DRAFT Environmental and Social Impact Assessment Report

Project Number: 50182-001
May 2018

INO: Riau Natural Gas Power Project
ESIA Vol.3&4_SIA & ESMP and Framework ESMS

Prepared by ESC for the Asian Development Bank

Riau 275 MW Gas Combined Cycle Power Plant IPP - ESIA

Medco Ratch Power Riau

ESIA Volume 3: Social Impact Assessment

AM039100-400-GN-RPT-1006 | V2

May 2018

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Project No:	AM039100
Document Title:	ESIA Volume 3: Social Impact Assessment
Document No.:	AM039100-400-GN-RPT-1006
Revision:	V2
Date:	May 2018
Client Name:	Medco Ratch Power Riau
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File Name:	I:\AENVW\Projects\AM039100 Riau\Deliverables\ESIA\Volume 3 - SIA\AM039100_Riau ESIA - SIA_V2_Final Draft for Disclosure.docx

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Document history and status

Revision	Date	Description	By	Review	Approved
V0	09/04/2018	First Draft for MRPR Review	A Manembu / A Kubale	D Burgdorf	B Clarke / E Morrissey
V1	19/04/2018	Final Draft for Issue	A Kubale	B Clarke	E Morrissey
V2	18/05/2018	Final Draft for Disclosure	A Kubale	B Clarke	E Morrissey

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Glossary

Term	Definition
Area of Influence	The project area of influence is defined through consideration of the project footprint including all ancillary project components and also considering project impacts on various environmental and social components. A number of project areas of influence may result but it is best to amalgamate them into an overall project area of influence. In addition to the area of geographical or spatial influence, temporal influence should also be determined. A geographical information system is a useful tool for this purpose.
Cut-off Date	Date of completion of the census and assets inventory of persons affected by the project. Persons occupying the project area after the cut-off date are not eligible for compensation and/or resettlement assistance. Similarly, fixed assets (such as built structures, crops, fruit trees, and woodlots) established after the date of completion of the assets inventory, or an alternative mutually agreed on date, will not be compensated.
Economic Resettlement	Loss of income streams or means of livelihood, resulting from land acquisition or obstructed access to resources (land, water, or forest) resulting from the construction or operation of a project or its associated facilities.
Environmental and Social Impact Assessment	Identifies and assesses risks and the impacts associated with the project and provides a series of mitigation measures that when implemented will ensure the project complies with the standards and guidelines it has be evaluated against.
Environmental and Social Management Plan	Summarises the mitigation and monitoring measures identified through the ESIA process and sets out the responsibilities for their implementation.
Environmental and Social Management System	Identifies and assesses risks and the impacts associated with the project and provides a series of mitigation measures that when implemented will ensure the project complies with the standards and guidelines it has be evaluated against.
Involuntary Resettlement	Resettlement is involuntary when it occurs without the informed consent of the displaced persons or if they give their consent without having the power to refuse resettlement.
Indigenous People	Social groups with identities that are distinct from mainstream groups in national societies, are often among the most marginalised and vulnerable segments of the population. In many cases, their economic, social, and legal status limits their capacity to defend their rights to, and interests in, lands and natural and cultural resources, and may restrict their ability to participate in and benefit from development.
Land Acquisition	Land acquisition includes both outright purchases of property and acquisition of access rights, such as easements or rights of way.
Legal and regulatory framework	The national legal and institutional framework applicable to the project should be defined. This should also include any additional lender requirements and any international agreements or conventions that may also apply.
Livelihood	Refers to the full range of means that individuals, families, and communities utilize to make a living, such as wage-based income, agriculture, fishing, foraging, other natural resource based livelihoods, petty trade, and bartering.
Livelihood Restoration Plan	The document in which a project sponsor or other responsible entity specifies the procedures that it will follow and the actions that it will take to mitigate adverse effects, compensate losses, and provide development benefits to persons and communities affected by an investment project. The Livelihood Restoration Plan relates specifically to cases where Project Affected Persons (PAPs) are economically displaced.
Physical Displacement	Loss of shelter and assets resulting from the compulsory acquisition of land associated with a project that requires the affected person(s) to move to another location.

Term	Definition
Project Affected Persons	Any person who, as a result of the implementation of a project, loses the right to own, use, or otherwise benefit from a built structure, land (residential, agricultural, or pasture), annual or perennial crops and trees, or any other fixed or moveable asset, either in full or in part, permanently or temporarily.
Resettlement Action Plan	The document in which a project sponsor or other responsible entity specifies the procedures that it will follow and the actions that it will take to mitigate adverse effects, compensate losses, and provide development benefits to persons and communities affected by an investment project. The Resettlement Action Plan relates specifically to cases where Project Affected Persons are physically displaced.
Vulnerable Groups	People who by virtue of gender, ethnicity, age, physical or mental disability, economic disadvantage, or social status may be more adversely affected by resettlement than others and who may be limited in their ability to claim or take advantage of resettlement assistance and related development benefits.

List of Abbreviations

Acronym	Meaning
ADB	Asian Development Bank
AMDAL	Analisis Mengenai Dampak Lingkungan
AoL	Area of Influence
CCPP	Combined Cycle Power Plant
CFPP	Coal Fired Power Plant
CSR	Corporate Social Responsibility
EHS	Environmental, Health and Safety
EIA	Environmental Impact Assessment
EPC	Engineering Procurement Construction
EPFI	Equator Principle Financial Institutions
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
ESMS	Environmental and Social Management System
FPIC	Free, Prior, and Informed Consent
GDI	Gender Development Index
GRDP	Gross Regional Domestic Product
HDI	Human Development Index
IFC	Institutional Finance Committee
LRP	Livelihood Restoration Plan
MRPR	Medco Ratch Power Riau
NBC	Nusa Buana Cipta
NGO	Non-Governmental Organisation
NTS	Non-Technical Summary
PAP	Project Affected Persons
PCR	Physical cultural resources
PLN	PT Perusahaan Listrik Negara (Persero)
RAP	Resettlement Action Plan
SEP	Stakeholder Engagement Plan
SIA	Social Impact Assessment
SPP	Sarana Pembangunan Pekanbaru

1. Introduction

1.1 Overview

The ESIA Volume 3: Social Impact Assessment (SIA) assesses how people and communities may be affected as a result of the Project in terms of the way they live, work and interact. The broad objectives of this SIA are to ensure that potential socio-economic and community impacts have been identified, assessed, mitigated and managed in a constructive manner. Social, economic and biophysical impacts of the Project are interrelated and this interrelationship is considered in the SIA. The human environment will be impacted by environmental impacts such as noise, dust, waste and traffic. These impacts are identified and taken into account in this SIA, but are addressed in detail in the ESIA Volume 2: Environmental Impact Assessment and other Technical Reports located in ESIA Volume 5: Technical Appendices.

Social and community impacts that have been assessed in this Volume and identified as potentially significant beneficial and negative include: employment, community health and safety and livelihood restoration. Environmental impacts from construction activities could also have community impacts, however, to avoid double counting of impacts these have been addressed within Volume 2 and are not covered in this SIA.

1.2 Structure of Volume 3

This ESIA Volume 3: SIA is structured in the following way:

- Section 2 – Legal and Regulatory Framework
- Section 3 – Impact Assessment Methodology
- Section 4 – Social and Economic Baseline
- Section 5 – Stakeholder Engagement
- Section 6 – Social Impact Assessment
- Section 7 – Cultural Heritage
- Section 8 – Mitigation, Monitoring, Enhancement Measures and Residual Impacts
- Section 9 – References

2. Legal and Regulatory Framework

2.1 Introduction

The purpose of this section is to set out the requirements that specifically apply to SIA for the Project. It is important that the Project meets local and internationally accepted environmental and social safeguard standards to ensure that community benefits are maximised and that potential adverse environmental and social impacts are minimised. Relevant national and international requirements are summarised in the following sections.

2.2 Indonesian Requirements

The following Indonesian regulations will act as a guideline for this SIA include:

Land Tenure and Customary People / Masyarakat Adat

- Constitutional Court Decision (MK) No.35 of 2012, effective May 16, 2013 State recognition of indigenous communities and their forests.

Land Acquisition

- National Land Head Agency Regulation No. 5 of 2012 and No. 06 of 2015 regarding Technical Guidelines for Land Procurement; and
- GoI Regulation PP No. 24 of 2010; No. 61 of 2012; and No. 105 of 2015 regarding Utilization of Forest Area.

Right to Provide Right and Accurate Information

- Environmental Management Act of 1997.

Cultural Heritage

- Presidential Decree PP No. 1 of 1987 Convention concerning the Protection of the World Cultural and Natural Heritage.

2.3 International Requirements

2.3.1 Asian Development Bank

The Asian Development Bank (ADB) is committed to ensuring the social sustainability of the projects it supports and this is outlined in the following:

- ADB Safeguard Policy Statement (ADB, 2009);
- Social Protection Strategy (2001); and
- ADB's Gender and Development Policy (2003).

Involuntary Resettlement and Indigenous Peoples Safeguards which are detailed in the ADB Safeguard Policy Statement (2009) are summarised further below.

Involuntary Resettlement Safeguards

The objectives of the Involuntary Resettlement Safeguards are to avoid involuntary resettlement wherever possible; to minimise involuntary resettlement by exploring project and design alternatives; to enhance, or at

least restore, the livelihoods of all displaced persons in real terms relative to pre-project levels; and to improve the standards of living of the displaced poor and other vulnerable groups. The Involuntary Resettlement Safeguards cover physical displacement and economic displacement and are triggered as a result of involuntary acquisition of land, or involuntary restrictions on land use or on access to legally designated parks and protected areas. It covers them whether such losses and involuntary restrictions are full or partial, permanent or temporary. The Involuntary Resettlement Safeguards includes 12 Policy Principles which are outlined in Volume 1 – Introduction.

The ADB Involuntary Resettlement Safeguards – A Planning and Implementation Good Practice Sourcebook Draft Working Document (ADB, 2012) outlines technical guidance and good practice recommendations in implementing the Safeguard Policy Statement with respect to involuntary resettlement. The source book uses ADB's own experience in effective planning and implementation of involuntary resettlement programmes and international good practices adopted by multilateral development banks.

Indigenous Peoples Safeguards

The objectives of the Indigenous Peoples Safeguards are to design and implement projects in a way that fosters full respect for Indigenous Peoples' identity, dignity, human rights, livelihood systems, and cultural uniqueness as defined by the Indigenous Peoples themselves so that they (i) receive culturally appropriate social and economic benefits, (ii) do not suffer adverse impacts as a result of projects, and (iii) can participate actively in projects that affect them.

The Indigenous Peoples Safeguards are triggered if a project directly or indirectly affects the dignity, human rights, livelihood systems, or culture of Indigenous Peoples or affects the territories or natural or cultural resources that Indigenous Peoples own, use, occupy, or claim as an ancestral domain or asset. The term Indigenous Peoples is used in a generic sense to refer to a distinct, vulnerable, social and cultural group possessing a range of characteristics in varying degrees, including:

- Self-identification as members of a distinct indigenous cultural group and recognition of this identity by others;
- Collective attachment to geographically distinct habitats or ancestral territories in the project area and to the natural resources in these habitats and territories;
- Customary cultural, economic, social, or political institutions that are separate from those of the dominant society and culture; and
- A distinct language, often different from the official language of the country or region.

In considering these characteristics, national legislation, customary law, and any International conventions to which the country is a part will be taken into account. A group that has lost collective attachment to geographically distinct habitats or ancestral territories in the project area because of forced severance remains eligible for coverage under this policy. The Indigenous Peoples Safeguards includes nine Policy Principles which are outlined in Volume 1 – Introduction.

The ADB Indigenous Peoples Safeguards – A Planning and Implementation Good Practice Sourcebook Draft Working Document (ADB, 2013) outlines technical guidance and good practice recommendations in implementing the Safeguard Policy Statement with respect to indigenous peoples. The source book uses ADB's own experience in effective planning and implementing indigenous peoples safeguards and international good practices adopted by multilateral development banks.

2.3.2 IFC Performance Standards

IFC's Performance Standards on Environmental and Social Sustainability (IFC, 2012), define the client's roles and responsibilities for managing their projects. They are also relevant to other institutions applying the Equator

Principles when making project financing decisions. Table 2.1 outlines the IFC Performance Standards that have been considered in relation to this SIA.

Table 2.1 : IFC Performance Standards and Objectives (IFC, 2012)

Performance Standard	Objectives
1 Assessment and Management of Environmental and Social Risks and Impacts	• To identify and evaluate environmental and social risks and impacts of the project. • To adopt a mitigation hierarchy to anticipate and avoid, or where avoidance is not possible, minimise, and where residual impacts remain, compensate/ offset for risks and impacts to workers, Affected Communities, and the environment. • To promote improved environmental and social performance of clients through the effective use of management systems. • To ensure that grievances from Affected Communities and external communications from other stakeholders are responded to and managed appropriately. • To promote and provide means for adequate engagement with Affected Communities throughout the project cycle on issues that could potentially affect them and to ensure that relevant environmental and social information is disclosed and disseminated.
2 Labour and Working Conditions	• To promote the fair treatment, non-discrimination, and equal opportunity of workers. • To establish, maintain, and improve the worker-management relationship. • To promote compliance with national employment and labour laws. • To protect workers, including vulnerable categories of workers such as children, migrant workers, workers engaged by third parties, and workers in the client's supply chain. • To promote safe and healthy working conditions, and the health of workers. • To avoid the use of forced labour.
3 Resource Efficiency and Pollution Abatement	• To avoid or minimise adverse impacts on human health and the environment by avoiding or minimising pollution from project activities. • To promote more sustainable use of resources, including energy and water. • To reduce project-related GHG emissions.
4 Community Health, Safety and Security	• To anticipate and avoid adverse impacts on the health and safety of the Affected Community during the project life from both routine and non-routine circumstances. • To ensure that the safeguarding of personnel and property is carried out in accordance with relevant human rights principles and in a manner that avoids or minimises risks to the Affected Communities.
5 Land Acquisition and Involuntary Resettlement	• To avoid, and when avoidance is not possible, minimise displacement by exploring alternative project designs. • To avoid forced eviction. • To anticipate and avoid, or where avoidance is not possible, minimize adverse social and economic impacts from land acquisition or restrictions on land use by (i) providing compensation for loss of assets at replacement cost and (ii) ensuring that resettlement activities are implemented with appropriate disclosure of information, consultation, and the informed participation of those affected. • To improve, or restore, the livelihoods and standards of living of displaced persons. • To improve living conditions among physically displaced persons through the provision of adequate housing with security of tenure at resettlement sites.
6 Biodiversity Conservation and Sustainable Management of Living Natural Resources	• To protect and conserve biodiversity. • To maintain the benefits from ecosystem services. • To promote the sustainable management of living natural resources through the adoption of practices that integrates conservation needs and development priorities.

Performance Standard	Objectives
7 Indigenous Peoples	• To ensure that the development process fosters full respect for the human rights, dignity, aspirations, culture, and natural resource-based livelihoods of Indigenous Peoples. • To anticipate and avoid adverse impacts of projects on communities of Indigenous Peoples, or when avoidance is not possible, to minimize and/or compensate for such impacts. • To promote sustainable development benefits and opportunities for Indigenous Peoples in a culturally appropriate manner. • To establish and maintain an ongoing relationship based on Informed Consultation and Participation (ICP) with the Indigenous Peoples affected by a project throughout the project's life-cycle. • To ensure the Free, Prior, and Informed Consent (FPIC) of the Affected Communities of Indigenous Peoples when the circumstances described in this Performance Standard are present. • To respect and preserve the culture, knowledge, and practices of Indigenous Peoples.
8 Cultural Heritage	• To protect cultural heritage from the adverse impacts of project activities and support its preservation. • To promote the equitable sharing of benefits from the use of cultural heritage.

Other international policies used to guide this SIA include:

- World Bank Environmental, Health and Safety (EHS) General and Industry Specific Guidelines;
- ILO Convention 169 of 1989 on the Indigenous and Tribal People's Convention;
- United Nations Declaration on Indigenous Peoples;
- Convention on Biological Diversity (CB; articles 8-j, 10-c, 17.2, 18.4 are important to indigenous people);
- The Ramsar Convention on Wetlands policies on indigenous people;
- The United National Framework Convention on Climate Change as it relates to indigenous people;
- Declaration on the Rights of Indigenous Peoples, IWGIA;
- The UN Global Compact;
- The International Labour Organization's Declaration on Fundamental Principles and Rights at Work; and
- The Rio Declaration on Environment and Development.

3. Impact Assessment Methodology

3.1 Introduction

The objective of the SIA is to determine the potential impacts of the Project on social and economic factors that influence the socio-economic well-being of the communities where the Project is proposed. To measure the influence of the Project on these factors, a socio-economic baseline is undertaken to establish existing characteristics of the community. This is followed by a discussion of the potential positive and negative impacts that could result from implementation of the Project including proposed measures to mitigate any potential negative impacts. The SIA has been completed in accordance with both national and international requirements.

3.2 Baseline Conditions

Baseline data collection refers to the collection of background data in support of the social assessment. Ideally baseline data is collected prior to development of a project, but often this is not possible. Data collection can also occur throughout the life of a project as part of ongoing monitoring of environmental and social conditions.

Baseline information used for this ESIA has utilised primary data collected through on-site surveys by Jacobs environmental and social sub-consultant Nusa Buana Cipta (NBC) between June 2017 to September 2017 (dry season and focusing on power plant) and January to February 2018 (wet season and focusing on gas pipeline and temporary jetty). Where applicable secondary data sources collected from desk-based studies and literature reviews have also been used and are referenced within the report.

3.3 Impact Identification

The impact assessment predicts and assesses the Project's likely positive and negative impacts, in quantitative terms to the extent possible. For each of the socioeconomic aspects of the project, the assessment identifies impacts and reports the likely significant impacts. An ESIA will always contain a degree of subjectivity, as it is based on the value judgment of various specialists and ESIA practitioners. The evaluation of significance is thus contingent upon values, professional judgement, and dependent upon the environmental context. Ultimately, impact significance involves a process of determining the acceptability of a predicted impact.

In broad terms, impact significance can be characterised as the product of the degree of change predicted (the magnitude of impact) and the value of the receptor/resource that is subjected to that change (sensitivity of receptor). For each impact the likely magnitude of the impact and the sensitivity of the receptor are defined. Generic criteria for the definition of magnitude and sensitivity are summarised below.

3.3.1 Direct vs Indirect Impacts

A direct impact, or first order impact, is any change to the environment, whether adverse or beneficial, wholly or partially, resulting directly from a social or environmental aspect. An indirect impact may affect an environmental, social or economic component through a second order impact resulting from a direct impact.

3.3.2 Magnitude Criteria

The assessment of impact magnitude is undertaken by categorising identified impacts of the Project as beneficial or adverse. Then impacts are categorised as ‘major’, ‘moderate’, ‘minor’ or ‘negligible’ based on consideration of parameters such as:

- Duration of the impact – ranging from ‘well into operation’ to ‘temporary with no detectable impact’.

- Spatial extent of the impact – for instance, within the site boundary, within district, regionally, nationally, and internationally.
- Reversibility – ranging from 'permanent thus requiring significant intervention to return to baseline' to 'no change'.
- Likelihood – ranging from 'occurring regularly under typical conditions' to 'unlikely to occur'.
- Compliance with legal standards and established professional criteria – ranging from 'substantially exceeds national standards or international guidance' to 'meets the standards' (i.e. impacts are not predicted to exceed the relevant standards) presents generic criteria for determining impact magnitude (for adverse impacts). Each detailed assessment will define impact magnitude in relation to its environmental or social aspect.
- Any other impact characteristics of relevance.

Table 3.1 below presents generic criteria for determining impact magnitude (for adverse impacts). Each detailed assessment will define impact magnitude in relation to its environmental or social aspect.

Table 3.1 : Magnitude criteria

Magnitude (beneficial or adverse)	Definition (considers likelihood, duration, number of people affected, spatial extent and local benefit sharing)
Major	A highly likely impact that would have implications beyond the Project's life affecting the wellbeing of many people across a broad cross-section of the population and affecting various elements of the local communities', or workers', resilience.
Moderate	A likely impact that continues over a number of years throughout the Project's life and affects the wellbeing of specific groups of people and affecting specific elements of the local communities', or workers', resilience.
Minor	A potential impact that occurs periodically or over the short term throughout the life of the Project affecting the wellbeing of a small number of people and with little effect on the local communities', or workers', resilience.
Negligible	A potential impact that is very short lived so that the socio-economic baseline remains largely consistent and there is no detectable effect on the wellbeing of people or the local communities' or workers', resilience.

