

Esso Highlands Limited



Papua New Guinea LNG Project

**Environmental and Social Management Plan
Appendix 11: Reinstatement Management Plan**

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1.0 OBJECTIVES

Esso Highlands Limited (Company) has developed this Reinstatement Plan as part of its Environmental and Social Management Plan (ESMP).

The objectives of the Reinstatement Management Plan are to:

1. Establish stable landform conditions in areas disturbed as a result of construction activities
2. Create ground conditions conducive to natural regeneration.

The Reinstatement Management Plan should be read in conjunction with other Company plans:

- Ecological Management Plan
- Water Management Plan
- Weed Plant Pathogen and Pest Plan
- Erosion and Sediment Control Plan.

2.0 LEGAL AND OTHER REQUIREMENTS

Legal and other requirements applicable to this plan are identified in Attachment 1.

3.0 SURVEYS

Contractor shall identify, prior to construction, all areas requiring active reinstatement to enable the development of site specific reinstatement plans.

4.0 MANAGEMENT AND MONITORING

Table 1 presents a summary of mitigation and management measures for reinstatement activities associated with construction activities.

In Table 1, any mitigation and management commitments that were contained in the PNG LNG Project Environmental Impact Statement (EIS) are identified by a code commencing with an 'M' in the 'Mitigation Item Reference Number' column. Some mitigation measures have been reworded to provide further clarity or more detailed information regarding required measures. In these instances, the code is displayed in italics, and these reworded measures supersede what is in the EIS.

Other mitigation and management commitments required by Company are identified in Table 1 with a code commencing with an 'A'.

Contractor shall develop a Reinstatement Management Plan which will as a minimum incorporate the management and mitigation measures also described in Table 1 but shall not be limited to these measures.

Due to differing scopes of work and work locations, not all management and mitigation measures in the Reinstatement Management Plan are applicable to all Contractors. Company's Environmental and Social Mitigation Register defines which management and mitigation measures are applicable to each Contract scope of work.

Monitoring activities associated with reinstatement and expected during the maintenance period are covered in the Water Management Plan and Erosion and Sediment Control Management Plan.

Visual assessment is required to evaluate the extent of vegetation regrowth.

Table 1: Management and Monitoring

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Source of Impact	Potential Impact and Relevant Management Plan Objective[†]	Mitigation and Management (Design Feature/Specific Measure)	Mitigation Item Reference Number	Monitoring	Monitoring Frequency	Responsibility
Unstable landform	Erosion and mass soil movement posing increased risk to pipeline integrity and offsite sedimentation (Objectives 1, 2)	Where practicable, disturbed areas will be returned to former landforms and vegetation of exposed areas will occur as soon as practicable once construction activities are completed in any particular location. Areas prone to erosion will receive particular attention.	M18	Verification	Ongoing	Contractor
		Develop site-specific reinstatement plans based on land systems or equivalent and address ground preparation activities, interim and permanent soil erosion and sediment management issues, and approaches to revegetation (natural regeneration versus intervention).	M11	N/A	N/A	Contractor
		(LNG Plant Site) Where practicable strip and salvage topsoil. Where salvaged, protect topsoil from loss or degradation. Use topsoil in reclamation management plan.	M12	Verification	Ongoing	Contractor
		Reduce the period surfaces are exposed, and reinstate areas no longer required for construction or support services. Provide particular attention to areas prone to erosion.	M7	Verification	Ongoing	Contractor
		Limit work vehicles and machinery to designated access and work site areas.	M10	Verification	Ongoing	Contractor
		Undertake site reinstatement promptly and progressively as works are staged and as soon as possible after disturbance, taking into account the nature of subsequent project activities that will be undertaken at the same sites as well as agreed end uses.	M75	N/A	N/A	Contractor
		Where practicable, stockpile cleared vegetation in a manner that facilitates respreading or salvaging, e.g., place on one side of cleared areas.	A	Verification	Ongoing	Contractor
		Where practicable, utilize land-clearing techniques that preserve the rootstock of removed vegetation in the ground.	M74	Verification	Ongoing	Contractor

