EIA	EMP	Other	
Selection and procurement	Where chemicals are used for pest control, the procedures will follow the chemical procurement and selection requirements detailed in a Hazardous Materials Requirements document and will have a low human toxicity level and will be known to be effective against the target species. Chemicals will be selected that have a minimal effect on non-target species.	NR3, LAB4, C2			A	
	Any pesticides used are to be in compliance with Mozambican regulations and requirements, including any applicable licensing requirements.	NR3, LAB4, C2			A	
Storage and handling	Ensure pesticide storage, handling and application methods, including safety consideration, are in line with Project Standards and Good International Industry Practice.	NR3, P10, P5, O1			A	
	Storage, handling, application and disposal of pesticides will be in accordance with the Food and Agriculture Organization's International Code of Conduct on the Distribution and Use of Pesticides.	NR3, P10, P5, O1			A	
	Safety Data Sheet for each pesticide shall be kept alongside the storage containers.	LAB4			A	
	Pesticides will be packaged in safe containers, be clearly labelled for safe and proper use.	NR3, P10, P5, LAB4			A	
	Only personnel that have received the appropriate training shall handle pesticides. Such personnel will be equipped with the appropriate equipment and facilities to handle, store, apply and dispose of these products properly.	NR3, P10, P5, LAB4			A	
	Pesticides will always be inaccessible to unauthorized and untrained personnel.	LAB4			A	

ACTIVITY / SOURCE OF POTENTIAL IMPACT	CONTROL MEASURE	IMPACT / RISK BEING ADDRESSED	SOURCE			Notes
			EIA	EMP	Other	
Application and management	Design pesticide application strategy to:	NR3, P10, P5,			A	
	<ul style="list-style-type: none"> <li>Have a minimal effect on non-target species e.g., native small mammal population and / or rodent predators (e.g., raptors and other predators);</li> </ul>					
	<ul style="list-style-type: none"> <li>Avoid or minimize damage to natural enemies of the target pest.</li> </ul>					
	<ul style="list-style-type: none"> <li>Avoid or minimize the risk associated with the development of resistance in pests and vectors.</li> </ul>					
	Avoid damage to natural enemies of the target pest and where avoidance is not reasonably practicable, aim to minimize the damage.	NR3			A	
	Avoid the risk associated with the development of resistance in pests and vectors and where avoidance is not reasonably practicable, aim to minimize development of resistance.	NR3			A	
	Noxious insects and vermin such as ants, bees, wasps, spiders, scorpions, rats and cockroaches which pose a risk to health and safety shall be controlled by the Contractor by fumigation at camps and other work areas with chemicals approved by the Company.	NR3			A	
	Not all rodents will be considered vermin. Rodents that form a component of the natural faunal diversity will be afforded the same level of protection as other fauna.	NR3			A	
	Implement the following rodent control measures: <ul style="list-style-type: none"> <li>Establish appropriate management protocols for food and human refuse.</li> <li>Establish quality controls for deliveries to avoid pests in transit.</li> </ul>			Area 4 MA 20 Area 4 MA 21 Area 4 MA 22		

ACTIVITY / SOURCE OF POTENTIAL IMPACT	CONTROL MEASURE	IMPACT / RISK BEING ADDRESSED	SOURCE			Notes
			EIA	EMP	Other	
	<ul style="list-style-type: none"> <li>Employ early eradication steps at the outset of camp establishment.</li> <li>Rodent poison controls will be strictly monitored to avoid spread to the native small mammal population and/or cause the accidental mortalities of rodent predators such as raptors, owls and other small and medium-size predators.</li> </ul>			Area 4 MA 23  Area 4 MA 24		
	Snakes will not be considered vermin and will also be afforded the same level of protection as other fauna.	NR3			A	
	Use biological, genetic, and as a last resort, chemical means to prevent pest damage and / or disease transmission to humans and animals and give consideration to environmental sensitivities, cultural practices.	NR3, P10, P5			A	
	Only use herbicides for the eradication of a weed where this is the most effective form of control.	NR3, P10, P5			A	
Monitoring and Inspection	Rodent poisons, if used, will be strictly monitored to avoid spread to the native small mammal population and/or cause the accidental mortalities of rodent predators such as raptors, owls and other small to medium size predators.	NR3			A	

### 2.3. Pre-Construction Surveys

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

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

NO	SPECIFIC REQUIREMENTS	RESPONSIBILITY	DELIVERABLE
1	Record and photograph the presence and distribution of exotic weeds within the works area, buffer zones and adjacent areas of natural habitat, including areas designated as Critical Habitat	Contractor	Pre-construction exotic species condition survey <ul style="list-style-type: none"> <li>• Methodology</li> <li>• Report (including a map showing presence and abundance)</li> </ul>

### 3. DELIVERABLES

The following deliverables are associated with Weed and Pest Management. 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 3</b>			
Section 2.1.1	Topic-Specific CIP, which as a minimum includes: <ol style="list-style-type: none"> <li>1) Approved list of E&amp;S control measures</li> <li>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&amp;S controls committed to)</li> <li>3) Details of the monitoring, reporting and assessment.</li> </ol>	Contractor	To be agreed on contract award
Table 2-2	Pre-construction invasive species survey report including methodology and constraints map	Contractor	To be agreed on contract award