3.3.3 Sensitivity Criteria

The significance of an impact has been determined by the interaction between its magnitude, and the sensitivity of receptors affected. Professional judgement has been used by appropriately qualified social scientists when assigning significance. The use of these two concepts for this assessment is outlined below.

The sensitivity of receptors has been estimated through consideration of their socio-economic vulnerability, measured by their capacity to cope with social impacts that affect their access to or control over additional or alternative social resources of a similar nature, ultimately affecting their wellbeing. Sensitive or vulnerable receptors are generally considered to have less means to absorb adverse changes, or to replicate beneficial changes to their resource base than non-sensitive or non-vulnerable receptors.

When considering sensitivity, the type of resources in question varies between receptors. For example, a community's vulnerability has generally been measured in terms of its resilience to loss of community facilities, whereas an individual's vulnerability has generally been considered in relation to their resilience to deprivation and loss of livelihood assets or opportunities (such as jobs, productive land or natural resources). Impacts that increase impoverishment risks contribute to vulnerability. Impoverishment risks include landlessness, joblessness, homelessness, marginalisation, increased morbidity and mortality, food insecurity, loss of access to

common property resources and social disarticulation. Table 3.2 below presents the guideline criteria that have been used to categorise the sensitivity of receptors.

Table 3.2 : Sensitivity criteria

Category	Description
High	An already vulnerable social receptor with very little capacity and means to absorb proposed changes or with very little access to alternative similar sites or services.
Medium	An already vulnerable social receptor with limited capacity and means to absorb proposed changes or with little access to alternative similar sites or services.
Low	A non-vulnerable social receptor with some capacity and means to absorb proposed changes and with some access to alternative similar sites or services.
Negligible	A non-vulnerable social receptor with plentiful capacity and means to absorb proposed changes and with good access to alternative similar sites or services.

3.3.4 Impact Evaluation

The determination of impact significance involves making a judgment about the importance of project impacts. This is typically done at two levels:

- The significance of project impacts factoring in mitigation inherently within the design of the project; and
- The significance of project impacts following the implementation of additional mitigation measures, referred to as residual impact.

Likely impacts are evaluated taking into account the interaction between the magnitude and sensitivity criteria as presented in the impact evaluation matrix in the table below.

Table 3.3 : Impact Evaluation Scale

		Magnitude			
		Major	**Moderate**	**Minor**	**Negligible**
Sensitivity	**High**	Major	Major	Moderate	Negligible
	Medium	Major	Moderate	Minor	Negligible
	Low	Moderate	Minor	Negligible	Negligible
	Negligible	Minor	Negligible	Negligible	Negligible

3.4 Mitigation

Mitigation measures are actions taken to avoid or minimise negative environmental or social impacts. Mitigation includes those embedded within design (as already considered as part of the impact evaluation) and any additional mitigation required thereafter. Additional mitigation will be implemented to reduce significance impacts to an acceptable level, this is referred to as the residual impact. The mitigation hierarchy should be followed: prevent or avoid, minimise, restore or remedy, offset, compensate. Mitigation measures should be clearly identified and linked to environmental and social management plans.

3.5 Monitoring

Monitoring is not linked to the impact evaluation but is an important component of the ESIA and allows for evaluation of the effectiveness of mitigation measures. Monitoring and follow-up actions should be completed to:

- Continue the collection of data throughout construction, operation and later decommissioning;
- Evaluate the success of mitigation measures, or compliance with project standards or requirements;
- Assess whether there are impacts occurring that were not previously predicted; and
- In some cases, it may be appropriate to involve local communities in monitoring efforts through participatory monitoring. In all cases, the collection of monitoring data and the dissemination of monitoring results should be transparent and made available to interested project stakeholders.

3.6 Residual Impacts

Those impacts that remain once mitigation has been put in place will be described as residual impacts, using Table 3.3 set out above.

3.7 Cumulative Impacts

The assessment of cumulative impacts will consider the combination of multiple impacts that may result when:

- The Project is considered alongside the existing facilities;
- The Project is alongside other existing or proposed projects in the same geographic area or similar development timetable; and
- Impacts identified in different environmental and social aspects of the ESIA combine to affect a specific receptor.

The assessment of cumulative impacts will identify where particular resources or receptors would experience significant adverse or beneficial impacts as a result of a combination of projects (inter-project cumulative impacts). In order to determine the full combined impact of the development, potential impacts during construction and operational phases have been assessed where relevant.

4. Social and Economic Baseline

4.1 Introduction

Social, economic and cultural baseline conditions for the power plant site and gas pipeline route are based on primary and secondary data. Primary data was initially gathered in June 2017 to September 2017 through a social survey undertaken by NBC in three administrative areas around the power plant site (*kelurahan*)[1], Bencah Lesung, Tuah Negeri and Industri Tenayan which are part of the City of Pekanbaru. Between January to February 2018 NBC gathered further primary data from five villages along the gas pipeline route. The five villages included: Kuala Gasib. Meredan, Pinang Sebatang, Tualang Timur all located within the Siak Regency and Melebung which is part of Pekanbaru City.

One further village (Okura) located on the opposite side of the Siak River to the temporary jetty location was not included as part of the social survey conducted by NBC. However, baseline information on the village is provided as there is potential for interaction between the Okura Villagers and the temporary jetty location. Primary data was gathered in the form of interviews which aimed to collect socio-economic data from the impacted villagers. Further data was gathered from health-centres and education services. There were 30 respondents interviewed for each village and therefore over the nine villages making up the social survey for the Project, a total of 270 respondents (55% male and 45% female) were interviewed. A summary of the findings of the social surveys are incorporated into this SIA.

It should be noted that at the time of baseline surveys being conducted the preferred route was the 'alternative gas pipeline route' shown in Figure 4.1 below. Following completion of baseline surveys a section of the gas pipeline route has changed, now referred to as the 'preferred gas pipeline route'. The social survey undertaken incorporates villages within the 10 km section of pipeline that has changed and therefore the survey data collected is considered representative of the preferred gas pipeline route.

The survey addressed the respondents' occupation, physical assets, education, income, access to financial resources, and access to public services such as water-electricity and sanitation facilities. The respondents were selected using a purposive sampling method to get a cross section of representative groups from society. The selection process included identification of thirty respondents in each administrative area, representing distinctive groups in society including village representatives, community leaders, commoners, female and male, the vulnerable and also the communities in the middle of palm oil plantations. The vulnerable groups consisted of poor women, the elderly, the disabled, and the disadvantaged groups such as the Nias, a community group who came to the area after the tsunami in 2004. The respondents consisted of various ethnicities such as the Malay, the original inhabitants, the Jawanese from North Sumatra, the Minang from West Sumatra, the Batak, and some ethnic Chinese. The respondents also included people from different livelihoods such as farmers, local businesswomen and men, landless, unemployed, traders, local government officers, and brick stone makers.

Secondary data was collected from the Pekanbaru City and Siak Regency statistics offices using 2016 and 2017 figures. Health data was collected from the health centres (puskesmas) and health sector publication data. Educational data was collected from the local Education Office and schools.

[1] In Indonesia, a subdistrict (kecamatan) is a subdivision of districts (kabupaten) and cities (kota). A sub-district is itself divided into administrative villages (kelurahan). An administrative village (kelurahan, desa) is the lowest level of government administration in Indonesia. It could be a village or a kelurahan. A village is headed by a village chief (kepala desa), who is elected by popular vote. A kelurahan is headed by a lurah, a civil servant appointed by local government (city or district). For the purposes of this report, an administrative area refers to a *kelurahan*.

4.2 General Setting

Pekanbaru is the capital of Riau Province, which is an oil and gas resource-rich region of Sumatra. In the past Riau also had many forest resources.

The power plant and transmission line is located in Industri Tenayan administrative area which is part of Tenayan Raya Sub-District of Pekanbaru. The power plant is located approximately:

- 10 km due east of the City of Pekanbaru in central Sumatra, Indonesia;
- 3 km south of the Siak River; and
- 2 km south of PT Perusahaan Listrik Negara (Persero) (PLN) existing 2 x 110 MW Tenayan Coal Fired Power Station (CFPP).

The power plant and switchyard will be accommodated inside approximately 9.1 ha of land. The power plant site is bounded by the palm oil plantations to the west, south and east and Road 45 to the north. The Project plans to construct a 750 m long 150 kV transmission line to tie into the Tenayan – Pasir Putih 150 kV existing transmission line. The other administrative areas close to the site location are Bencah Lesung and Tuah Negeri. These three are all part of the 11 administrative areas in Tenayan Raya Sub-District which were established in January 2017. Statistical data for each of the administrative areas was not available during the social survey.

The temporary jetty site is situated next to land owned by PLTU Tenayan a state –owned company, which has established the 2 x 110 MW CFPP on 40 ha of land (hereon referred to as Tenayan CFPP). This facility was built in 2013 in the Industri Tenayan administrative area (*kelurahan*) and has been in operation since January 2017. The gas pipeline route for the Project is situated in Koto Gasib, Tualang, Tenayan Raya subdistricts/kecamatan of Siak Regency and Pekanbaru City.

Within the Tuah Negeri administrative area are the Pekanbaru government offices. The Industri Tenayan *kelurahan* is a centre for industry within Pekanbaru.

The distance from the proposed power plant site to the nearest settlement of Bencah Lesung residential settlement is approximately 3 km and the distance to the Tuah Negeri settlement is about 5 km. The distance from Pekanbaru to Tenayan Raya district is about 14-15 km and there is a direct road connection available from the site to Pekanbaru. Even though Tuah Negeri and Bencah Lesung administrative areas are part of Pekanbaru City, they resemble discrete villages as opposed to being part of an urban area.

4.3 Project Area of Influence

The project area of influence (AoI) includes all communities potentially affected by the Project as well as the region surrounding the project where social interaction will take place and where local communities are likely to be impacted by the Project, either indirectly or directly.

The project location for the power plant, transmission lines, temporary jetty site, water pipeline and gas pipeline is spread across two administrative areas of Pekanbaru City and Siak Regency (kabupaten). The villagers and people affected by the Project live predominantly in these two administrative areas.

Figure 4.1 provides an overview of the Project and Figure 4.2 outlines the villages which the SIA will refer to.

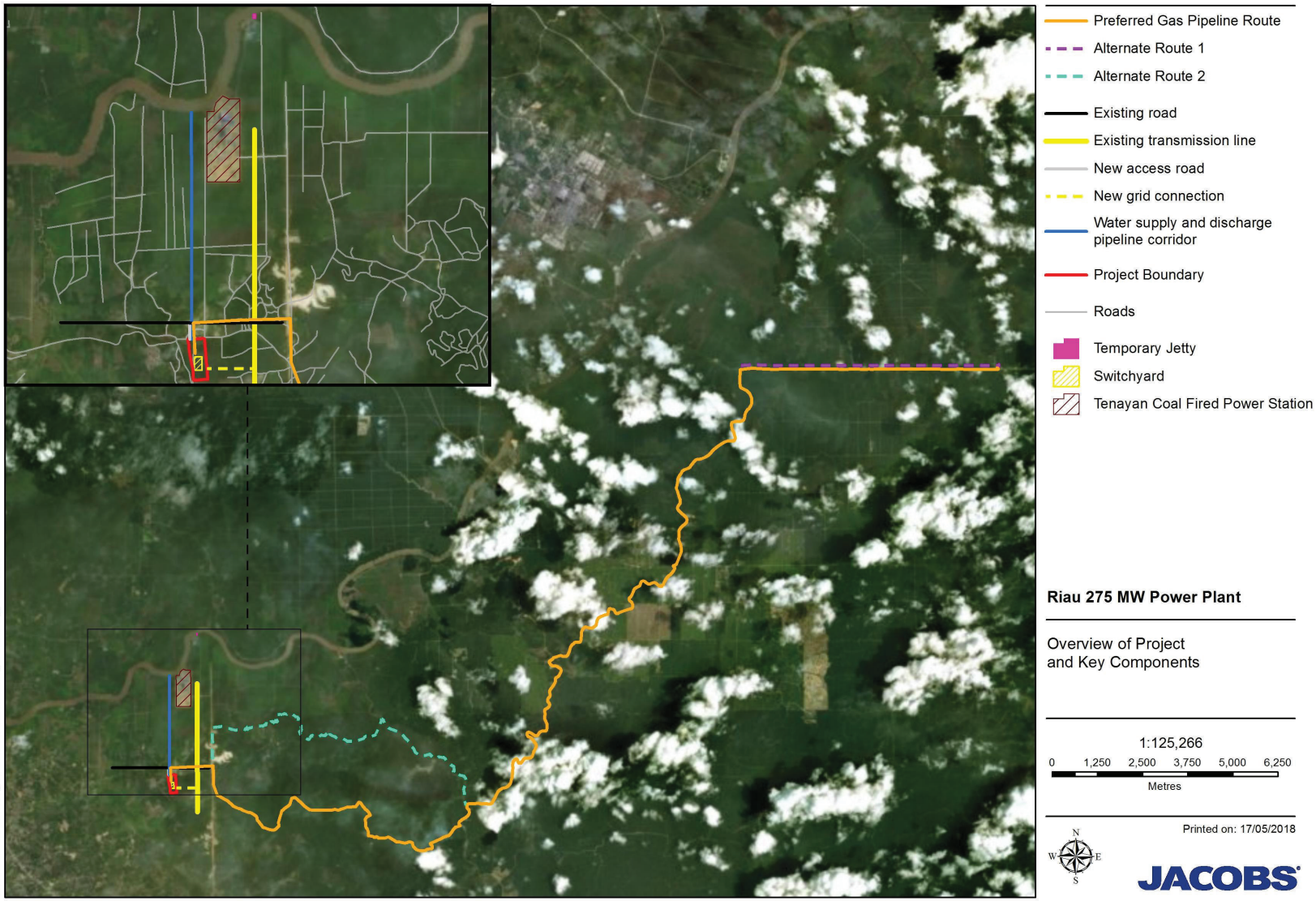

Figure 4.1 : Overview of Project and Key Components

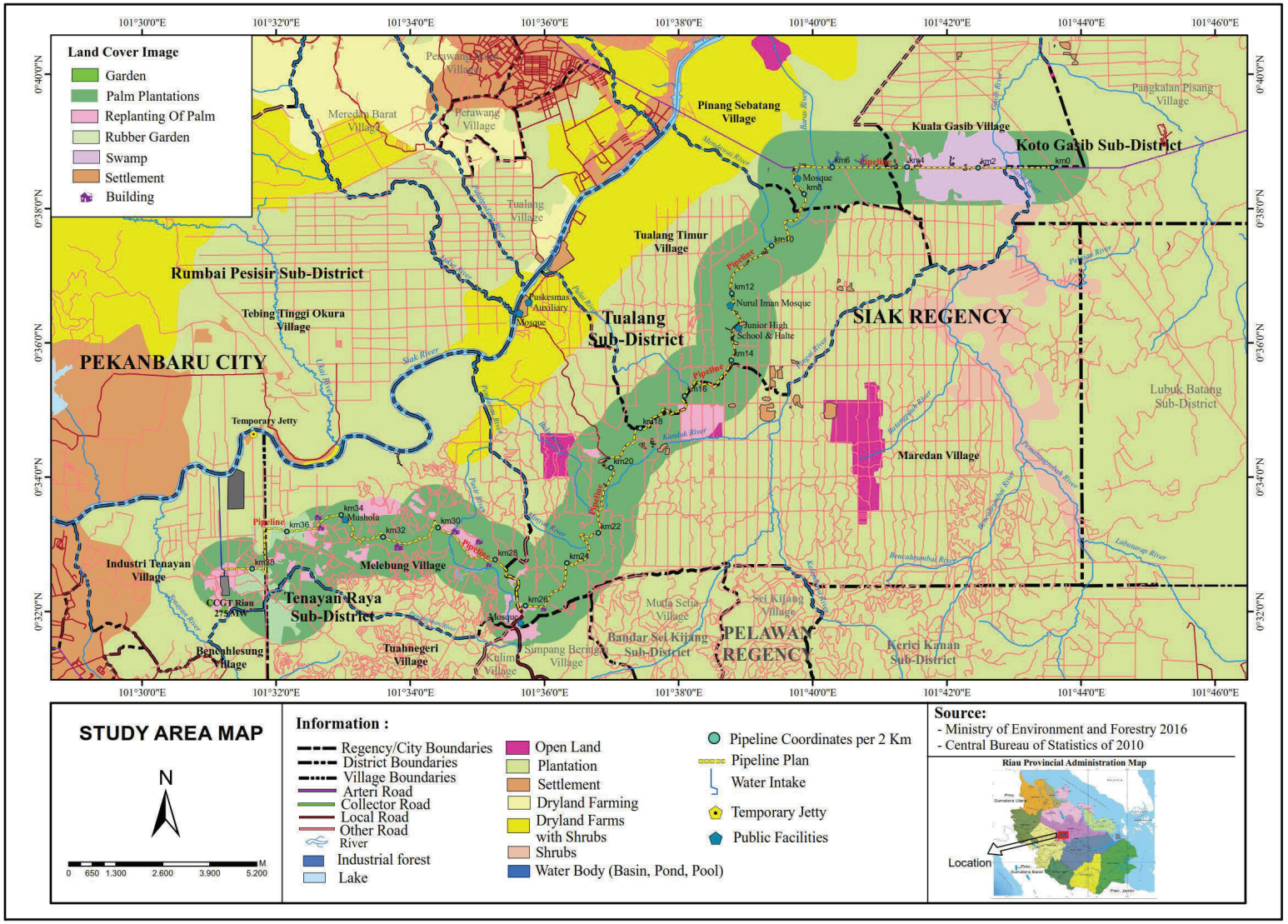

Figure 4.2 : Villages within Sub-Districts of Pekanbaru City and Siak Regency

The Project AoI covers the following:

- Power Plant: located near the three communities of Industri Tenayan, Bencah Lesung and Tuah Negeri which all form part of the Tenayan Raya Sub-District;
- Temporary jetty: located in the Industri Tenayan administrative area and adjacent to the Tebing Tinggi Okura (hereon referred to as Okura Village) settlement located across the Siak River within the Rumbai Pesisir Sub-District; and
- Gas pipeline: located near the following:
  - Melebung Village in Tenayan Raya Sub-District and part of Pekanbaru City District;
  - The villages of Tualang Timur Maredan and Pinang Sebatang located in Tualang Sub-District and part of the Siak Regency District; and
  - Kuala Gasib Village located in Koto Gasib Sub-District and part of the Siak Regency District.

4.4 Land Use and Tenure

4.4.1 Pekanbaru City

In accordance with local government terminology land use in the City of Pekanbaru can be divided into two main categories: developed areas and non-developed areas. Of the total developed area in the City of Pekanbaru around 23.55% or about 63,226 ha (632.26 km^2) consists of residential (73.29%), industrial (12.05%) and commercial (4.47%) land.

Under the undeveloped land category, 24,733.49 ha is classified as brush and scrub and 18,372.33 ha as plantation. This is mostly located in the northern area of Pekanbaru, which is in the Rumbai, Rumbai Pesisi and Tenayan Raya Sub-Districts. Based on BAPPEDA (Planning and Development Agency) data in Pekanbaru, land use in Tenayan Raya Sub-District covers only 10% or only 17,129 km^2. This is similar to the other two Sub-Districts of Rumbai and Rumbai Pesisir. Based on these findings, the city council plans to shift development away from the city centre, which is already very developed, to these three areas. Plans are underway for a new economic centre in Tenayan Raya and a tourism centre in Rumbai.

In relation to the above data, the planned development of the Industri Tenayan administrative area (KIT) and the Pekanbaru government office complex is to be located in the un-developed areas such as the plantation and scrub area with a total area of 43,105.82 ha. After several rounds of the planning process and based on the results of an assessment, Industri Tenayan and Tuah Negeri kelurahans were chosen as the location most suitable for development needs.

The KIT development plan was established with the drafting General Plan of Spatial Planning (RUTR) Pekanbaru 1991 - 2015. This was reinforced by Pekanbaru's Mayor's Decree No. 650/13-WK / 1999, which stipulates that the area allocated in Industri Tenayan is 1,550 ha. The KIT Master Plan was developed in 2001. At the initial stage of the KIT Master Plan, only 360 ha was scheduled to be developed with land acquisition of 266 ha in 2002. The only industrial development to date is the 2 x 110 MW Tenayan CFPP which utilised 40 ha of land and has been in use since 2013. In the near future, the construction of a container terminal and central market with an area of 14 ha will begin. Pekanbaru City has turned over KIT management to Sarana Pembangunan Pekanbaru (SPP) Company. The proposed KIT land is currently utilised as palm oil plantation.