Table 1: Management and Monitoring						
Source of Impact	Potential Impact and Relevant Management Plan Objective [†]	Mitigation and Management (Design Feature/Specific Measure)	Mitigation Item Reference Number	Monitoring	Monitoring Frequency	Responsibility
		Remove or reuse waste materials from reinstated areas.	A83	Verification	Ongoing	Contractor
		Commence stream bank reinstatement as soon as in-stream construction work is completed, where practicable.	A84	Verification	Ongoing	Contractor
		Reinstate watercourses to Company approval.	A85	Verification	Prior to backfill	Contractor
		When reinstating watercourses, replace stockpiled stream bed rocks, pebbles and/or coarse gravel and reinstate watercourse banks to stabilize and facilitate bio-restoration.	A86	Verification	Ongoing	Contractor
		De-compact disturbed areas, where required.	A87	Verification	After backfill	Contractor
		Where appropriate, undertake active works to re-establish vegetation in areas that may be slow or difficult to regenerate naturally, difficult to stabilise or prone to erosion.	M119	Verification	Ongoing	Contractor
		Where practicable, soil, mulch and discarded vegetation debris (including natural seed stock) will be spread on reclaimed or rehabilitated disturbed land surfaces to facilitate natural revegetation.	M121	Verification	After backfill	Contractor
		Where practicable, topsoil will be conserved in designated topsoil stockpile areas at facility construction sites for later reuse.	M122	Verification	Ongoing	Contractor
		Salvage topsoil for rehabilitation of slopes, where practicable.	M123	Verification	Ongoing	Contractor
		Where salvaged, reduce damage to topsoil and mulch with sterile medium to protect seed resource.	M124	Verification	Ongoing	Contractor
		Remove trees, debris or soil inadvertently deposited below the high water mark of watercourses where safe to do so and, where practicable, in a manner that reduces disturbance of the bed and banks. Use material for reinstatement.	M138	Verification	Ongoing	Contractor

Table 1: Management and Monitoring						
Source of Impact	Potential Impact and Relevant Management Plan Objective[†]	Mitigation and Management (Design Feature/Specific Measure)	Mitigation Item Reference Number	Monitoring	Monitoring Frequency	Responsibility
		Where practical, stabilise cleared banks to facilitate reinstatement.	M139	Verification	Prior to backfill	Contractor
		Implement industry good practice erosion and sediment control measures at watercourse crossings, as necessary.	M155	Verification	Ongoing	Contractor
		Monitor and maintain erosion control structures until adequate slope stabilization, sediment control and subsidence control has been achieved.				
		Monitor erosion at reclaimed watercourse crossings and remediate as necessary.				
		Install diversion drains to intercept uncontaminated surface runoff around facilities and away from construction areas, where necessary.				
		Install sediment control structures to intercept sediment-laden surface runoff to reduce sediment delivery to watercourses.				
		Prohibit deposition of sidecasting material directly into waterways where practicable.				
		Design culverts to accommodate design flows and mitigate sedimentation and debris.				
		Avoid stockpiling spoil and/or topsoil materials close to waterways (i.e., maintaining approximately 10 m from waterline), where practicable.				

Table 1: Management and Monitoring						
Source of Impact	Potential Impact and Relevant Management Plan Objective [†]	Mitigation and Management (Design Feature/Specific Measure)	Mitigation Item Reference Number	Monitoring	Monitoring Frequency	Responsibility
		Implement sediment control measures downstream of sidecast material where safe and practicable.				
		Monitor and maintain sediment control structures until adequate slope stabilization, sediment control and subsidence control has been achieved.				
		Control sediment runoff from stockpiles and cleared areas around watercourses, where practicable.				
		Grade Row and access way alignments adjacent to streams away from watercourses.				
		Install specific soil stabilisation measures on side hill cuts to prevent slumping and/or erosion.	A88	Verification	After cut	Contractor
		Stabilise exposed areas susceptible to wind erosion, using measures such as water, agglomerating agents, and temporary grass/hydromulch where appropriate.	M45	Verification	After backfill	Contractor
		The construction and reinstatement of the RoW in the Omati River swamp area will be managed to maintain natural hydrologic flows and connectivity in the surrounding area. Monitoring of vegetation condition in the vicinity of the RoW will be conducted to assess the need for post construction remedial works in this area.	M162	Verification	Ongoing	Contractor and Company
		Close and reinstate Company quarries (in accordance with Mitigation A90 & A91) in a timely manner to an appropriate, stable land use state agreed by Company.	A89	Verification	Following quarry use	Contractor
		Upon decommissioning of temporary Company quarries and borrow pits used for construction, reinstate quarry/borrow pit access routes to prevent further use.	A90	Verification	Following quarry use	Contractor

Table 1: Management and Monitoring						
Source of Impact	Potential Impact and Relevant Management Plan Objective[†]	Mitigation and Management (Design Feature/Specific Measure)	Mitigation Item Reference Number	Monitoring	Monitoring Frequency	Responsibility
		Upon decommissioning of temporary Company quarries and borrow pits used for construction, rip base of quarry/borrow pit to enable seed penetration and promote natural succession.	A91	Verification	Following quarry use	Contractor

[†] See Section 1.

5.0 ROLES AND RESPONSIBILITIES

Contractor shall ensure sufficient resources are allocated on an ongoing basis to achieve effective implementation of the Reinstatement Management Plan.

Contractor's Reinstatement Management Plan shall describe the resources allocated to and responsible for the execution of each task and requirement contained therein, and shall describe how roles and responsibilities are communicated to relevant personnel.

Company shall ensure sufficient resources are allocated on an ongoing basis to achieve effective implementation of Company's responsibilities in the Reinstatement Management Plan.