Table 4.1 provides a breakdown of land allocated for plantations in Pekanbaru City.

Table 4.1 : Land Allocated for Plantations by Commodity in Pekanbaru City (2007)

No	District / Kecamatan	Area Size by Type of Plant (ha)*			
		Coconut	Palm oil	Rubber	Cane
1	Pekanbaru Kota	0	0	0	0
2	Sail	0	0	0	0
3	Sukajadi	0	0	0	0
4	Lima Puluh	0	0	0	0
5	Senapelan	0	0	0	0
6	Bukit Raya	158.45	14.91	0	0.96
7	Marpoyan Damai	42.39	10.51	0	0.80
8	Payung Sekaki	17.50	26.59	0	0
9	Tampan	26.45	15.01	1.50	17.77
10	Rumbai	145.49	1,531.60	0	0
11	Rumbai Pesisir	146.67	5,410.50	30.41	6.91
12	Tenayan Raya	429.01	2,191.87	39.87	0
	Pekanbaru	**965.69**	**9,200.99**	**71.78**	**29.38**

Source: Survey of Agriculture and Estate Crops Office Pekanbaru (2007)

*Area is aggregate not overlay

Based on the data presented above approximately 90% of the land allocated for plantations is located in Rumbai Pesisir, Tenayan Raya and Rumbai Sub-Districts. The most widely planted commodity in these three districts is palm oil. Particularly in Tenayan Raya district, in addition to plantation crops, there are also lots of cultivated land for horticulture, namely, vegetables and fruits (annual and seasonal). According to the same data, there is an area of 118.12 ha for cassava and corn, 15 ha for vegetable crops and 565.32 for fruit crops in Pekanbaru City. Then there are also 53.92 ha of land for cattle, goats, buffaloes, pigs and poultry farms, though most of the land is for raising cattle in Pekanbaru City. For fisheries, there is 3.4 ha of land used for catfish cultivation ponds in Pekanbaru City.

From the baseline survey results and interviews in the three village within the study area, it can be seen that palm oil plantations are found in the Industri Tenayan and Tuah Negeri administrative areas. Likewise, farmland and livestock are found in the Industri Tenayan and Tuah Negeri administrative areas. In the Bencah Lesung administrative area there is very little land available for plantations and agricultural land since most of it is allocated for settlements. In addition, in these three villages, land is used for the brick industry, on average between 200 - 300 m^2 which is spread out in residential areas, the majority of which is in Tuah Negeri.

In Rumbai Pesisir Sub-District, the number of palm oil plantations has more than doubled compared to the Tenayan Raya Sub-District. On the other hand, Rumbai Pesisir Sub-District has less coconut plantation and rubber area but more sugarcane area. Okura Village have more rubber than palm-oil plantation areas and many of the villagers also grow fruits.

4.4.2 Siak Regency

The principal oil field in Central Sumatra is found within the Siak Regency. The main basin is Minas Field, which was discovered in 1944 by the Japanese army and the first production was conducted in 1952, with total reserves estimated at 2 billion barrels. The production zone is estimated to be 28 km x 10 km with a depth of 2,000 ft – 2,600 ft. The number of production wells is about 345, including eight dry wells and 47 water injection

wells. The total field production was 350,000 barrels per day. However, throughout the first quarter of 2014, oil production had reached 230,170 barrels per day (Tempo Magazine, 8 July 2017).

Other than oil fields, approximately 33.7% of the land in the Siak Regency is categorised in the spatial plan as 'Other Utilization Area' (Areal Penggunaan Lain). The approximate remaining land use is as follows:

- 23.1% is categorised as state forest;
- 143,375.85 ha (20.9%) is categorised as plantation;
- 133,022.95 ha (19.4%) is not cultivated.

Currently, production forest areas included in the Siak Forest Management Unit and used for logging activities cover an area of 495,000 ha.

There are five important commodities for Siak Regency which include: palm oil, rubber, sago, coconut and cacao, see Table 4.2 below. It is important to note that Siak Regency data from 2014 stated that this regency has natural areas of peat, comprising up to 50% in all district areas, with a total coverage of 459,193 ha. Approximately 299,278 ha of this area has more than 3 m of peat depth (BPS Kab Siak, 2016; Pemda Siak, 2016).

Table 4.2 : Agricultural / Forest Commodities in Siak Regency

Commodity	2011 (ha)	2014 (ha)	2015 (ha)
Palm Oil	237,043	287,331	288,362
Rubber	13,851	15,768	15,477
Sago	11,758	11,522	10,150
Coconut	1,605	1,657	1,628
Cacao	61	66	54

Source: Forestry and Plantation Sector of Siak Regency (2016)

Palm oil covers the largest area, from 237,043 ha in 2011 to 288,362 ha in 2015. Rubber has been increasing from 2011 whilst sago, coconut and cacao areas have been in decline.

In relation to Project land use, the proposed power plant area is located in a palm oil plantation and villages along the gas pipeline route consist of significant palm oil plantation areas, especially in Melebung Village. Most of this Melebung Village area is in palm oil plantations managed mostly by companies and some are managed privately.

4.5 Social Organisation

Every village or Kelurahan has a village head or Kelurahan Head. Each village receives funds from the Regency and central government budget. The amount of village funds from the central government depends on the number of the people, level of poverty, the number of poor people, the distance of the village to the regency capital, and other factors.

The villagers have a yearly meeting to decide the agreed allocation of funds by involving all groups and factions. The result of the meeting will decide how the fund will be used.

The village or Kelurahan headman is assisted by the sub-village headman and Rural Government Board that consists of a village council the members of which are elected by the people.

There are also prominent village figures that are respected by the community. They are religious figures, and ethnic figures. The youth also often have their own organisation.

The female villagers have an organisation called PKK (Perkumpulan Kesejahteraan Keluarga / The Association for Family Welfare). This organisation deals with health, sanitation, education and other aspects. The Muslim women usually gather once a week for a prayer (wirid). The catholic women have a group named 'Wanita Katolik' ('Catholic Women') and the Protestant women have an organisation that is named 'The social organisation of Women'.

4.6 Demographic Overview

4.6.1 Population and Growth

Outlined in Table 4.3 below is a demographic overview of Pekanbaru City and Siak Regency and their Sub-Districts.

Table 4.3 : Demographic Overview of Pekanbaru City and Siak Regency

Area	Coverage Areas (km^2)	Total Population	Density	Male	Female	Total Households
Pekanbaru City	**632.26**	**1,064,556**	**1.684**	**546,400**	**518,166**	**253,533**
Tenayan Raya Sub-District	171.27	158,519	926	81,777	16,742	36,742
Siak Regency	**8,556.09**	**453,052**	**529**	**232,553**	**220,499**	**NA**
Tualang Sub-District	383.97	124,894	325	64,536	60,358	28,313
Koto Gasib Sub-District	702.7	22,059	31	11,230	10,829	5,323

Source: BPS Kota Pekanbaru (2017)

As outlined in Table 4.3 above, Siak Regency is about 13 times larger than Pekanbaru City. However, the the population in Pekanbaru City is much higher than Siak Regency (more than 100% total population of Siak Regency).

In general, the female population is lower when compared to the male population. However, the difference is not significant at the Regency and Sub-District level. The number of the households in Pekanbaru City are about 253,533 households with an average of four members in every household. Data is not available regarding the number of households in Siak Regency.

Among all the affected Sub-Districts, Koto Gasib Sub-District has the largest area (702.7 km^2) compared to Tualang Sub-District (383.97 km^2) and Industri Tenayan Sub-District (171.27 km^2). Tenayan Raya Sub-District has the highest number of households (36,742 households) and population (158,519 people) compared to Koto Gasib which has only 5,323 households and 22,059 people.

4.6.2 Population Composition

The population composition for the nine villages / kelurahans within the Project AoI area based on gender according to Pekanbaru City and Siak Regency statistics office is presented in Table 4.4 below. The table shows administrative area and villages based on their Sub-District, coverage area in km^2, sex, its total population, including density/km^2 and number of households.

Table 4.4 : Population Composition for Kelurahans and Villages within Project AoI

Sub-District / District	Kelurahan / Village	Coverage Area (km²)	Total Population			Density per km²	Total Households
			Male	Female	Total		
Tenayan Raya / Pekanbaru City	Industri Tenayan	24.54	2,223	2,133	4,356	178	1,124
	Bencah Lesung	19.01	1,068	1,127	2,195	115	572
	Tuah Negeri	10.1	5,180	5,197	10,377	1,027	2,544
Rumbai Pesisir / Pekanbaru City	Tebing Tinggi Okura	136.79	2,950	2,482	5,432	40	1,690
Tenayan Raya / Pekanbaru City	Melebung	36.67	451	383	834	23	151
Tualang / Siak Regency	Maredan	145.25	1,762	1,689	3,451	24	852
	Tualang Timur	9.98	3,021	2,716	5,737	575	1,637
	Pinang Sebatang	40.88	2,250	1,700	3,950	97	1,130
Koto Gasib / Siak Regency	Kuala Gasib	85.2	998	890	1,888	22	449

As shown in the table above, within the nine villages, the Tuah Negeri administrative area has the highest population with 10,377 inhabitants. Melebung Village located in the middle of the palm oil plantation has the smallest population with 834 inhabitants. Maredan Village has the largest area size (145.2 km²) followed by the old village of Okura located across the Siak River from the Tenayan CFPP.

The villages with the smallest land area have the highest number of families and population. Among the nine villages, Bencah Lesung and Tuah Negeri have the population with the largest number of females. Tuah Negeri is the most densely populated area followed by Tualang Timur Village and Industri Tenayan administrative area.

An overview of the population age group with Pekanbaru City and Siak Regency is presented in Table 4.5 below.

Table 4.5 : Population Age Group within Pekanbaru City and Siak Regency

Age Group	Pekanbaru City 2017	Siak Regency 2016
0 – 4	109,012	40,052
5 – 9	94,233	55,345
10 – 14	87,316	54,867
15 – 19	101,860	44,669
20 – 24	123,587	41,373
25 – 29	101,873	46,834
30 – 34	91,377	50,180
35 – 39	86,621	44,577

Age Group	Pekanbaru City 2017	Siak Regency 2016
40 – 44	76,456	38,475
45 – 49	62,326	28,058
50 – 54	46,609	17,658
55 – 59	34,521	11,742
60 – 64	20,597	7,729
65+	28,128	10,408
TOTAL	**1,064,566**	**453,052**

Based on the data shown above the largest population group in Pekanbaru City and Siak Regency is generally the young between the age groups of 0-4 years old to 30-34 years old. In both areas, the population decreases beyond the group of 35.

4.7 Religion

No statistical data is available of religious groups at Pekanbaru City or Siak Regency level. However, there is statistical data for some of the villages within the AoI as detailed in Table 4.6 below.

Table 4.6 : Religious Composition of Population some Villages / Kelurahans within Project AoI

Kelurahan / Village	Religious Composition of Population						Total
	Islam	Catholic	Protestant	Hindu	Buddhist	Taois / Confucism	
Industri Tenayan	594	641	320	534	64	42	2,195
Meredan	2,246	55	1,125				3,426
Pinang Sebatang	2,740	455	769		26		3,990
Kuala Gasib	1,999	10	304				2,313

As outlined in the table above, Islam is the most widely practiced religion in all villages, followed by Catholic, Protestant, Hindu, Buddhist and Taoism/Confucism. In some areas of Siak Regency, Bahai is also practiced. Pinang Sebatang and Kuala Gasib villages have more Protestants than Catholics.

There are 651 mosques in Pekanbaru and 449 small mosques (musholla). Also there are 153 Protestant churches and 10 Catholic churches. In addition, Pekanbaru City has 59 Confucius temples (kelenteng) and Vihara for Buddhists (Bappeda, 2015). There is no data available on religion for Siak Regency.

4.8 Ethnicity and Language

No statistical data on ethnic groups in Pekanbaru City or Siak Regency is available. One of the original native ethnic groups in the project area is the Malay. Near the power plant, there are other ethnic groups such as the Jawanese and the Batak from North Sumatra also the Minang from West Sumatra and the Nias ethnic group who came after the tsunami in 2004. In addition, a small Chinese population have lived in this region for generations, mostly in Pekanbaru City and Selat Panjang Sub-District.

Along the gas pipeline route there are numerous migrants from North Sumatra (The Bataks or the Jawanese) and some from West Sumatra. A small proportion of the population come from other areas of Indonesia. Along the gas pipeline route, there are also Malays from Gasib Village. Some of the Gasib people reported that they relocated from Johor in Malaysia a hundred years ago. The Malay ethnic group are living around the temporary jetty area and have lived there for generations. In Melebung there are Ambon and Nias people.

Bahasa Indonesia is commonly spoken in Riau, including Pekanbaru, but each ethnic group has their own language.

The Malay speak their own language (Okura), similarly the Batak, the West Sumatra and the Nias, all speak their own language or mix of languages between their own language and the Indonesian language.

4.9 Gender

As noted in Section 4.5.2, there are approximately 10% more males than females in Pekanbaru City, but there are four Sub-Districts that have more females compared to males: Sail, Lima Puluh, and Payung Sekaki and Senapelan.

It is important to note that there is a decreased rate of violence against women and children from 2011 compared to 2016 as indicated by Pekanbaru's mayor in the LKPJ (Performance Accountability Report, 2016).

All Sub-District heads are male and almost all heads of the administrative areas are male. The head of Tenayan Sub-District is also a male. There is only one female administrative area head, who used to be a community facilitator. In public consultations in relation to the Project, this leader called on the company to ensure that women are employed at the power plant.

Female parliament members make up 20% of Pekanbaru's legislature (DPRD) and in Siak Regency, only 2.5% of the DPRD members are female.

As this information suggests, most decision-makers in the community are male, which creates situations where women's needs and aspirations are often neglected. In order to ensure appropriate representation and opinion for the Project, consultation between male and female was separated.

Table 4.7 below provides an overview of Riau Province Districts gender development index. Gender Development Index (GDI) measures gender gaps in human development achievements by accounting for disparities between women and men in three basic dimensions of human development—health, knowledge and living standards using the same component indicators as in the GDI. (http://hdr.undp.org/en/content/gender-development-index-gdi).

Table 4.7 : Gender Development Index within Riau Province Districts (2014)

District	Gender Development Index 2014
Kuantan Singingi	87.81
Indragiri Hulu	86.27
Indragiri Hilir	80.99
Pelalawan	87.83
Siak	89.3
Kampar	88.78
Rokan Hulu	79.36
Bengkalis	88.86

District	Gender Development Index 2014
Rokan Hilir	84.3
Kepulauan Meranti	84.37
Pekanbaru	91.83
Dumai	89.35
Riau	**87.62**

Source: BPS Riau (2017)

The table above shows that Pekanbaru City has the highest GDI Index (91.83) and Siak District is the third highest in Riau Province (89.3).

Some of the villagers within the Project AoI come from West Sumatra and are referred to as the Minang. Some Minang communities are matrilineal means tracing descent through maternal line. The Minang women are famous as good traders.

4.10 Indigenous People

IFC Performance Standard 7 recognises that Indigenous Peoples, as social groups with identities that are distinct from mainstream groups in national societies, are often among the most marginalised and vulnerable segments of the population. In many cases, their economic, social, and legal status limits their capacity to defend their rights to, and interests in, lands and natural and cultural resources, and may restrict their ability to participate in and benefit from development. Indigenous Peoples are particularly vulnerable if their lands and resources are transformed, encroached upon, or significantly degraded. Their languages, cultures, religions, spiritual beliefs, and institutions may also come under threat. As a consequence, Indigenous Peoples may be more vulnerable to the adverse impacts associated with project development than non-indigenous communities. This vulnerability may include loss of identity, culture, and natural resource-based livelihoods, as well as exposure to impoverishment and diseases.

Moreover, Performance Standard 7 defines the term “Indigenous Peoples” as referring to a distinct social and cultural group possessing the following characteristics in varying degrees:

- self-identification as members of a distinct indigenous cultural group and recognition of this identity by others;
- collective attachment to geographically distinct habitats or ancestral territories in the project area and to the natural resources in these habitats and territories;
- customary cultural, economic, social, or political institutions that are separate from those of the mainstream society or culture; or
- a distinct language or dialect, often different from the official language or languages of the country or region in which they reside.

The term ‘indigenous peoples’ presents difficulties when it is applied to the Indonesian context. Indonesia has more than 350 different ethnic groups who consider themselves ‘original’ to Indonesia. They have their own self-identification, their own language and their own territory and many of them are already integrated in the mainstream economy and political system.

The term *’masyarakat adat*’ (customary communities) in Indonesia means the customary people or communities who live with their own beliefs, systems and have a different language than majority of Indonesia and their livelihood is their survival. This term has more appropriate application with certain groups that need protection of their livelihoods, norms, cultures and values since changes in their livelihood, land-ownership means marginalisation and ultimately destruction of their well-being.

The *masyarakat adat* in Riau Province consist of the Sakai, the Talang Mamak, and the Akit peoples (sea gypsies). The Talang Mamak live in the highland areas of Siberida District and the Sakai live in Dumai District and the Akit people live in Riau Islands. In the past, their livelihoods were based on hunting and gathering. This is still the case with some groups of the Talang Mamak. The Sakai have lost their forest and some of them work on oil palm plantations as labourers. The Akit still practice their traditional modes of living. Without their social and environmental well-being, their cultures will be very vulnerable to extinction and it will not be easy for them to adapt to a new livelihood compared with other adat groups. There are no *masyarakat adat* residing in the Project AoI.

4.10.1 Malay

In the Project area, the majority of the population are Malay. Oyvind Sandbukt an anthropologist who studied and worked in Riau for several years, noted the following about the Malay/Melayu people (pers comm, February 2018):

> *"The Malay ethnic identity is a highly generalized one based on homogenous language and religious adherence. Become a Muslim in Malay equals to "masuk Melayu." They have a kind of bilateral kinship systems. Malay is a lingua franca that may have limited or suppressed language differentiation. Interlinked coastal chieftainships, which morphed in kingdoms, fed on both local trade and on inter Asian trade through the Malacca strait and greatly contributed to the homogenization of language."*

Moreover, based on AMAN's customary map (www.aman.go.id) there are no *adat* rights in Pekanbaru City, or in the Okura and the Koto Gasib Village areas. Based on the baseline social survey, the Batin Tenayan claimed that they have land rights in Tenayan administrative area, but the exact location is not clear. Some of the power plant's facilities will be located in the Tenayan Raya Sub-District.

During the reign of the Siak kingdom, governance rights were given to certain families by the Sultans. The one who received the mandate is called '*the batin'*. The present day Batin Tenayan may have inherited this mandate according to some sources (NBC social survey, 2018). Some say that the Batin claim is already settled by the city government. It is important to note that the Head of Tenayan administrative area stated that there are no *masyarakat adat* claims on the power plant site location. Further verification may be needed.

4.10.2 Okura People

At the temporary jetty location, some of the Okura people stated that this was part of their fishing area in the past. Compensation was already given by the existing Tenayan CFPP but it was only limited to farmer groups.

4.10.3 Kuala Gasib

Some of the gas pipeline route is located in the Kuala Gasib Village administrative area which was once part of the Gasib kingdom. There is also a burial site of Kaca Mayang princess close to the gas pipeline route. The people are from the Malay ethnic group.

IFC Performance Standards

According to IFC Performance Standard 7 criteria, Indigenous Peoples refers to a distinct social and cultural group possessing the following characteristics in varying degrees:

- Criteria 1. Self-identification as members of a distinct indigenous cultural group and recognition of this identity by others.
- Criteria 2. Distinct language or dialect, often different from the official language or languages of the country or region in which they reside.
- Criteria 3. Collective attachment to geographically distinct habitats or ancestral territories in the project areas and to the natural resources in these habitats and territories and in the project.

- Criteria 4. Customary cultural, economic or political institutions are separate from those of the mainstream society or culture.

Table 4.8 below provides consideration of the cultural groups identified against IFC Performance Standard 7 criteria.

Table 4.8 : Analysis of Cultural Groups against IFC Performance Standards 7 Criteria

IFC Performance Standard 7 Criteria	Batin Tenayan Claims in Power Plant Site	Koto Gasib Villagers	Batin Tenayan Claims in Power Plant Site
	Batin Tenayan's land claim is not yet confirmed	**None in the gas pipeline area**	**Present at the temporary jetty site area**
Criteria 1	Self-identification as the Malay family who receive the mandate from Siak Sultan is clear to the descendants, recognition by others is ambiguous.	Recognition by the local government is clear. Some Gasib villagers there is no descendent of Gasib Kingdom anymore.	Self-identification as the Malay from Okura is strong and recognition by other groups is clear.
Criteria 2	Language is similar to other Malay group.	Language is similar to other Malay group.	Language is similar to other Malay group.
Criteria 3	Batin families' attachment to mandate areas.	Collective attachment to kingdom territories. Some said that land claim has been compensated long time ago.	Collective attachment is clear.
Criteria 4	Some customary cultural institutions are not separate from the other Malay groups, who are the original inhabitants of Riau Province.	Some customary cultural institutions are similar but stronger cultural practices implemented by the villagers and local government. Economic and political institutions are similar to the rest.	Share cultural customs, economic and political institutions both traditional and as part of the Indonesian state.

ADB Social Safeguard Criteria definition of indigenous people

ADB Criteria on indigenous peoples are similar to the IFC Criteria. ADB Safeguards defines "Indigenous Peoples" in a generic sense to refer to a distinct, vulnerable, social, and cultural group possessing the above four characteristics in varying degrees. ADB employs the term 'vulnerable' which is not found in the IFC definition. Since ADB's criteria is similar, the above analysis is similar and relevant to this Project.

Conclusion

The Batin Tenayan, Koto Gasib and Okura people have not been disadvantaged by the state policy nor do they live in an isolated area. Their culture is part of the majority Malay culture. In this respect, these populations do not satisfy the criterion above as to be classified as "Indigenous people". Nevertheless, the cultural heritage of Koto Gasib should be respected and should be taken into account in any future construction activities for the gas pipeline.

The Okura people are also part of the majority culture and language, but their land ownership rights need to be compensated fairly, a residual impact from the Tenayan CFPP that still needs to be addressed. Similarly, the Pekanbaru government needs to assist in determining the exact location of the Batin Tenayan's land claim. In this respect, these populations do not satisfy the criterion above as to be classified as "Indigenous People" and therefore are not assessed in this ESIA further.

4.11 Ecosystem Services

Ecosystem services are defined by the IFC Performance Standards (2012) as the benefits that people, including businesses, derive from ecosystems. They are organised into four types: (1) provisioning services (the products people obtain from ecosystems); (2) regulating services (the benefits people obtain from the regulation of ecosystem processes); (3) cultural services (the nonmaterial benefits people obtain from ecosystems); and (4) supporting services (the natural processes that maintain the other services).

The transport of heavy equipment and material for the Project is anticipated to be via the Siak River. The Siak River is also used by the Okura villagers for transport and for food (principally fish). Similarly, rivers that are crossed by the gas pipeline within the Siak Regency are used by villagers for fishing and boat transport and other needs such as bathing and washing clothes.

Other villagers within Kuala Gasib, Meredan, Pinang Sebatang, Melebung also use rivers for various purposes. In all these villages, many people use wells for drinking water, bathing and washing. Villagers along the river and at riparian areas develop charcoal from local trees for cooking and drying fish.

In addition, villagers cultivate land for their livelihood. Ecosystem shapes peoples culture. Many of the poems and songs are derived from nature and many stories are related to trees and animals from the forests. Their canoes, paddles and houses are from trees.

Villagers along the gas pipeline (Kuala Gasib, Maredan, Tualang Timur and Pinang Sebatang) also plant medicinal plants such as ginger, turmeric, temulawak, mostly within the confines of their own properties. A study of medicinal plants in Situgal Village close to Tesso Nilo National Park, Riau Province have found more than 500 types of medicinal plants. But the Project affected villages have already lost their forest including their medicinal plants before the Project commences.

4.12 Economic Profile

Understanding the influence of various sectors in the Project area will assist in identifying potential community development projects which could shape the Company Social Responsibility Program. An overview of the economic profile of Pekanbaru City is detailed in Table 4.9 below.

Table 4.9 : Overview of the Gross Regional Domestic Product by Industry within Pekanbaru City

Sectors	Gross Regional Domestic Product (GRDP) at Current Prices by Industry in Pekanbaru, 2010 – 2016 (Percentage)						
	2010	2011	2012	2013	2014	2015	2016
Agriculture, Forestry and Fisheries	1.76	1.73	1.66	1.69	1.57	1.6	1.63
Mining and Quarrying	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Processing Industry	20.86	20.92	20.6	20.29	18.98	19.97	19.93
Provision of Electricity and Gas	0.22	0.2	0.17	0.16	0.16	0.18	0.2
Water Supply, Waste Management, Waste and Recycling	0.03	0.02	0.02	0.02	0.02	0.02	0.02
Construction	28.93	29.02	28.8	29.58	29.98	29.6	29.7
Wholesale and Retail: Repair of Cars and Motorcycles	28.45	28.51	28.85	28.32	30.01	29.31	29.6
Transportation and Warehousing	2.41	2.33	2.38	2.47	2.43	2.52	2.54
Provision of accommodation, foods &	1.81	1.84	1.98	2.09	2.39	2.17	2.1

Sectors	Gross Regional Domestic Product (GRDP) at Current Prices by Industry in Pekanbaru, 2010 – 2016 (Percentage)						
	2010	2011	2012	2013	2014	2015	2016
drinks							
Information and Communication	2.6	2.45	2.46	2.32	2.14	2.17	2.1
Financial Services and Insurance	3.25	3.4	3.63	3.7	3.61	3.55	3.56
Real Estate	2.88	2.93	2.91	2.91	2.76	2.87	2.8
Company Services	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Administration, Defence and Compulsory Social Security	4.37	4.18	4.22	4.08	3.46	3.29	3.07
Education services	1.16	1.14	1.05	1.04	1.11	1.14	1.12
Health Services and Social Activities	0.41	0.42	0.42	0.44	0.45	0.49	0.48
Other services	0.84	0.87	0.81	0.85	0.9	1.08	1.1
Gross Domestic Regional Product	**100**	**100**	**100**	**100**	**100**	**100**	**100**

Source: BPS Pekanbaru City, 2017

Construction, wholesale and retail, and processing industries are the third largest sectors contributing to GRDP in Pekanbaru City. Between 2010-2016, growth in the following sectors was in decline: agriculture –forestry and fisheries, processing industry, real estate, information and communication, administration-defence and compulsory social security, and education services. In contrast, construction, transportation and warehousing, health services and other services are slowly increasing in GRDP. Company services, mining and quarrying are stable whilst electricity and gas fluctuates. The construction and wholesale and retail sectors are the highest contributors to Pekanbaru's GRDP. An overview of the economic profile of Siak Regency is detailed in Table 4.10 below.

Table 4.10 : Overview of the Gross Regional Domestic Product by Industry within Siak Regency

Sectors	Gross Regional Domestic Product (GRDP) at Current Prices by Industry in Pekanbaru, 2011 – 2016 (Percentage)					
	2011	2012	2013	2014	2015	2016
Agriculture, Forestry and Fisheries	15.42	14.05	14.15	15.04	17.27	18.46
Mining and Quarrying	47.15	53.18	51.49	48.01	38.89	36.5
Processing Industry	30.72	26.42	27.49	29.4	34.82	35.38
Provision of Electricity and Gas	0	0	0	0	0.01	0.01
Water Supply, Waste Management, Waste and Recycling	0	0	0	0	0	0
Construction	3.43	3.11	3.35	3.48	4.17	4.55
Wholesale and Retail: Repair of Cars and Motorcycles	1.16	1.13	1.24	1.58	1.83	1.98
Transportation and Warehousing	0.07	0.07	0.07	0.08	0.1	0.1
Provision of accommodation, foods & drinks	0.02	0.03	0.03	0.04	0.04	0.05
Information and Communication	0.14	0.14	0.15	0.16	0.2	0.2

Sectors	Gross Regional Domestic Product (GRDP) at Current Prices by Industry in Pekanbaru, 2011 – 2016 (Percentage)					
	2011	2012	2013	2014	2015	2016
Financial Services and Insurance	0.18	0.24	0.27	0.32	0.34	0.35
Real Estate	0.25	0.27	0.29	0.32	0.39	0.41
Company Services	0	0	0	0	0.01	0.01
Administration, Defense and Compulsory Social Security	0.64	0.62	0.64	0.65	0.78	0.78
Education services	0.38	0.34	0.36	0.4	0.48	0.5
Health Services and Social Activities	0.12	0.12	0.12	0.14	0.19	0.19
Other services	0.31	0.28	0.32	0.38	0.48	0.52
Gross Domestic Regional Product	**100**	**100**	**100**	**100**	**100**	**100**

In contrast to Pekanbaru City, Siak Regency's three biggest sectors that contribute to the GRDP are: mining and drilling, processing industry and agriculture, forestry and fisheries.

Mining and drilling growth sectors are on a downward trend, whereas in the transportation and warehousing sector, education and health services sectors, information and communication sectors, growth is gradually increasing in GRDP.

4.12.1 Livelihood of Villages within AoI

In general, the livelihood of the villagers varies from one village to another, and each family tends to have a primary and secondary job. Most of the villages along the gas pipeline work as palm oil plantation workers and farmers. Some of the Melayu people tap rubber and fish. In addition, some of the villagers have also opened restaurants, based upon the increased traffic passing their villages. For example, Tualang Timur Village, Kuala Gasib Village, and Pinang Sebatang Village have developed new restaurants. Some of them have also opened a workshop and a few of them work as employees.

The villagers in Melebung Village, which are located in the middle of the palm oil plantation, generally work as fishermen and palm oil plantation workers. The inhabitants of Okura Village, mostly of Malayan origin, generate income from rubber-tapping as their traditional livelihood. Some of their families also plant palm oil. The inhabitants of this village also work as fishermen along the river bank, even though the fish population is decreasing due to the pollution in the river.

The villages near the power plant are close to Pekanbaru City. Most of the villagers work as public servants, private company employees and traders. The villagers of Tuah Negeri and Bencah Lesung make bricks. Some of the villagers have secondary jobs growing fruit such as pineapple, raising cows, pigs and fish. Some of the women also make bricks, open food stalls, raise farm animals and plant spices and vegetables.

Some villagers in Bencah Lesung make tofu and crackers as secondary jobs to support their living. Due to the proximity of the village with Pekanbaru, villagers of Minang and Chinese ethnicities tend to open electronic shops, grocery shops, restaurants and hand phone shops. Some villagers in Industri Tenayan administrative area also grow corn, vegetables and pineapples. Some of them also make bread, while others open small shops and food stalls as secondary jobs. Figure 4.3 below provides an overview of the market at Tualang Timur Village.

Figure 4.3 : Market at Tualang Timur Village (NBC Social Survey Report, 2018)

Income and Expenditure

For the five villages along the gas pipeline route, it is important to understand their economic status. Based on data obtained during the social survey from respondents from the five villages along the gas pipeline route, their income is detailed in Table 4.11 below.

Table 4.11 : Average Income per month for each Household for Villages along the Gas Pipeline Route

Income (IDR)	Village				
	Melebung	Meredan	Pinang Sebatang	Tualang Timur	Kuala Gasib
< 500,000		10%			
500,000 – 1,000,000	3.3%		10%	3.3%	10%
1,000,000 – 2,500,000	80.0%	60%	40%	53.3%	50%
2,500,000 – 5,000,000	10.0%	20%	33%	33.3%	30%
5,000,000 - 10,000,000	6.7%	6.7%	10%	3.3%	10%
> 10,000,000		3.3%	7%	3.3%	
No income				3.3%	
Total	**100%**	**100%**	**100%**	**100%**	**100%**

More than 50% of respondents' income in the five villages is between 1,000,000 (USD 72.63) to 5,000,000 (USD 363.17). The lowest income village is Meredan Village with only 10% of respondents having income less than 500,000 (USD 36.31). In contrast, a small proportion of the respondents in Meredan Village, Pinang Sebatang and Tualang Timur Villagers have an income of more than IDR 10,000,000 (USD 720.63). Approximately 3.3% of respondents in Tualang Timur Village have no income.

In relation to the land acquisition process, the villagers with low incomes are most likely those who cannot afford to obtain legal certificate for their properties. This situation needs to be taken into consideration during the negotiation process for the right of way for the gas pipeline construction. The majority of their income which is at poverty level should be put into consideration as well.

Data on expenditure per month for each village along the gas pipeline route was also collected as part of the social survey and is presented in Table 4.12 below.

Table 4.12 : Average Expenditure per month for each Household along Gas Pipeline Route

Expenditure (IDR)	Village				
	Melebung	Meredan	Pinang Sebatang	Tualang Timur	Kuala Gasib
750,00 – 1,000,000	13.3%	6.4%	10%		16.7%
1,100,000 – 2,000,000	50.0%	36.7%	36.7%	36.7%	16.7%
2,100,000 – 3,000,000	23.3%	30.0%	13.3%	26.7%	36.7%
3,100,000 – 4,000,000		10.0%	16.7%	13.3%	10%
4,100,000 – 6,000,000	6.6%		6.6%	3.3%	10%
6,100,000 – 10,000,000	3.3%	6.7%	6.6%	3.3%	3.3%
> 10,000,000		3.3%	3.3%		
None	3.3%	3.3%	6.7%	10%	
Total	100%	100%	100%	100%	100%

In line with the income level, more than 50% of the respondents have a monthly expenditure between 1,100,000 (USD 79.89) to 3,000,000 (USD 217.9). The next highest is monthly expenditure between 3,100,000 (USD 225.16) to 4,100,000 (USD 297.83). There is a wealthy group category consisting of around 3.3% of respondents that has expenditure more than 10,000,000 (USD 720.63) per month.

4.13 Educational Profile

There are three types of education providers in Riau Province; 1) state schools, 2) private schools, both of which are under the supervision of the Ministry of Education, and 3) schools under the Ministry of Religious Affairs. The private schools can determine their school fees, however, many of them are also supported financially by the Ministry of Education. The Ministry of Religious Affairs is responsible for schools such as Madrasah, Tsanawiyah and Aliyah. The educational enrolment ratio for Pekanbaru City and Siak Regency is detailed in Table 4.13 below.

Table 4.13 : Net Enrolment Ratio within Siak Regency and Pekanbaru City (2015 – 2017)

District / City	Elementary School / Madrasah			Middle School / Ibtidaiyah			High School / Vocational School		
	2015	2016	2017	2015	2016	2017	2015	2016	2017
Siak Regency	93.03	97.48	100	79.91	78.73	78.33	78.26	71.83	70.89
Pekanbaru City	94.25	95.88	94.5	77.01	70.88	71.93	69.18	70.84	70.51
Riau Province	96.63	96.74	97.08	78.22	78.53	78.87	62.6	62.76	63.02

Source: Accountability Report of Pekanbaru Mayor and Siak District Head (2018)

In general, Siak Regency has a higher net enrolment ratio for elementary school, secondary school and high school compared to Pekanbaru City. The schools in Siak Regency consist of public schools and private schools with some schools under Ministry of Religion.

As detailed in Table 4.13 above, almost all school children are enrolled in elementary school. In contrast, around 20% of middle school students in Siak Regency and 30% in Pekanbaru City did not continue to high school. A similar trend is shown for high school students. Riau Province has a lower net enrolment ratio for high school

students than Pekanbaru City and Siak Regency. It is not known why Pekanbaru City educational enrolment is lower at elementary and middle school level compared to other areas in Riau Province.

Data on the number of schools, the number of students and teachers throughout the Tenayan Raya, Koto Gasib and Tualang Sub-Districts where the nine villages within the Project AoI are located can be seen in Table 4.14 below.

Table 4.14 : Number of Schools, Students and Teachers in Sub-Districts of Tenayan Raya, Tualang and Koto Gasib

Sub-District	Elementary	Madrasah	Middle School	Tsanawiyah	High School	Aliyah
Tenayan Raya Sub-District						
Schools	35	4	2	7	6	4
Students	13,529	951	21	1,689	3,298	1,138
Teachers	636	48	16	140	223	60
Ratio of Students to Teachers (%)	21.27	19.81	1.62	12.06	14.79	18.97
Tualang Sub-District						
Schools	33	4	19	2	12	1
Students	17,226	922	1,534	155	5,712	84
Teachers	806	41	376	18	314	8
Ratio of Students to Teachers (%)	19	12.67	17	9	16	11
Koto Gasib Sub-District						
Schools	18	0	5	3	2	1
Students	3,256	0	938	307	627	74
Teachers	212	0	47	16	42	14
Ratio of Students to Teachers (%)	15	0	10.2	18	14	7

Source: Accountability Report of Pekanbaru Mayor and Siak District Head (2018)

The data presented above shows that Koto Gasib Sub-District has the lowest number of schools, students and teachers. All the Sub-Districts, show a reasonable balance of students to teachers with a ratio of between 1.6 to 19.81%. However, in many cases absence of teachers and head of schools can be an issues in Indonesia. A restricted number of high schools can be a problem if high schools are not well distributed.

Using data from the social survey conducted along the gas pipeline route, Table 4.15 provides an overview of educational facilities for each of the five villages.

Table 4.15 : Educational Facilities for Villages along the Gas Pipeline Route

Villages / Kelurahan	Nursery	Elementary School	Junior High School	High School
Kuala Gasib	2 Puteri Kaca Mayang	1 (state) SDN 01 Kuala Gasib	1 (state)	-

Villages / Kelurahan	Nursery	Elementary School	Junior High School	High School
Pinang Sebatang	1	2 (private) SDN	1 (state)	-
Tualang Timur	1	1 (state) SDN 10 Tualang	1 (state) SMPN 02 Tualang	-
Maredan	2	2 (private)	2 (private)	(1 (state)
Melebung	-	1 (state)	-	-

For the five villages along the gas pipeline route, only Maredan Village has a high school facility. Four villages have secondary school facilities and all villages have primary school facilities. With the exception of Melebung Village, all villages have one or two nursery schools. Melebung Village has only one elementary school. The issue facing the education facilities along the gas pipeline route includes the need for clean water for school sanitation facilities, books for the library and a laboratory to practice their subjects such as physics and chemistry for junior high school students. The schools consist of state and private schools.

The excerpt shown below provides an overview of a woman initiative in developing education programmes in the village of Tualang Timur which is located along the gas pipeline route.

"Building the first school in Tualang Timur Village: from eight students in 1989 to 400 students in 2018

Mrs. Khatanah and her family moved to Tualang Timur Village in 1989. At that time, the population of this village was only 15 households. In 2018, the population has increased into 150 households. Mrs. Khatanah start to run this elementary school from 1990, named SD Negeri 10 Tualang with only eight students and two teachers, Mrs. Khatanah herself and her husband.

Up to February 2018, the school has obtained 400 students and 28 teachers. Eighty percent of students come from the palm oil plantation settlements, mostly the children of palm oil workers. The palm oil plantation company provides a bus for their workers' children to go to school and return to their homes. This company also assists to renovate the school facilities and to fund some school activities. Most students continue their education to junior high school that is located not very far from the elementary school. This elementary school provides books and uniforms for poor students. The students don't have to pay any fees to study in this school.

Mrs. Khatanah is proud of SD Negeri 10 Tualang and villagers respect her as a woman who tries to improve education situation in Tualang Timur Village, Siak Regency."

4.14 Health Profile

Pekanbaru City and Siak Regency Health facilities are important for the Project for the following reasons:

- If there are any major health accidents and illnesses with construction workers, these health facilities can be the first option for medication;
- Health facilities can assist the Project to deal with first aid actions in and around the Project;
- Health resources can assist the Project to inform employees on what major illnesses in the area and how to prevent them. They can also provide awareness for villages in and around the Project area on the potential major health issues arising from the type of industry MRPR are looking to develop; and
- The Project can collaborate with health facilities as part of Corporate Social Responsibility (CSR) on how to strengthen awareness among villagers on how to mitigate major illnesses, reduce maternal-children and baby mortality ratio.

Health facilities within Pekanbaru City comprise state-owned and private which include military health services. Pekanbaru City has 21 hospitals, 20 health centres (puskesmas) at city level, 34 health centres at village level

including six maternal hospitals and 137 private health clinics. Private health services employ specialist medical doctors, general practitioners, midwives and nurses but not dentists and dental nurses. Siak Regency has only one local hospital and 14 health centres for all Sub-Districts and only the local government as a service provider.

The number and types of health personnel in Pekanbaru City are presented in Table 4.16 below. Total number for Siak Regency is also presented; however, types of personnel are not available.

Table 4.16 : Health Services Personnel within Pekanbaru City and Siak Regency (2015)

Types	Pekanbaru City (2015)				Siak Regency (2015)
	State	Private	Military	Total	Total
Specialist Medical Doctor	111	483	19	613	20
General Practitioner	131	203	23	357	78
Dentist	54	43	11	108	25
Midwives	253	470	36	759	367
Nurses	837	1445	109	2391	509
Dental Nurses	35	10	7	52	29

Source: BPS Pekanbaru City (2015); BPS Siak Regency (2015)

Based on the data presented in the table above, Pekanbaru City in terms of facilities and health personnel, has significantly greater numbers and resources than Siak Regency.