6.0 TRAINING, AWARENESS AND COMPETENCY

Contractor shall ensure that all personnel responsible for the execution of the tasks and requirements contained within the Reinstatement Management Plan are competent on the basis of education, training and experience.

Contractor's Reinstatement Management Plan shall describe the training and awareness requirements necessary for its effective implementation.

Contractor's training activity associated with the Reinstatement Management Plan shall be appropriately documented by means of a training needs assessment, training matrix/plan and records of training undertaken.

Company shall ensure that all Company personnel responsible for the execution of Company's tasks and requirements in the Reinstatement Management Plan are competent on the basis of education, training and experience.

Company's training activity associated with the Reinstatement Management Plan shall be appropriately documented by means of a training needs assessment, training matrix/plan and records of training undertaken.

7.0 PERFORMANCE INDICATORS

Table 2 outlines indicators for measuring and verifying performance in relation to this Reinstatement Management Plan.

Table 2: Performance Indicators

ID #	Performance Indicator	Measurement	Internal Assessment Frequency	Relevant Management Plan Objective [†]
1	Landform stability	Occurrence of mass failings sedimentation	Quarterly	1
2	Vegetation regeneration	Vegetation cover	Quarterly	2
Performance Indicators to be further developed and agreed between Contractor and Company				

[†] See Section 1

8.0 REPORTING AND NOTIFICATION

Contractor shall report to Company the results of the surveys and assessments required pursuant to Section 3.0, and integrate the results, including additional mitigation and management measures as agreed with Company, with the Reinstatement Management Plan and site specific reinstatement plans.

Contractor's monthly report to Company shall include:

- Results of the surveys and assessments prescribed in Section 3
- Number and results of verification inspections prescribed in Table 1
- Performance Indicators as applicable in the reporting period.

Attachment 1: Legal and Other Requirements

LEGAL AND OTHER REQUIREMENTS

Contractor shall comply with applicable Papua New Guinea Laws and Regulations, applicable International Finance Institution (IFI) requirements and International Treaties and Conventions (where applicable).

Papua New Guinea Laws and Regulations

The Environment Act 2000 contains numerous provisions that promote environmental protection, regulate environmental impacts associated with development activities, and safeguard the life supporting capacity of air, water land and ecosystems. None are directly related to reinstatement *per se*.

International Financial Institution Requirements

The following International Finance Corporation (IFC) Performance Standards apply to reinstatement:

- IFC Performance Standard 6: *Biodiversity Conservation and Sustainable Natural Resources Management* is relevant due to the over-riding objectives of protecting and conserving biodiversity, and promoting sustainable management and use of natural resources. The Performance Standard specifies the need for post-operation restoration of habitats and the adoption of measures to prevent accidental or unintended introductions of alien species.
- IFC Performance Standard 3: *Pollution Prevention and Abatement*

Successful reinstatement is an effective mitigation measure and is therefore consistent with the objectives of pollution prevention and abatement:

“The objectives of pollution prevention are to avoid or minimize adverse impacts on human health and the environment by avoiding or minimizing pollution from project activities”

- IFC Performance Standard 4: *Community Health, Safety and Security*, which requires Projects to avoid or minimize adverse impacts due to Project activities on soil, water, and other natural resources in use by affected communities.

The following IFC Guidelines apply to reinstatement. Contractor shall meet the intent of these guidelines:

- IFC EHS *General Guidelines* (April 2007), Sections 1.3, 1.4, 3.1 and 4.1

In addition to provisions relating to ambient water quality (Section 1.3), water conservation (Section 1.4) and water quality and availability (Section 3.1), all of which could be adversely affected by poor or ineffective reinstatement, this Guideline also contains specific provisions with respect to soil erosion and specifically the need to reduce or prevent erosion and off-site sediment transport through appropriate reinstatement, including:

- Contouring and minimizing length and steepness of slopes
- Mulching to stabilize exposed areas
- Re-vegetating areas promptly
- Designing channels and ditches for post-construction flows
- Lining steep channel and slopes (e.g. use jute matting)

- Reducing or preventing off-site sediment transport through use of settlement ponds, silt fences, and water treatment, and modifying or suspending activities during extreme rainfall and high winds to the extent practical.
 - Providing effective short term measures for slope stabilization, sediment control and subsidence control until long term measures for the operational phase can be implemented
 - Providing adequate drainage systems to minimize and control infiltration
- IFC EHS Guidelines, Industry Sector Guidelines, Onshore Oil and Gas contains the following direct reference to reinstatement (p13):
 - Clean-up and fully reinstate following construction activities (including appropriate revegetation using native plant species following construction activities) the pipeline right-of-way and temporary sites such as workforce accommodation camps, storage yards, access roads, helipads and construction workshops, to the pre-existing topography and drainage contours;
 - Reinstate off-site aggregate extraction facilities including borrow pits and quarries (opened specifically for construction or extensively used for construction).