Using Tenayan Raya Sub-District health centre data there are five major reported illnesses in the community including: infection of the upper respiratory system, skin diseases, diarrhoea, hypertension and diabetes. These findings are important in considering possible future company intervention related to CSR or initiatives related to health. The number of cases in 2016 for Tenayan Raya Sub-District for each disease in detailed in Table 4.17 below.

Table 4.17 : Major Illnesses at Tenayan Raya Sub-District Health Centre (2016)

Diseases	Number of Cases
Infection of Upper Respiratory	2,564
Skin diseases	1,045
Diarrhoea	841
Hypertension	428
Diabetes	423

Source: Tenayan Raya Sub-District (2018)

Infection of the upper respiratory system is the most common illness. Skin diseases are most likely related to access and availability of clean water facilities and hypertension and diabetes are likely related to life style choices.

Data collected during the social survey on health facilities, health personnel and diseases/illnesses treated between January and July 2017 for villages with the Project AoI is detailed in Table 4.18 below.

Table 4.18 : Health Facilities, Health Personnel, Type of Diseases/Illnesses and Number of Cases for Villages within Project AoI

Village	Health Facilities	Health Personnel	Type of Disease/Illness and Number of Cases from January – July 2017
Kuala Gasib	1 health clinic, 1 health post	1 midwife, 1 nurse	Flu (358), Infection of, Gastritis (236), Rheumatic (206), trauma (161), hypertension (115), diarrhoea (90), dysentery (45).
Meredan	1 health clinic, 1 health post, 1 health centre (posyandu)	6 midwives	Flu (624), skin disease (270), trauma (144), ISPA (101), gastritis (100), diarrhoea (59), hypertension (38) and eyes (29).
Melebung	1 health clinic	1 midwife	ISPA (350), hypertension (255), diabetes (154), fever (97), skin infection (93), gastritis (86), pulpae (72), dysentery (68), diarrhoea (66), dermatosis (553).
Pinang Sebatang	1 health clinic, 1 health post, 10 health centres (posyandu)	3 medical doctors, 2 midwives	ISPA (152), skin infection (32), mental illnesses (27), gastritis (26), trauma (25), diarrhoea (19), flu (18), carried teeth (15), rheumatic (14), hypertension (1).
Tualang Timur	No health clinic, one health post	1 midwife	ISPA (274), Rheumatic (159), flu (147), skin infection (123), gastritis (105), trauma (91), diarrhoea (86), myalgia (85), eyes (63), toothache (60).
Tuah Negeri	No health clinic, 7 health posts	no medical personnel	Since these three *kelurahans* are new administrative areas data is not available at this level. For further information at Sub-District level refer to Table 4.17 above.
Industri Tenayan	No health clinic, 2 health posts	no medical personnel	
Bencah Lesung	1 health clinic, 10 health posts	1 nurse	
Okura	1 health clinic, 6 health posts	1 nurse	**Data for one month only.** Upper respiratory system Infection (13), fever (9), hypertension (6), coughing (4), anorexia (4), arthritis (3).

As outlined in the table above, the villages of Tualang Timur, Industri Tenayan and Bencah Lesung do not have at least health clinics. Tuah Negeri and Industri Tenayan have no health personnel, which is probably because these villages are new administration areas and are very sparsely populated. Pinang Sebatang Village has three general practitioners and Meredan Village has six midwives. Common illnesses in these villages comprise: infection of upper respiratory system (ISPA), hypertension, diarrhoea, dysentery and skin diseases.

The other major health issue in the area is HIV/AIDS incidents. In Pekanbaru City, HIV/AIDS patients are increasing in number. In 2014, there were only 533 cases of HIV and 537 cases of AIDS patients. However, in 2016 the number increased significantly to 1,159 cases of HIV patients and 1,006 of AIDS patients (BPS Pekanbaru, 2015). In addition, there are 62 cases of neonatal mortality in the Pekanbaru City area.

4.15 Community Facilities and Utilities

4.15.1 Clean Water Facilities

Based on the Pekanbaru City Mayor's Performance Achievement Report (2016), clean drinking water is available to 74.77% of the city's inhabitants. Wells are also used to obtain water and there are still some areas where the river is used for washing and bathing. Most people from the three administrative areas in and around the power plant site near Pekanbaru City collect fresh water from PDAM (Water Supply Company), however some of them still need to buy fresh water.

In comparison, 50% of Siak Regency' communities have to buy drinking water and they use the Siak River for bathing (BPS Siak District, 2016). However, the river is polluted from various sources including palm oil waste and as a result the water quality of Siak River is very poor (refer to ESIA Volume 2: EIA for water quality results at points adjacent to the Project area). The water intake and discharge pipelines are located in the Melebung and part of Maredan PDAM. Other areas still use well water and most villagers of Kuala Gasib, Pinang Sebatang, Maredan, Tualang Timur Villages buy gallon water for drinking purposes.

4.15.2 Sanitation Facilities

Pekanbaru City waste disposal service covers approximately 58.45% of the area. In contrast, Siak Regency sanitation facility services cover 95.7% of the area, which at a national level is very high. Many villagers in the three villages/kelurahans near the power plant site have sanitation facilities within their properties while others use communal toilets in the villages. The social survey identified that 88% of the respondents have sanitation facilities at home, 7% of them use the Siak River for sanitation means, 3% use public toilets and the remainder use the gutter or any available places including Siak River (2%).

4.15.3 Waste

Domestic liquid waste such as water from the bathroom or dish water is disposed to the backyard. The waste is left to be absorbed by the land. The social survey identified that, 48% respondents dispose liquid waste to the gutter, 36% dispose it to the septic tank, 11% to any available places and 5% dispose it to the Siak River.

The social survey also identified that 96% of respondents dispose of solid waste through incineration, 3% dispose it to any available places, 1% take it to a waste disposal facility and 1% dispose to the Siak River.

4.15.4 Telecommunication

Many villagers within the Project AoI have cellular phones with Telkomsel being the service provider; however, not all locations have good signals.

4.15.5 Electricity

Based on Pekanbaru City Mayor's Performance Achievement Report (2016), 263,192 households had electricity or almost all of Pekanbaru households. In comparison in Siak Regency in 2015, 68.3% of households had access to electricity, about 20% use non-state electricity facilities and around 10% do not have electricity. Based on the social survey, the three administrative areas of Bencah Lesung, Industri Tenayan and Tuah Negeri have access to electricity supplied by PLN while some of villagers have to use diesel power generators, pay to use their neighbours power or the head of the kelurahans.

The villages along the gas pipeline route do not have access to electricity, with the exception of Kuala Gasib Village where approximately 50% of households have had electricity since January 2018. As of January 2018 electrification hasn't reached Meredan Village, Pinang Sebatang Village and Tualang Timur Village. Most of the villagers are still using diesel power generators and some of them still use oil lamps.

4.16 Quality of Life

The Human Development Index (HDI) is used as a standard to measure the quality of life. The measurement includes indicators for a long and healthy life, knowledge attainment and decent standard of living. An overview of the HDI between 2010 – 2016 for all districts in Riau Province is detailed in Table 4.19 below.

Table 4.19 : Human Development Index for Riau Province (2010 – 2016)

District / City	2010	2011	2012	2013	2014	2015	2016
Kuantan Singingi	65.07	65.72	66.31	66.65	67.47	68.32	68.66
Indragiri Hulu	65.1	65.93	66.5	66.68	67.11	68	68.67
Indragiri Hilir	61.98	62.82	63.04	63.44	63.8	64.8	65.35
Pelalawan	65.95	66.58	67.25	68.29	68.67	69.82	70.21
Siak	69.78	70.2	70.45	70.84	71.45	72.17	72.7
Kampar	68.62	69.64	70.08	70.46	70.72	71.28	71.39
Rokan Hulu	63.59	64.2	64.99	66.07	67.02	67.29	67.86
Bengkalis	69.29	69.72	70.26	70.6	70.84	71.29	71.98
Rokan Hilir	64.13	64.76	65.09	65.46	66.22	66.81	67.52
Kepulauan Meranti	59.71	60.38	61.49	62.53	62.91	63.25	63.9
Pekanbaru	77.34	77.71	77.94	78.16	78.42	79.32	79.69
Dumai	69.55	70.43	71.07	71.59	71.86	72.2	72.96
Riau Province	**68.65**	**68.9**	**69.15**	**69.91**	**70.33**	**70.84**	**71.2**

Source: BPS Provinsi Riau (2017)

Based on data outlined in the table above, the HDI for all districts/cities in Riau Province has increased from 2010 to 2016. Pekanbaru City has an HDI of 79.69 and Siak Regency 72.7 in 2016. The Siak Regency HDI of 72.7 is the third highest in Riau Province after Pekanbaru City and Dumai.

In Indonesia, Pekanbaru City is in a high HDI group but has a lower figure in comparison with DKI Jakarta (79.7), South Jakarta (83.94) the highest in Indonesia, Central Jakarta (80.34) and Padang (81.06). Siak Regency has a medium to high HDI range.

In comparison to other parts of the world, Indonesia is classified a Medium Country category with an HDI of 68.9, compared to Norway, the highest HDI country in the world which has a HDI index of 94.9.

4.17 Vulnerability

ADB defines a vulnerable group as, "*unlike mainstream groups, these groups are typically socially excluded, frequently disadvantaged by discriminatory practices, and limited in their capacity to access or take advantage of development opportunities because of their social characteristics.*"

IFC defines vulnerability as "*people who by virtue of gender, ethnicity, age, physical or mental disability, economic disadvantage or social status may be more adversely affected than others.*"

Groups that are vulnerable in the villages within the Project AoI are generally the elderly, widows and the disabled. One distinct ethnic group that is vulnerable is the Nias people. They migrated to this areas because of a tsunami in 2004. Most have limited skills and are uneducated and many of them do not have identity cards. This means that their children cannot obtain access to free education of the state conditional cash transfer scheme, a national scheme to provide cash benefits to poor women who have children who attend schools.

The Okura people are also considered as vulnerable since their livelihood depends on the quality of natural resources. Men and women use the Siak River for their livelihood, for fishing, bathing and drinking water.

Some of the palm oil worker settlements in the middle of the palm oil plantation areas such as in Melebung Village are considered vulnerable as well. The village of Melebung consists of 30 families and given they live far from larger settlement areas, access to education and health services for their family members is limited, which means that their accommodation and clean water conditions are sometimes compromised.

5. Stakeholder Engagement

5.1 Stakeholder Engagement Plan

A process of identifying relevant stakeholders that may be directly or indirectly affected by the project has been completed. A Stakeholder Engagement Plan (SEP) has been prepared for the Project to guide engagement activities for the Project. The SEP can be found in ESIA Volume 5: Technical Appendices. The objectives of this SEP are to:

- Identify the local legal framework of consultation activities and disclosure requirements, particularly in respect of those public consultation activities that are directly required under the local permitting process;
- Identify potential stakeholders in the area of influence, as well as relevant interested parties such as government agencies and other key stakeholders;
- Record all consultation activities, including those prior to the commencement of the ESIA process;
- Describe how concerns or grievances will be handled via a Grievance Mechanism (refer to mitigation and monitoring Sections 8.1 and 8.2 of the SIA);
- Provide an action plan for further consultation including at least two meetings bi-annually in each affected community during preparation, construction and operational phases of the Project, including details on appropriate formats for effective and culturally meaningful interaction with the community and relevant stakeholders; and
- Provide a disclosure plan, including the identification of any locations where relevant project documentation will be available locally and elsewhere as well as languages to be used.

The SEP will be revised and updated periodically including upon completion of the ESIA to assist with ongoing engagement throughout the Project. A copy of the SEP which includes the Grievance Mechanism is provided in Volume 5 – Technical Appendices.

5.2 Public Engagement to Date

5.2.1 Public Meetings

The first public consultation for the Project was conducted on 11th October 2016 and was attended by 78 participants including 11 women, 2 non-governmental organisations (NGO) and a University of Riau lecturer in Kelurahan Bencah Lesung Office, see Figure 5.1 below.

Suggestions from the communities for the Project include:

- Expectation that the MRPR improve the bridge at Tenayan Jaya road;
- Based on community experiences from similar Project development activities, many community members did not know the route of the gas pipeline. They hoped that signs will be produced indicating where the pipeline route is located;
- Would like to see local community members being employed. They want to ensure the bad practices of Tenayan CFPP who only employed three villagers as security officers will not be followed.
- In order to formulate CSR activities, it is hoped that the MRPR Community Liaison Officer will discuss proposals with Sub-District and District Government Officers in order to fulfil the needs and aspirations of the villagers.
- The MRPR project office should be accessible to local communities in order to build good relationships

- Villagers would like to know what impact the power plant will have on the palm oil plantations surrounding the site.
- Improve the condition of roads used to transport heavy equipment to the power plant site.
- MRPR to conduct training to improve the capacity building of local human resources.
- Women to have the opportunity to apply for jobs.

MRPRs representative responded to all questions and queries raised by the community at the meeting and noted that any concerns will be considered a priority. MRPR Community Liaison Officer will also continue to discuss any further issues raised by the villagers.

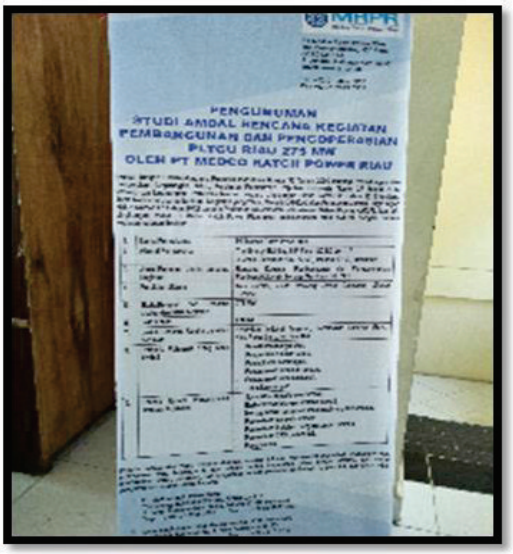

Figure 5.1 : Public Consultation Board used in Meetings with the Community

5.2.2 Progress to Date

MRPRs Community Liaison Officer have visited most of the villages around the power plant and along the gas pipeline in order to maintain communications and provide ongoing information related to the Project.

During the lender's visit on the 11th – 15th of December 2017, two community member meetings at two locations along the gas pipeline and one meeting in the office of Kelurahan Tenayan Raya were conducted. A social survey of Tuah Negeri, Bencah Lesing and Industri Tenayan Villages adjacent to the power plant and the five villages along the gas pipeline route Kuala Gasib, Pinang Sebatang, Meredan, Tualang Timur and Melebung was conducted by NBC. During the social surveys any community concerns in relation to the Project were recorded. Figure 5.2 below shows the public consultation event undertaken at Industri Tenayan Kelurahan.

Figure 5.2 : Public Consultation at Industri Tenayan Kelurahan

5.3 Community Perceptions of the Project

From the social survey conducted at the power plant approximately 60% of respondents in Tuah Negeri, 70% of respondents in Bencah Lesung and 40% of respondents in the Industri Tenayan administrative areas did not know about the power plant development. However, when the goals of the project were explained, the majority of respondents seemed in favour of the Project as it would provide benefit to local communities. The respondents who were not in favour cited a lack of clarity concerning benefits and fear of environmental impacts.

Based on the social survey along the gas pipeline route, approximately 45% of the respondents were aware of the Project. An estimated 32% of the respondents confirmed knowledge of the Project from the power plant employees, 9% respondents knew the Project from their friends, and 2% of the respondents knew the Project from the village or Sub-District officers. Only 1% of the respondents knew the Project from the Sub-District officers. Approximately 96% respondents along the gas pipeline route approved of the project.

Community concerns and suggestions in relation to the Project which were raised by respondents during social surveys are detailed in Table 5.1 below along with how the ESIA will address these concerns and suggestions.

Table 5.1 : Community Concerns / Suggestions raised during Social Survey and how the ESIA Addresses them

Community Concerns / Suggestions	How the ESIA has Addressed the Concerns / Suggestions
They are afraid that the project might impose danger to the nearby settlement.	The ESIA assesses the potential environmental and social impacts from the Project and recommends mitigation measures to reduce any significant impacts identified that are not already addressed through the design of the Project.
They disapprove of cutting down their privately-owned trees. They want MRPR to request the village official's permission and to act respectively in the village.	Any vegetation required to be removed will be noted in the ESIA and in the Analisis Mengenai Dampak Lingkungan (AMDAL) which will require approval prior to work commencing. Ongoing community engagement will be conducted through MRPR's Community Liaison Officer and any community concerns

Community Concerns / Suggestions	How the ESIA has Addressed the Concerns / Suggestions
	identified will be addressed.
They demanded appropriate compensation for their loss and refused to be dislocated if the Project development trespasses their private territory.	MRPR is addressing this through the land acquisition process on a case by case basis. Any compensation would be dealt with through a Livelihood Restoration Plan (LRP).
They demanded for MRPR to be honest and to bring benefit to the public.	MRPR will be honest and open about all matters relating to the Project that may impact on local communities. Ongoing community engagement will be conducted through MRPR's Community Liaison Officer and any community concerns identified will be addressed.
They demanded for MRPR to confirm to the village officials regarding any issues, and not to take personal gains, and not to lie to them.	
There should be an announcement and meeting with the villagers about the impact and benefits of the Project.	Following completion of the ESIA, a meeting will be conducted with the local communities to communicate the findings of the ESIA.
There should be precaution measures to the gas pipeline and prevention of black out.	The gas pipeline will be designed to avoid any impacts to the local communities including for example being trenched and buried. The transmission and distribution of power are the responsibility of PT Perusahaan Listrik Negara (Persero) (PLN). The power station will contribute to the security of supply in the region and so help prevent black outs.
The presence of the gas pipeline for generating electricity should guarantee availability of electricity in the village.	The distribution of electricity generated by the Project will be determined by PLN.
There should be job opportunities for the villagers.	MRPR will seek to employ members of the local community as far as possible. There will be approximately 60 permanent employees at the power plant, and others will be required to assist with maintenance from time to time. The local community and villagers will be encouraged to apply for jobs at the power plant and suitably qualified applicants will be hired where appropriate.
There should be a significant approach to help the villagers. The Project authority should provide support to the villagers during the development of the Project.	MRPR will ensure that local communities are supported through ongoing consultation with MRPR's Community Liaison Officer and through MRPRs CSR programs.
The construction of the Project should not trespass on the villagers' settlement and they should avoid disrupting the public facilities.	The power station, transmission line and water pipelines are not close to any current settlements. The gas pipeline route will pass through several villages and settlements, but any disruption will be temporary, during construction. Where the gas pipeline design cannot be altered to avoid existing structures, MRPR will address any issues through the land acquisition process on a case by case basis. Any compensation would be dealt with through a LRP.
The Project should ensure safety and assist villages' public facilities such as electricity and freshwater.	MRPR and their Engineering Procurement Construction (EPC) Contractors will ensure public health and safety is maintained via management plans. The provision of electricity and water to villages is not MRPR's responsibility. However, the power plant will contribute to the security of supply in the region.
There should be fair compensation and secrecy of personal data.	MRPR will ensure any compensation necessary is fair and that any data disclosed by the local communities is kept securely.

Community Concerns / Suggestions	How the ESIA has Addressed the Concerns / Suggestions
MRPR has to be responsible for any problems that may occur as a result of the Project and provide early warning before disrupting the villagers.	Ongoing community engagement will be conducted through MRPR's Community Liaison Officer and any community concerns identified will be addressed.
MRPR should be aware of the economic conditions of people in the plantation. Many are poor and some are elderly.	This SIA highlights the economic conditions of the local communities within the Project AoI and any potential impacts to vulnerable people will be avoided or mitigated as far as possible.
The gas pipeline should be monitored on monthly basis.	MRPR will ensure appropriate maintenance of Project facilities including the gas pipeline are conducted on a regular basis.

6. Social Impact Assessment

6.1 Employment

The Project will create a range of direct and indirect employment opportunities during construction and operation. These are discussed in further detail below.

6.1.1 Direct Employment

Labour requirements will fluctuate throughout the 3-year construction period. According to construction labour estimates the following:

- Construction workforces will peak at approximately 956 workers for the power plant and 299 workers for the gas pipeline;
- The power plant construction will generate over 10,000 man-months of labour; and
- The gas pipeline construction will generate over 2,200 man-months of labour.

It is anticipated that many of those will be employed from the local communities in the immediate Project area. However, a number of roles will require specialist skills and/or further education and may require sourcing from Pekanbaru City or further afield.

During operation, a total of 62 individuals will be employed, with only one of these anticipated to be sourced from overseas. All others are expected to be from Indonesia, and it is expected that many will be drawn from the current workforce in the Pekanbaru area.

The station operational workforce will require a mix of senior managers, supervisors, operations staff, maintenance staff, and clerical support. The proposed organisational structure is provided in ESIA Volume 5 – Technical Appendices, Appendix G of the Process Description. It is anticipated that appropriately qualified individuals from the immediate local communities will be employed in some of these roles.

Potential Beneficial Impacts

As identified in Section 4.12.1, a large proportion of local communities within the Project AoI have low incomes and can be considered to be of Medium sensitivity (refer to Sensitivity criteria in Table 3.2). Direct employment is anticipated to generate a number of jobs for the local community that will continue over a number of years both during construction and operation. This can be considered to be of Moderate magnitude. Direct employment opportunities are therefore anticipated to be of **Moderate** beneficial impact.

Potential Negative Impacts

If the Project employs workers from outside the villages located within the Project AoI it may lead to conflict, especially if the villagers feel that resources are not properly being dedicated to building the capacity of local villagers.

The proposed EPC Contractor for the power plant is Lotte Engineering and Construction (Lotte) who are from South Korea. Lotte's approach may not be sensitive to the local culture and religion. However, it should be noted that Lotte does have prior and current experience working in Indonesia and will therefore be experienced in managing any local cultural differences. The gas pipeline Contractor is Citra Panji Manunggal (CPM), an Indonesian company which has significant experience working through the country.

Although employment of locals from villages within the Project AoI will occur, additional employment will occur from further afield. It is likely that many villagers may not qualify for some of the operational jobs as the criteria

for these positions can include advanced education and specialist skills. However, there will be many positions where technical expertise is not required.

Any potential impacts arising from conflict associated with employment of individuals outside the Project AoI or from cultural differences of the EPC Contractor is considered to be of Minor magnitude. With sensitivity considered to be Medium, overall impacts are determined to be **Minor**.

6.1.2 Indirect Employment

In addition to direct employment, the Project will require goods and services throughout the construction period. These would generate indirect employment opportunities through additional business for local companies. For example, catering meals for workers, providing construction equipment, cleaning services, car rental services, security services and small maintenance jobs.

During operation, local businesses could further expand to provide better quality services and support other projects in Pekanbaru City. The Project may then provide a foundation for developing sustainable local businesses. Increased indirect opportunities for local businesses is considered to be of Minor magnitude. In consideration of existing employment sensitivity discussed in Section 6.1.1 above overall impacts to the Project from indirect employment is determined to be of **Minor** beneficial impact.

6.2 Land Acquisition Impacts

6.2.1 Land Acquisition

Land acquisition will be carried out through prior consultation with land owners and local government representatives and this process is still ongoing.

Land owners and land users will be compensated as appropriate and their needs addressed in line with IFC Performance Standard 5 and ADB Social Safeguards. Land acquisition for the Project will be conducted on a willing-seller willing-buyer basis, at no point will the Indonesian Government's expropriation powers under Law No. 2/2012 on Land Procurement for Development in the Public Interest will be used to acquire land for the Project. In other words, land acquisition will be based on mutual agreement and costs identified by land/agriculture valuation experts and local government institutions. Compensation will be provided based on market value for land and if required for replacement value of affected assets, even when government rates issued by the regional government are lower. Based on this there will be no involuntary resettlement.

The compensation and voluntary resettlement process will take into account livelihood restoration, quality of life, and especially, compensation for vulnerable villagers. This means that cash compensation is not always the best alternative as it can be spent quickly. Replacement land with easy access and similar or better quality can often be a better option. Placement of the power plant and re-routing of the gas pipeline and water intake and discharge pipelines have been selected to reduce the potential level of conflict that the land acquisition process can generate. All site and route considerations are discussed in the assessment of alternatives section of ESIA Volume 1: Introduction.

In line with the national voluntary resettlement process, set out below are the stages of the Land Acquisition Process that will be completed for the Project by MRPR.

Land Acquisition Process

The land acquisition process is divided into two main areas, one being the power plant and transmission line and the other the gas pipeline route. Figure 6.1 below provides an overview of the land acquisition flow chart for the power plant and transmission line and Figure 6.2 provides a flow chart for the gas pipeline. The land acquisition process being followed by MRPR for the Project is detailed in the following points below.

1) MRPR personnel (legal, technical, HSE) has conducted a preliminary survey to identify the land and collect all related information from the field (data on land owners, width etc).

2) The targeted plots of land for the power plant area consist of 12 parcels of land currently used as palm oil plantation. Based on collected data, the plots of land are owned by ±6 individual farmers and are located away from dense residential areas. The total area of land to be acquired is approximately 92,575.52 m^2, with ±24,800 m^2 allocated for the power plant, ±12,800 m^2 allocated for special facilities, and the remaining area allocated for office buildings and other supporting facilities. Based on discussions with the following authorities on 6th February and 2nd March 2018:

   - Pekanbaru City administration and joint meeting with The Ministry of Agraria and Spatial Planning;
   - Pekanbaru City;
   - Siak Regency; and
   - Riau Province.

   MRPR understands that the area of the target plot will be designated for industrial and commercial area.

3) To date, MRPR has obtained a form of commitment from the 6 landowners to sell their land to MRPR. However, the purchase of the target plot by MRPR is subject to issuance of a Location Permit ("Ijin Lokasi") from the local government of Pekanbaru City. As the capital of Riau Province, the issuance of the location permit by the Pekanbaru City administration is subject to and in line with the Riau Province Spatial Plan (Rencana Tata Ruang dan Wilayah (RTRW). At the time of writing this ESIA, the Location Permit is yet to be issued to MRPR.

4) The negotiation process with land owners may be conducted more than once; it will depend on the situation in the field. MRPR has engaged a firm to independently appraise the value of the land within the power plant. It is expected that the negotiation with land owners could be concluded with the final price equal to or higher than the value assessed final report of independent appraisal which hired earlier by MRPR.

5) MRPR shall collect the required documents from the land owners to be reviewed by the Notary. If the Notary declares the documentation insufficient then MRPR's team will communicate with the relevant land owners, Heads of Village, and Heads of Sub-district concerning any incomplete and missing documents.

6) MRPR are in the process of collecting the required evidence for ownership of the target land. MRPR has requested that the land owners provide send this evidence direct to the Land Deed Official at Pekanbaru City for review. If the Land Deed Official determines that further evidence is required, then MRPR will communicate with land owners, Head of Village, Head of Sub-District to obtain the required documents.

7) Based on legal advice MRPR has received, the land that MRPR is targeting is unregistered land ("SKGR") and these normally have some legal risk. The legal risks are common in the Pekanbaru area because the SKGR documentation practices in the Village/Kelurahan Office are not as rigorous as the documentation practices which are implemented elsewhere in Indonesia e.g. by the Villages/Kelurahan Offices in Java Island for Girik land. Therefore, it is possible that each land target may have more than one set of legal documents and so potentially more than one person claiming ownership of that land.

8) Since the finalisation of the Zoning Plan of Riau Province is unpredictable and MRPR also need to minimise the legal risks then MRPR will follow the following process:

   - MRPR and the land owner will sign the Engagement Agreement of Land Purchase ("PPJB") after which MRPR will transfer the Down Payment to the land owner. Also, the land owner will sign the Power of Attorney to the Notary to process the land transfer certification (individual HGB) to BPN office.

- MRPR will pay the Notary the fee for the land certification process of the individual HGBs.
- The Deed of Land Purchase will be executed after: (i) BPN issued the individual HGB; and (ii) MRPR obtain the location permit.
- MRPR will process the re-registration of the HGB certificate for the land to be listed under the name of MRPR.

MRPR have maintained communication with the relevant authorities at Riau Province and Pekanbaru City to monitor the progress with respect to the RTRW ratification as well as in obtaining confirmation of National Zoning Plan (RTRW) compliance from The Ministry of Agraria and Spatial Planning. On the 6th February and 2nd March 2018, The Ministry of Agraria and Spatial Planning conducted a meeting to discuss compliance with the National Zoning Plan with the relevant authorities from Pekanbaru City, Siak Regency, and Riau Province. A Recommendation Letter on the National RTRW compliance has now been issued by The Ministry of Agraria and Spatial Planning on the 27th March 2018.

9) After the signing date of the deeds and payment to the land owners, the MRPR team will monitor and ensure that the legal documentation process is correctly undertaken.

10) All completed and signed documents will be collected and handed over to the Notary for certification process to BPN.

11) The MRPR team coordinating with the Notary will monitor and follow up the certification process under MRPRs name at the BPN office.

12) Upon completion of land document certification from the BPN, all documents shall be handed over to MRPR.

13) For the gas pipeline, land acquisition will be required for certain parts of the gas pipelines that cross private palm oil plantation area. Approximately 30 km of the gas pipeline will be within existing provincial and regency roads and this will be leased. For the remaining 10 km of the gas pipeline, it will cross private plantation and MRPR will enter into a land use agreement / land acquisition with these land owners. The land acquisition process is ongoing with further surveys and communication with the relevant Local Government being scheduled.

It should be noted that the ESIA does not represent a legal opinion in respect to the land acquisition process being conducted by MRPR.

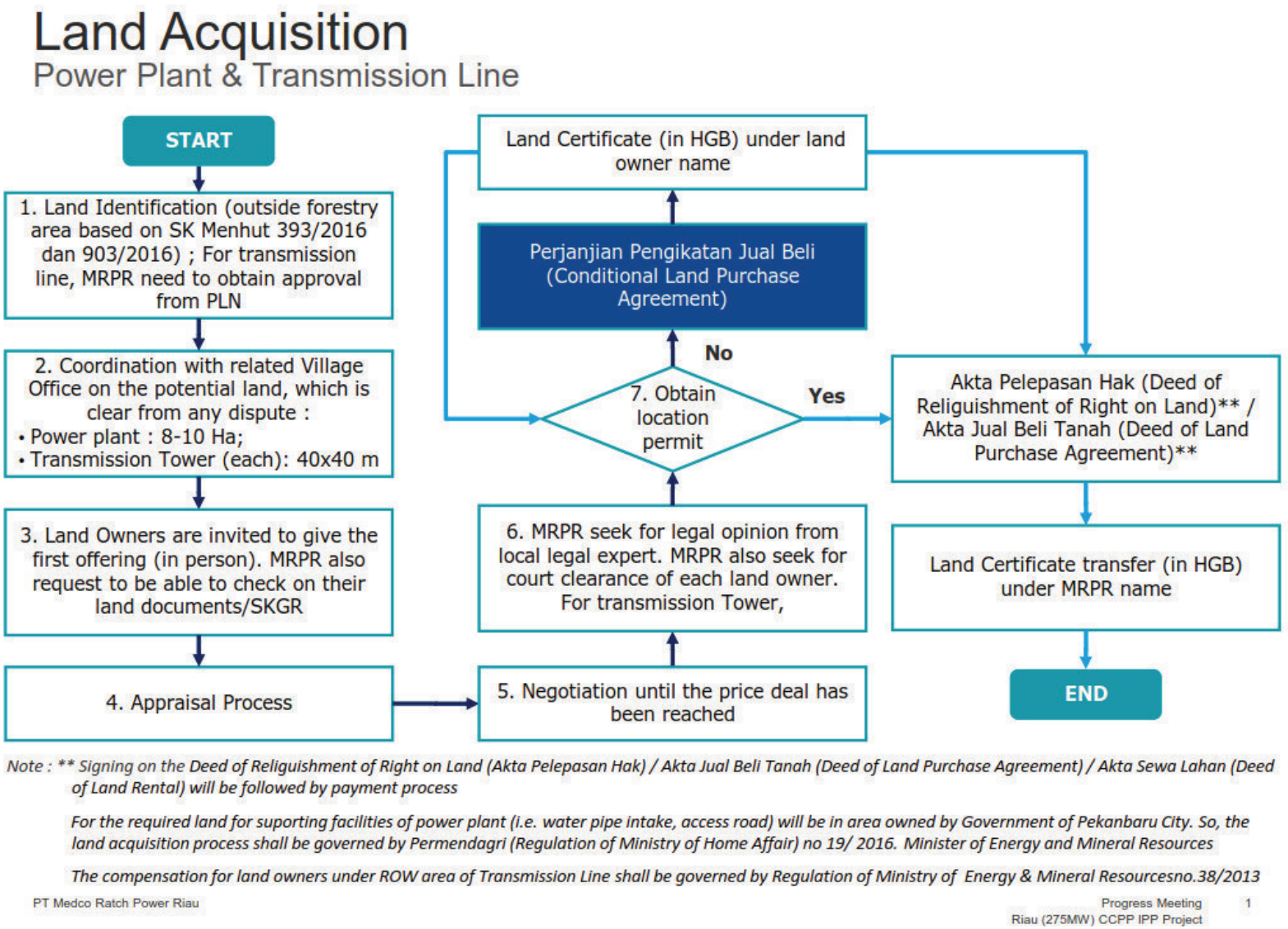

Figure 6.1 : Land Acquisition Flowchart for the Power Plant and Transmission Line

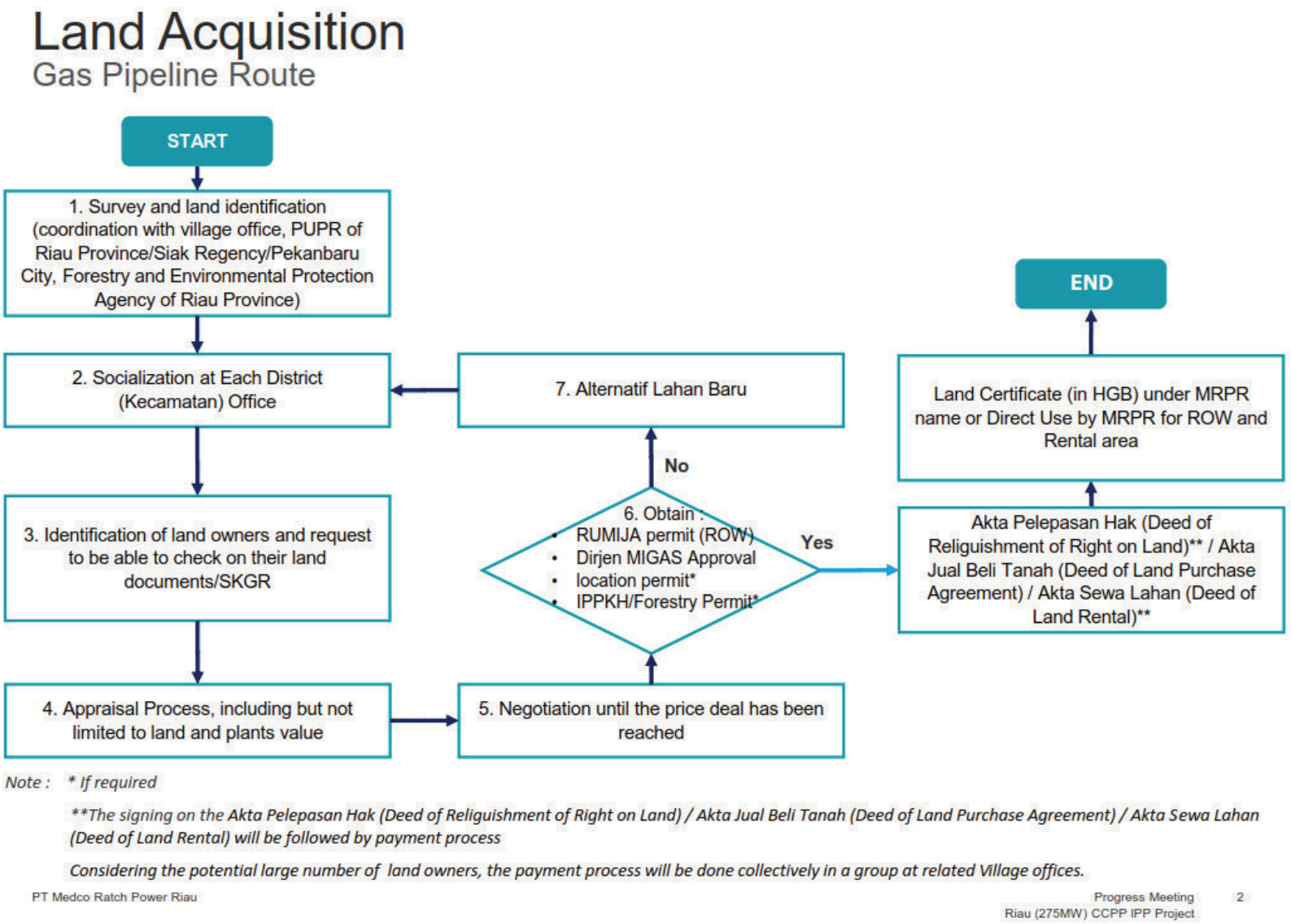

Figure 6.2 : Land Acquisition Flowchart for the Gas Pipeline

6.2.2 Efforts to Avoid or Minimise Displacement

A number of options for placement of the power plant and routing of the water intake and discharge pipeline and gas pipeline have been considered and these options have been discussed further in ESIA Volume 1: Introduction. The preferred options have been selected to avoid, and as far as possible minimise physical and economic displacement to local communities. Any potential impacts in relation to physical and economic displacement are discussed in Sections 6.2.3 and 6.2.4 below.

6.2.3 Physical Displacement Impacts

For the power plant and transmission line, the type of land is palm oil plantations owned by ± 6 individuals consisting of 12 parcels of land for the power plant and two to three individuals consisting of three parcels of land for the transmission line. The power plant and transmission line do not have any people residing on the land and according to the draft Zoning Plan for Riau Province, the area is designated for industrial and commercial use and as such no physical displacement will occur. The baseline surveys identified no persons or structures residing on the proposed power plant site.

The preferred water intake and discharge pipeline route is within government owned land with no permanent residents located nearby and therefore no physical displacement impacts will occur. The temporary jetty is located on the opposite bank of the Siak River to the village of Okura and therefore it will not result in the physical displacement of any villager.

There are five villages along the gas pipeline route which comprise a range of properties which may be affected during construction in a temporary basis. At the proposed gas metering facility location, there are two nearby properties. However, the gas metering facility is located sufficiently far enough away from these properties, therefore it will not result in any physical displacement. An overview of potentially affected properties within each village along the gas pipeline route is provided in Table 6.1 below. It should be noted that the number of properties is based on consideration of Alternate Route 1 as shown in Figure 4.1. Based on a desktop review of properties along the preferred 7 km section of gas pipeline (prior to entering the offtake location), which is now south of the road, the number of properties that may affected will be less than those shown in Table 6.1. Once the final route is confirmed, the numbers of properties to be affected will be outlined in a revised version of the ESIA prior to financial closure.

Table 6.1 : Properties along the Gas Pipeline Route that may be Affected

Village	Types of Properties	Number of Properties along the Gas Pipeline Route	Number of Properties within 0-1 m of the Gas Pipeline
Kuala Gasib	Workshop, welding shop, small kiosk of gasoline (3), health post, houses, a monument of Princess Kaca Mayang cemetery, huts, food stalls/warung (9)	23	12
Pinang Sebatang	Ex Electricity post, small welding shop, houses (12), warungs, boundary post, NGO meeting post.	19	5
Tualang Timur	Garage, houses (19), shop, warungs (32), gasoline kiosk, food stalls, bus stop, school fence, entrance portal	60	8
Maredan	Houses (19), fence of security posts, fence of school, concrete shops, kiosks, garage, warungs (5)	30	1

Village	Types of Properties	Number of Properties along the Gas Pipeline Route	Number of Properties within 0-1 m of the Gas Pipeline
Melebung	Palm oil company worker 's accommodation sites (5), security portal (3) musholla, pipes of PT Kelila, houses, portals	12	7
Tuah Negeri	Houses (3)	3	-
Total		**148**	**33**

As of May 2018, MRPR are still in the process of finalising the gas pipeline route and the intention is to undertake minor re-routing around properties that could be subject to permanent physical displacement. Temporary displacement of warungs (very lightly constructed wooden street stalls which are relatively portable) for example may occur. However, as the pipeline will be constructed 500 m at a time any physical displacement will be for short durations of approximately a week. As such there is no plan to permanently physically displace any villagers along the gas pipeline route.

Some of the individuals in the affected properties may be vulnerable and therefore sensitivity is considered to be Medium. Any physical temporary displacement as a result of the Project is expected to be of Minor magnitude and therefore overall impacts are determined to be **Minor.**

6.2.4 Economic Displacement and Livelihood Impacts

The palm oil plantation within the Project AoI represents a source of income for local communities that work on the land and therefore the removal of palm oil plantation land associated with the Project will impact on their livelihood. At the power plant site there is currently one security guard who is the head of the sub-*kelurahan* who is employed by the plantation owner. The construction of the power plant will directly impact on the livelihood of the security guard and therefore appropriate compensatory measures will need to be put in place by MRPR via a Livelihood Restoration Plan (LRP). Measures may include employment during the construction and operation of the Project or appropriate compensation. As the individual impacted is not considered to be vulnerable, sensitivity is considered to be Low. Only the livelihood of one individual will be impacted from the power plant and therefore magnitude can be considered to be Negligible. Overall livelihood impacts from construction and operation of the power plant and transmission line is determined to be of **Negligible** impact.

At the temporary jetty site, Okura Villagers who are considered vulnerable utilise the Siak River for their livelihood. Notwithstanding the vulnerability of the Okura Villagers, in the context of use of the Siak River which is extremely large and given the size and location of the temporary jetty, sensitivity is considered to be Low. The temporary jetty will be approximately 100 x 70 m in size and therefore will result in the loss of 7,000 m^2 of land. Compared with the total area of the Siak River, this area is extremely small and given the jetty will only be temporary (used during construction), impacts to Okura villagers' livelihood is considered to be of Negligible magnitude. Overall livelihood impacts from the temporary jetty are determined to be of **Negligible** impact significance.

The water intake and discharge pipeline routes are located near to a number of warungs. It is expected that the pipeline can be routed to avoid the warungs however, should this not be possible they will require temporary relocation during construction (expected to take up to eight months) resulting in economic displacement. As warungs are lightly constructed portable structure it is anticipated that they could be moved to outside the area of impact (expected to be tens of metres) during construction and as the pipelines will be buried, the warungs will be able to return to the original sites following completion of construction activities. In addition, the presence of construction workers may result in increased business. As such impacts associated with economic displacement during construction of the water intake and discharge pipeline are considered to be of Minor magnitude. As outlined in Section 4.12.1 income is typically low in the Project AoI and therefore economic

displacement from construction of the water intake and discharge pipelines can be considered to be of Medium sensitivity. Overall impacts are therefore determined to be of **Minor** impact significance.

As outlined in Table 6.1 above, a number of properties have been identified along the gas pipeline route that may be affected during construction. Although no permanent physical displacement is anticipated, businesses such as warungs (food stalls) and kiosks may require temporary re-location. ADB defines a significant impact if 200 or more persons will experience major impacts, which are defined as:

i) Being physically displaced from housing; and

ii) Losing 10% or more of their productive assets (income generating).

Economic displacement is defined by the ADB SPS as loss of land, assets, access to assets, income sources, or means of livelihoods as results of:

i) Involuntary acquisition of land; or

ii) Involuntary restrictions on land use or on access to legally designated parks and protected areas.

It is unlikely that the temporary short-term involuntary restrictions (such as movement of warungs away from the gas pipeline construction area) during gas pipeline construction would result in a major significant impact as defined by ADB. While these impacts are not considered major, MRPR will develop a Livelihood Restoration Plan (LRP) to manage any compensation and livelihood restoration measures that may be necessary.

As discussed in Section 6.2.3 the construction of the gas pipeline will be carried out in 500 m sections that are anticipated to take no more than a week to complete, therefore impacts to livelihood of any affected communities will be small in number (less than 200) and temporary, resulting in Moderate magnitude. It is possible that some of those affected during construction of the gas pipeline may be vulnerable (elderly, widows and disabled) and many members of the community are poor therefore sensitivity is considered to be Medium. Overall impacts to livelihood from construction of the gas pipeline is determined to be of **Moderate** impact significance.

6.2.5 Impacts to Tourism

Within the Project AoI, the village of Kuala Gasib is most likely to be affected by the Project in respect to tourism activities. This is small area in the context of the overall gas pipeline route and therefore tourism can be considered to be of Low sensitivity. The gates of Princess Kaca Mayang cemetery may be impacted as a result of the Project however, pipeline design is ongoing and efforts will be made to re-route where possible. Nuisances such as traffic, noise and dust during the construction phase may discourage interest in the local tourism businesses, though construction activities will last less than a year. Impacts may consist of roadway restrictions during construction that will influence visitors' access to historical sites. As construction of the pipeline will be in 500 m sections that may last up to a week, disruption to any tourism businesses in that section will be of short duration and therefore impacts to areas of tourism interest will be of Negligible magnitude. Overall impacts from the Project on tourism businesses within the Project AoI are anticipated to be of **Negligible** impact.

6.3 Community Health, Safety and Security Impacts

Community safety impacts with respect to the operation of the gas pipeline is discussed in the Qualitative Risk Assessment (QRA) which can be found in ESIA Volume 2 – Environmental Impact Assessment (EIA). The health and safety in relation to those working on the Project is discussed further in the Occupational Health and Safety and Working Conditions assessment report which can be found in ESIA Volume 5 – Technical

Appendices and is also summarised in ESIA Volume 2 – EIA. These sections include procedures and processes for managing emergency incidents that may impact on local communities.

6.3.1 Health

The Project will employ many workers during construction and operation and there is potential therefore, that this may increase the rate of spread of communicable diseases in the Project area. In addition, there is potential for personnel from outside the Project area to be present during construction and operation, which may introduce new diseases and/ or a more virulent strain of an existing disease. Another factor that could influence the prevalence and rates of communicable diseases is the creation of vector habitat for insects during construction and during operations e.g. standing water which may result from certain project activities such as alterations to drainage patterns, establishment of trenches (which can fill with water during rainy periods).

The introduction of the workforce can potentially contribute to an increase in the commercial sex trade in the Project area, especially given that the Project location is close to Pekanbaru City, the capital of Riau Province.

An increase in the commercial sex trade is often associated with large scale developments, particularly when a large (often mainly male) workforce is required for a short period of time. In the case of this Project, at the peak of construction more than 1,000 workers will be employed. If appropriate precautions are not taken, increased rates of communicable diseases in the Project area could occur. This may contribute to increased rates of HIV/AIDS and other sexually transmitted diseases in the local communities.

Therefore, an increase in the transmission of communicable diseases may occur as the result of the introduction of workers into the area, creation of vector habitat, and/ or possibly the presence of commercial sex workers. If left untreated communicable diseases can lead to long-term health issues and/ or in some instances death. In other words, the impact can be characterized as being long-term and in some instances permanent. This could be exacerbated by the fact that few villagers may recognise the symptoms of some diseases.

As the workforce to be introduced will be relatively small against the existing population and the opportunity for creation of vector habitat limited, the magnitude of potential health impacts from the Project is considered to be Minor. There are a number of existing healthcare facilities adjacent to the Project area and Pekabaru City is only 10 km to the west. Therefore, there is good capacity to absorb any increased healthcare demands as a result of the Project. Consequently, sensitivity can be considered to be Low. Overall impacts to health is determined to be of **Negligible** impact.

6.3.2 Safety and Security

Potential safety and security issues for the Project include:

- Waterway impacts to Okura Villagers who use the Siak River as a means of travelling around using traditional boats and canoes e.g. children travelling to school, fishing etc; and
- Impacts on the communities from increased road traffic associated with the delivery of materials and equipment for the project.

During construction equipment and material will be delivered to the Project via the following:

- vessels unloading at the temporary jetty site, which will result in increased river traffic; and
- Trucks, delivering bulk materials and equipment to the power plant site and along the gas pipeline route.

An increase in waterway and roadway traffic as a result of Project activities could increase accidents in the community. As river traffic within the Siak River is already extremely busy with boat movements to Pekanbaru City and to the existing Tenayan CFPP and therefore river traffic associated with the Project is anticipated to be insignificant against existing river traffic levels. For further details on the level of impact on river traffic from the Project, refer to the Traffic Impact Assessment detailed in ESIA Volume 2 – EIA. Consequently, increased safety

and security to the Okura villagers will be of Negligible magnitude. Although the Okura villagers are deemed vulnerable and therefore of Medium sensitivity, overall impacts as determined to be of **Negligible** impact significance.

6.4 Gender Impacts

The construction and operations stages of the Project will result in the employment of a number of people as discussed in Section 6.1 above. Many of the employment positions are for skilled positions that will likely result in a gender bias towards men. This may lead to conflict with women, mainly in the local communities but also potentially further afield such as in Pekanbaru City. However, MRPR has no intention of limiting employment to males. For example, facilities for males and females will be provided in all buildings as MRPR anticipates that many of the permanent operations and maintenance staff will be female.

Indirect employment opportunities resulting from the construction and operation of the Project may contribute to lessening gender bias through increased support to local businesses that employ women. Impacts to gender bias is therefore anticipated to Minor of magnitude. As noted in Section 4.9, there is a pre-existing gender bias towards men particularly in more senior roles within the local communities and therefore sensitivity is considered to be Medium. Overall impacts to gender bias as a result of the Project is determined to be of **Minor** significance.

6.5 Vulnerable Impacts

As outlined in Section 4.17, the following have been identified as vulnerable within the Project AoI:

- Nias people;
- Okura people;
- Melebung Villagers; and
- Elderly, widows and disabled.

Impacts to those identified as vulnerable are mainly in relation to the limited potential temporary economic displacement as discussed in Section 6.2.4. The key impact from economic displacement is in relation to the construction of the gas pipeline which is most at risk of affecting vulnerable people including the elderly, widows and disabled. Impacts to vulnerable including those on low income is determined to be of **Moderate** significance as detailed in Section 6.2.4.

6.6 Education Impacts

As outlined in Table 6.1 above, the construction of the gas pipeline may potentially affect school in the villages of Tualang Timur and Maredan. Schools can be considered a sensitive receptor with limited means to absorb change and therefore sensitivity is considered to be Medium. Physical impacts to the school will be avoided through re-routing of the gas pipeline and should this not be possible would only result in disturbance to the school fence. The construction of the gas pipeline will result in noise which may disrupt ongoing education at these schools. However, as construction of the gas pipeline will be carried out in 500 m sections that will be approximately one week in duration, disruption to educational activities will be temporary and therefore overall impact magnitude is considered to be Negligible. Overall impacts to education from construction of the gas pipeline is determined to be of **Negligible** significance.

Beneficial education impacts may arise through capacity building to the local community in relation to local employment and associated training. As numbers of skilled workers or those with higher education in the area and relevant to the proposed development are likely to be limited (considered to be of Medium sensitivity) any

capacity building is anticipated to be of Minor magnitude. Overall beneficial educational impacts are determined to be of **Minor** significance.

6.7 Ecosystems Services

As outlined in Section 4.11, the use of the Siak River and other smaller rivers as a provisioning service and the use of plants for medicinal purposes are important ecosystem services within the Project AoI.

Components of the Project that are associated with the Siak River include the intake and discharge water pipelines and the temporary jetty. The construction of these structures will result in minimal land take and river traffic will be insignificant against existing river traffic levels. During operation, discharges of water from the site will not impact on the water quality or ecological features of the Siak River (refer to ESIA Volume 2 – EIA, Hydrology and Water Quality and Freshwater Ecology Impact Assessment section). As such the magnitude of impact to ecosystem services associated with the Siak River is considered to be Negligible. The Siak River is a large river with good capacity to absorb proposed changes and therefore it is considered to be of low sensitivity. Overall impacts are determined to be of **Negligible** impact significance.

The power plant, transmission line and water intake and discharge pipelines will be sited within land comprising palm oil plantation and the gas pipeline will predominantly within the reserve of existing road or through palm oil plantation land. The removal of vegetation will therefore predominantly comprise palm oil plantation and is not anticipated to cause any widespread impact on plants that are used for medical purposes. The majority of medicinal plants are understood to already be lost in the area with the majority present only within the confines of properties that have planted them therefore sensitivity is considered to be Negligible. The impact magnitude associated with removal of plants used for medicinal purposes is considered to be Negligible. Overall impacts are therefore determined to be of **Negligible** impact significance.

6.8 Cumulative Impacts

The only other major development in the area is the existing Tenayan CFPP which is located 2 km north of the proposed power plant site. The two projects are not anticipated to cause any adverse cumulative impacts to the local communities in the area. However, ongoing community engagement through MRPR's Community Liaison Officer will be important in understanding and managing any community concerns. The capacity building and employment opportunities associated with the Project will be important considerations to be taken forward.

7. Cultural Heritage

7.1 Introduction

Assessment of Project's impacts on cultural heritage identifies the following aspects for consideration:

- Above ground sensitive features;
- Potential for survival of archeologically artefacts;
- National or international designated features of cultural significance; and
- Intangible cultural heritage resources.

The method of assessing impacts is as described above in Section 3. The spatial extent of the cultural heritage baseline described below follows the Project AoI.

7.2 Baseline

Cultural heritage including archaeological sites, old mosques, burial sites, sacred grounds, temples, and other historical objects should be protected and maintained since they are national and international assets. Based on the social survey undertaken for this Project, the power plant site does not contain any historical and cultural heritage sites.

The social survey also identified that Okura Village contains a sacred cemetery of village elders located close to the village settlement in a place called Tebing Tinggi, located on the opposite side of the Siak River to the project site. Given its location no direct impacts are anticipated to this cultural heritage feature and therefore no further assessment has been discussed in Section 7.3.

The social survey also noted the following as being located along the gas pipeline route:

- in Koto Gasib Village, there is a burial site of Princess Kacamayang, daughter of a king during the Gasib kingdom which is located approximately 3 km from the gas pipeline.
- The Putri Puan Elok's tomb, one of the daughters of a noblemen during Gasib Kingdom era. This is located approximately 2 km from the gas pipeline. According to villagers, some notable tombs belong to Raja Panjang and a nobleman are located there. Some of the villagers consider these tombs sacred and often visit them as a form of respect.

These sacred sites can be mapped and analysed in corporation with Riau Museum and Education and Culture division of district and province. However, the exact locations are not included here in order to protect the integrity and privacy of these resources for cultural preservation purposes.

7.3 Impact Assessment

As discussed in Section 7.2 a number of sacred sites have been identified along the gas pipeline route and hold cultural value to the local communities, therefore sensitivity can be considered to be Medium. The construction of the gas pipeline route could potentially cause damage to the scared sites described above. Workers who are not aware of the importance of culture heritage sites may damage them unknowingly and excavation of the gas pipeline trench might encourage looters to find and sell artefacts and in the process damage the scared sites. However, the gas pipeline will be designed to avoid disturbance to any sacred sites identified and therefore no impacts are anticipated resulting in Minor magnitude. The temporary jetty will be sited away from the sacred cemetery in Okura Village and therefore no impacts to this site are excepted. Overall impacts to cultural heritage sites are determined to be of **Minor** impact.

7.4 Chance Find Procedure

'Chance finds' are defined as physical cultural resources encountered unexpectedly during project implementation. 'Physical cultural resources' (PCR) are defined as movable or immovable objects, sites, structures, groups of structures, and natural features and landscapes that have archaeological, paleontological, historical, architectural, religious, aesthetic, or other cultural significance. Their cultural interest may be at the local, municipal, department or international level. The requirements for the chance finds will follow the recommendations of the ADB Environmental Safeguard (point number 11) as detailed in the ADB Safeguard Policy Statement (ADB, 2009) and the IFC Performance Standard 8 (IFC, 2012). The Chance Find Procedure can be found in ESIA Volume 5 – Technical Appendices.

8. Mitigation, Enhancement Measures and Residual Impacts

8.1 Mitigation and Enhancement Measures

Specific mitigation in addition to those inherently within the design of the Project is required to reduce significant impacts (those assessed as Major or Moderate) on social impacts. However, mitigation has also been proposed in the form of good practice measures that will minimise impacts identified in Section 6 and 7 above. The measures described will be collated in the Environmental and Social Management Plan (ESMP) which forms Volume 4 of this ESIA. The ESMP describes actions to be taken to eliminate or reduce impacts to an acceptable level. It will stipulate monitoring regimes required to track the measures implemented. The mitigation and monitoring measures as set out in the ESMP will be implemented via the Project Environmental and Social Management System (ESMS).

Outlined in the sections below are mitigation and enhancement measures associated with the following:

- Employment and Tourism;
- Physical and Economic Displacement;
- Community Health, Safety and Security; and
- Cultural Heritage.

8.1.1 Employment and Tourism

- MRPR and the EPC Contractors will design employment and recruitment opportunities that supports the local community. These will be developed via consultations with local stakeholders, Kecamatan/Kelurahan (Village) administration office and other local stakeholders, including woman and vulnerable groups.
- MRPR in conjunction with the EPC Contractors will establish a local employment brokerage that will publicise job vacancies in ways and during times that villagers will be able to participate. It is important that the employment process is well managed and that the local community is able to actively participate to the extent feasible.
- MRPR will encourage local employment prioritising the three administrative areas: Industri Tenayan, Bencah Lesung and Tuah Negeri along with adjacent villages. Also include the five villages (Meredan, Tualang Timur, Pinang Sebatang, Kuala Gasib, Melebung) and along the gas pipeline route location and Okura Village which is across the Siak River from the temporary jetty location.
- Local villagers will be informed of job opportunities along with the required qualifications in a timely manner, ensuring the advertising process is culturally and administratively appropriate.
- Local businesses will be informed of contracting opportunities in a timely manner.
- MRPR will ensure that the hiring process is conducted as transparently as possible to help the community to understand strategic staffing decisions for the Project.
- MRPR will develop and monitor an internal standard to guide labour practices and apply this to Supply Chain.
- MRPR will develop and implement a Workers Code of Conduct that addresses issues such as anti-social behaviour and drug and alcohol consumption and respect for women in accordance with the applicable regulation. The EPC Contractors will be required to conform to the Code of Conduct.
- MRPR will define targets the employment of women (at all levels and skills) whenever possible. It will be disclosed that recruitment is also open to women in the local communities. Specific recruitment strategies targeting women will be defined in accordance with the culture, regulation and required qualifications.

- MRPR and the EPC contractors will provide opportunities for women and women groups to participate in the work force, and assist them in having good quality work standards so they can train others and are able to work with other companies in the future.
- MRPR will ensure that any grievances raised by tourism providers or other local businesses will be managed in an appropriate and timely manner. Where corrective actions are required; they will be implemented effectively and in a timely manner.

Skills and Training

- MRPR will develop a Workforce Development Strategy – a commitment to maximise employment and skills opportunities for local people.
- MRPR will advise the EPC Contractor to maximize the employment of locals and based on the requisites of qualifications and skills required.
- MRPR and their EPC Contractors will design and develop a capacity building program including mentoring, coaching and apprenticeship opportunities for local villagers to maximise skills development for local people. The employment of local villagers for higher level positions should be maximised to facilitate good community relations.
- MRPR will make efforts to facilitate the growth and development of new entrepreneurs, both individuals and groups originating from affected communities.

Community Development

- MRPR will establish a Community Development Fund to undertake a range of community development initiatives.
- CSR programmes will be designed and implemented by also coordinating with District (Kecamatan) and Village (Kelurahan) Offices, including in partnership with local agencies to create business opportunities for the local community. The CSR programme will be available to the local community, including the workforce that is no longer involved after the construction of the Project.
- CSR programmes will also seek to improve levels of education and skills for people affected by the Project.

8.1.2 Physical and Economic Displacement

A LRP will be developed and implemented prior to the commencement of Project construction in accordance with ADB Safeguard Policy Statement (2009) and IFC Performance Standards (2012). The LRP will outline those people that will be economically affected by the land acquisition and construction process and how compensating those livelihoods will be maintained or enhanced including compensating for even temporary loss of livelihoods that may occur as a result of the Project.

8.1.3 Community Health, Safety and Security

- To prevent social tensions between the workforce and the local population, MRPR will develop a Worker's Code of Conduct.
- The EPC contractors will undertake pre- employment screening to ensure employees are fit to work.
- MRPR and their EPC Contractors' will provide free and anonymous health surveillance and active screening and treatment of workers including sexually transmitted diseases.
- MRPR and their EPC Contractors' will prevent illness among workers in local communities by undertaking health awareness and education amongst the workforce and in the neighbouring communities.
- MRPR and their EPC Contractors' will prepare and implement a sexually transmitted disease Management Plan/Procedure.

- MRPR and their EPC Contractors' will define and implement measures to prevent vector-borne diseases (such as avoidance of stagnant water, measures to avoid mosquito development).
- MRPR and their EPC Contractors' will provide adequate and sufficient sanitation facilities for both female and male workers.
- Meals provided by MRPR or the EPC contractors shall be in line with international standards of hygiene and health requirements.
- A Worker Policy and Code of Behaviour shall be developed which includes guidance on visits, prescribed actions for conduct violations and a grievance mechanism for complaints.
- The EPC Contractor shall involve external stakeholders (i.e. police or local authorities) in any on-site or off-site security incidents and ensure that appropriate incident response procedures are implemented.
- Access to all construction sites will be controlled with no unauthorised access from local communities permitted.
- MRPR and their EPC Contractors' will train the security guards on human rights issues. The security guards will not be armed. They will coordinate with local government security forces in case of need and will ensure that security and human rights of members of the local communities' are respected.
- A Security Management Plan shall be developed in accordance with national law and the principles of good international industry practice.

8.1.4 Cultural Heritage

- MRPR will develop and implement a Chance Find Procedure for all Project components. This Procedure will be applied by the EPC Contractor's and all Subcontractors during all Project construction works. See ESIA Volume 5 – Technical Appendices.
- The Worker's Code of Conduct will include a section on Cultural Heritage and respect of local beliefs and traditions in the local communities. All workers will be made aware of the Code of Conduct and awareness sessions will be organized for all new staff.
- If any element of cultural heritage is discovered during the construction of the Project, mitigation measures to protect them and to ensure that the local population can access them will be defined and implemented. These measures will be defined in a participatory manner with the affected persons or communities.

8.2 Monitoring

The following monitoring strategies shall be implemented:

- During construction and operation, the number of people being employed by the Project from the three villages adjacent to the power plant site (Industri Tenayan, Bencah Lesung and Tuah Negeri), the five villages along the gas pipeline route (Maredan, Kuala Gasib, Pinang Sebatang, Tualang Timur and Melebung) and Okura Village should be monitored.
- Monitoring of the recruitment process and implementation of employment, health, safety and security mitigation measures shall be implemented.
- Participatory monitoring shall be conducted by the local community members via representatives selected or appointed by the villagers.
- During construction and operation, surveys shall be conducted to determine the number of new businesses and increase or decreases in tourism businesses generated by the development and the level of indirect employment.
- MRPR will establish adequate numbers and training capacity of community liaison officers.

- A MRPR Community Liaison Officer will be responsible for updating and monitoring the implementation of the LRP and Grievance Mechanism defined in the SEP.
- An independent third party review is recommended of the effective implementation of the LRP, one year after civil construction works commence.
- Examination of ADB Safeguards and IFC Performance Standards to be monitored by MRPR through on-site visits on a quarterly basis.
- The grievance mechanism resolution and grievance database shall be monitored with progress reported on a quarterly basis.

8.3 Residual Impacts

Residual impacts are those which remain once proposed mitigation measures have been put in place. All impacts identified from construction and operation of the Project are anticipated to be of Negligible significance apart from economic displacement which was determined to be of Moderate significance. In consideration of the mitigation measures described above overall residual impacts from the construction and operation of the Project are anticipated to be **Minor** to **Negligible** significance.

A summary of social impacts, mitigation and monitoring measures and residual impacts during construction and operation is summarised in Table 8.1 below.

Table 8.1 : Summary of Social Impacts during Construction and Operation

Activity	Potential Impact	Sensitivity	Magnitude	Significance	Key Mitigation (see Section 8)	Residual Impact Significance
Employment	Direct – Employment opportunities (Beneficial)	Medium	Moderate	Moderate	N/A	Moderate (Beneficial)
	Direct – Conflict from not employing local resources	Medium	Minor	Minor	See Section 8.1.1	Negligible
	Indirect – Employment opportunities for local businesses (Beneficial)	Medium	Minor	Minor	N/A	Minor (Beneficial)
Displacement	Temporary physical displacement	Medium	Minor	Minor	N/A	Negligible
Economic Displacement and Livelihood	Economic displacement at power plant	Low	Negligible	Negligible	Development and implementation of a LRP (see Section 8.1.2)	Negligible
	Economic displacement at temporary jetty	Low	Negligible	Negligible		Negligible
	Economic displacement at water intake and discharge pipelines	Medium	Minor	Minor		Negligible
	Economic displacement along gas pipeline route	Medium	Moderate	Moderate		Minor
Tourism	Disruption to areas of tourist interest and tourism businesses	Low	Negligible	Negligible	See Section 8.1.1	Negligible
Community Health, Safety and Security	Influx of workers – transmissible diseases	Low	Minor	Negligible	See Section 8.1.3	Negligible
	Safety and Security – Increased river traffic during construction	Medium	Negligible	Negligible		Negligible
Gender	Gender bias towards men	Medium	Minor	Minor	See Section 8.1.1	Negligible
Vulnerable	Economic displacement	Medium	Moderate	Moderate	Development and implementation of a LRP (see Section 8.1.2)	Minor
Education	Disruption to schools along the gas pipeline route	Medium	Negligible	Negligible	N/A	Negligible
	Capacity building / training	Medium	Minor	Minor	See Section 8.1.1	Minor (Beneficial)
Ecosystem Services	Loss of provisioning services associated Siak River	Low	Negligible	Negligible	N/A	Negligible
	Removal of plants used for medicinal	Negligible	Negligible	Negligible		Negligible

Activity	Potential Impact	Sensitivity	Magnitude	Significance	Key Mitigation (see Section 8)	Residual Impact Significance
	purposes					
Cultural Heritage	Loss/damage to cultural heritage sites	Medium	Minor	Minor	Develop and implement a Chance Find Procedure (see ESIA Volume 5 – Technical Appendices). See Section 8.1.4 for further mitigation.	Negligible

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Riau 275 MW Gas Combined Cycle Power Plant IPP - ESIA

Medco Ratch Power Riau

Volume 4: ESMP and Framework ESMS

AM039100-400-GN-RPT-1007 | V2

May 2018

Project Name

Project No:	AM39100
Document Title:	Volume 4: ESMP and Framework ESMS
Document No.:	AM039100-400-GN-RPT-1007
Revision:	V2
Date:	May 2018
Client Name:	Medco Ratch Power Riau
Project Manager:	Eamonn Morrissey
Author:	Alex Gifford
File Name:	I:\AENVW\Projects\AM039100 Riau\Deliverables\ESIA\Volume 4 - Framework ESMS and ESMP

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Document history and status

Revision	Date	Description	By	Review	Approved
0	04/04/2018	Draft for client review	Alex Gifford	B Clarke	E Morrissey
V1	12/04/2018	Final Draft for Issue	A Kubale	B Clarke	E Morrissey
V2	18/05/2018	Final Draft for Disclosure	A Kubale	B Clarke	E Morrissey

Contents

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The sole purpose of this report and the associated services performed by Jacobs New Zealand Limited (Jacobs) is to set out the Environmental and Social Management Plan (ESMP) and Framework Environmental and Social Management System (Framework ESMS) which forms part of the Environmental and Social Impact Assessment for the Project in accordance with the scope of services set out in the contract between Jacobs and the Client. That scope of services, as described in this report, was developed with the Client.

In preparing this report, Jacobs has relied upon, and presumed accurate, any information (or confirmation of the absence thereof) provided by the Client and/or from other sources. Except as otherwise stated in the report, Jacobs has not attempted to verify the accuracy or completeness of any such information. If the information is subsequently determined to be false, inaccurate or incomplete then it is possible that our observations and conclusions as expressed in this report may change.

Jacobs derived the data in this report from information sourced from the Client (if any) and/or available in the public domain at the time or times outlined in this report. The passage of time, manifestation of latent conditions or impacts of future events may require further examination of the project and subsequent data analysis, and re-evaluation of the data, findings, observations and conclusions expressed in this report. Jacobs has prepared this report in accordance with the usual care and thoroughness of the consulting profession, for the sole purpose described above and by reference to applicable standards, guidelines, procedures and practices at the date of issue of this report. For the reasons outlined above, however, no other warranty or guarantee, whether expressed or implied, is made as to the data, observations and findings expressed in this report, to the extent permitted by law.

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List of Abbreviations

Acronym	Meaning
ADB	Asian Development Bank
AMDAL	Analisis Mengenai Dampak Lingkungan
CPM	PT Citra Panji Manunggal
EHS	Environmental, Health and Safety
EPC	Engineering, Procurement, Construction
EPFI	Equator Principle Financial Institution
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
ESMS	Environmental and Social Management System
GIIP	Good International Industry Practice
HR	Human Resources
HSE	Health Safety and Environment
IFC	International Finance Corporation
LEC	Lotte Engineering & Construction
LRP	Livelihood Restoration Plan
MRPR	Medco Ratch Power Riau
RAP	Resettlement Action Plan
RKL	Rencana Pengelolaan Lingkungan Hidup (Environmental Management Plan)
RPL	Rencana Pemantauan Lingkungan Hidup (Environmental Monitoring Plan)
SEP	Stakeholder Engagement Plan
UKL	Upaya Pengelolaan Lingkungan (Environmental Management Effort)
UPL	Upaya Pemantauan Lingkungan (Environmental Monitoring Effort)
WBG	World Bank Group
WHO	World Health Organisation

1. Introduction

Volume 4 of the Environmental and Social Impact Assessment (ESIA) presents the Environmental and Social Management Plan (ESMP) and Framework Environmental and Social Management System (ESMS) prepared for the Riau 275 MW Combined Cycle Gas Fired Power Plant IPP Project (referred to hereafter as the 'Project'). The Project consists of a 275 MW combined cycle power plant and ancillary facilities, a 40 km long 12-inch gas pipeline, a switchyard and a 750 m long 150 kV transmission line.

The Project Sponsors being PT Medco Power Indonesia (MEDCO) and Ratchaburi Electricity Generating Holding PCL (RATCH), have formed PT Medco Ratch Power Riau (MRPR) to build, own and operate the plant under the terms of the Power Purchase Agreement (PPA) which has been agreed with PT Perusahaan Listrik Negara (Persero) ("PLN"). Construction will be undertaken by two EPC Contractors being, Lotte Engineering & Construction (LEC) and PT Citra Panji Manunggal (CPM).

The building and operation of the power plant comprises two main phases:

1) Construction of:
    a. Power plant, switchyard, transmission line, water supply and discharge structures and pipelines – managed by LEC
    b. Gas pipeline – managed by CPM
2) Operation – managed by MRPR.

1.1 Overview

This ESIA Volume 4: ESMP and Framework ESMS provides the following:

- An Environmental and Social Management Plan (ESMP) – Summarises the mitigation and monitoring measures that should be employed during the construction Phases for the Project. The ESMP will summarise the Project Owner's commitments to address, mitigate and monitor risks and impacts identified as part of the ESIA, through management, avoidance, minimisation and if required compensation/offset.
- A Framework Environmental and Social Management System (ESMS) - The Framework ESMS provides a framework of the key elements for developing and implementing an Overarching ESMS which sets out how the mitigation and monitoring will be implemented, checked and reviewed for the life of the Project.

The findings of the ESIA (ESIA Volume 1: Introduction, ESIA Volume 2: EIA (Terrestrial) and ESIA Volume 3: EIA) are used to develop associated documentation, such as the ESMP and Framework ESMS, as shown below in Figure 1.1.

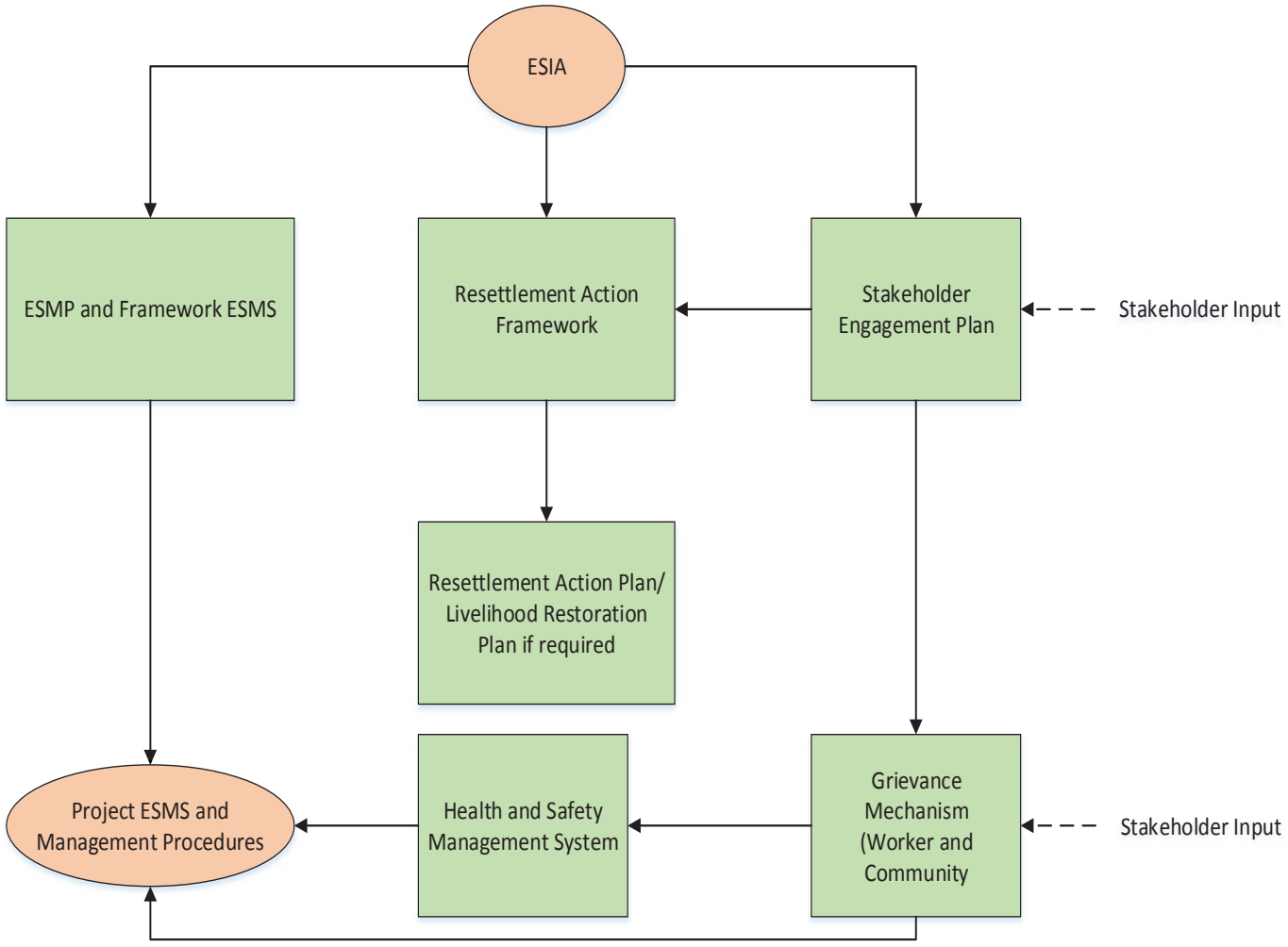


Figure 1.1 : Flow diagram showing how ESMS is developed from the ESIA and how the documents are interrelated

1.2 Structure of ESIA Volume 4

This ESIA Volume 4 of the ESIA is structured as follows:

- Section 2 – Environmental and Social Management Plan (ESMP)
- Section 3 – Framework Environmental and Social Management System (Framework ESMS)
- Section 4 – Assessment Against ADB Safeguards, Equator Principles and IPC performance standards

2. Environmental and Social Management Plan

2.1 Introduction

The ESMP describes and prioritises the actions needed to implement mitigation measures, corrective actions and monitoring measures necessary to manage the impacts and risks identified in this ESIA related to the Project. Implementation of the ESMP will take place under the broader framework of the ESMS and will be implemented and managed by the MRPR and the EPC Contractors. The EPC Contractors and MRPR will also adhere to the procedures and requirements as set out in the ESMP. The mitigation measures and action plans covered in this section therefore relate onto to pre-construction, construction and operation stages for the project.

The ESMP has been prepared in accordance with the following ADB Safeguard policy principles:

> ***Environmental Policy Principle 4***
>
> *"Avoid, and where avoidance is not possible, minimize, mitigate, and/or offset adverse impacts and enhance positive impacts by means of environmental planning and management. Prepare an environmental management plan (EMP) that includes the proposed mitigation measures, environmental monitoring and reporting requirements, related institutional or organizational arrangements, capacity development and training measures, implementation schedule, cost estimates, and performance indicators. Key considerations for EMP preparation include mitigation of potential adverse impacts to the level of no significant harm to third parties, and the polluter pays principle."*
>
> ***Involuntary Resettlement Policy Principle 8***
>
> *"Prepare a resettlement plan elaborating on displaced persons' entitlements, the income and livelihood restoration strategy, institutional arrangements, monitoring and reporting framework, budget, and time-bound implementation schedule."*
>
> ***Indigenous Peoples Policy Principle 6***
>
> *"Prepare an Indigenous Peoples plan (IPP) that is based on the social impact assessment with the assistance of qualified and experienced experts and that draw on indigenous knowledge and participation by the affected Indigenous Peoples communities. The IPP includes a framework for continued consultation with the affected Indigenous Peoples communities during project implementation; specifies measures to ensure that Indigenous Peoples receive culturally appropriate benefits; identifies measures to avoid, minimize, mitigate, or compensate for any adverse project impacts; and includes culturally appropriate grievance procedures, monitoring and evaluation arrangements, and a budget and time-bound actions for implementing the planned measures."*

The ESMP has been prepared in accordance with Principle 4 of the "Equator Principles" published by the International Finance Corporation (IFC), which states:

> ***Principle 4: (Environmental and Social Management System and Equator Principles Action Plan)***
>
> *"For all Category A and Category B Projects, the EPFI will require the client to develop or maintain an Environmental and Social Management System (ESMS). Further, an Environmental and Social Management Plan (ESMP) will be prepared by the client to address issues raised in the Assessment process and incorporate actions required to comply with the applicable standards. Where the applicable*

standards are not met to the EPFI's satisfaction, the client and the EPFI will agree an Equator Principles Action Plan (AP). The Equator Principles AP is intended to outline gaps and commitments to meet EPFI requirements in line with the applicable standards"

2.2 General Approach to Implementation of Mitigation and Monitoring Measures

The following mitigation measures and action plan will be applied by MRPR to prevent and mitigate the potential negative impacts and to effectively manage the Project for environmental protection, for the pre-construction, construction and operation stages of the Project.

Where necessary, mitigation measures have been proposed to meet the requirements of the ADB Safeguards, Equator Principles, IFC Performance Standards and Indonesian laws and regulations. IFC guidelines require that a sequencing strategy is applied that gives priority to avoiding impacts, then a focus on the reduction or minimisation of impacts that cannot be avoided, and finally where impacts are unavoidable people affected by the Project must receive compensation.

Mitigation measures are identified in the ESIA are summarised below. The mitigation measures proposed also reflect the outcomes from consultation.

In general, the types of mitigation measures identified are implemented by one or more of the following means:

1. Incorporated into the plant design
2. Specifying construction methods
3. Developing and implementing management plans
4. Undertaking monitoring
5. Following consultation and grievance procedures.

Detailed mitigation and monitoring measures will also be outlined in the management plans/procedures as set out in the following sections

MRPR, in collaboration with the EPC Contractors (and any Subcontractors, will establish, maintain, and strengthen as necessary an organisational structure that defines roles, responsibilities and authority to implement the ESMS and ESMP during construction and operation of the Project. Key ESMS responsibilities are defined and will be communicated to the relevant personnel and to the rest of MRPR, as well as the EPC Contractor and any Subcontractors. Sufficient management sponsorship and human and financial resources will be provided by MRPR and the EPC Contractors on an ongoing basis to achieve effective and continuous ESMS performance and the implementation of mitigation and monitoring measures as set out in the ESMP. The schedule and budget are currently being determined and will be disclosed prior to financial closure. In addition, due to MRPRs commercial confidentiality concerns, this breakdown of schedule and budget for implementation of the ESMP will be provided as a separate document to lenders to this ESIA.

Management of environmental and social risks and impacts during construction will primarily be the responsibility of the EPC Contractor through the EPC Contract. During the construction phase, MRPR will review and monitor EPC Contractor's performance in accordance with their Health and Safety and Environment (HSE) Plans/Management Systems and related management plans/procedures to ensure alignment with the Overarching ESMS.

MRPR will operate the power plant and will be responsible for recordkeeping and reporting, maintenance inspections, execution of routine maintenance, periodical maintenance and major overhaul in accordance with the Overarching ESMS, and incident reporting.

2.3 Mitigation Measures – Pre - Construction

There are a range of potential environmental and social impacts and risks associated with the pre-construction phase of the Project. The key mitigation measures are summarised below:

- Along the gas pipeline route and for construction of the temporary jetty there may be some temporary physical displacement of stalls etc having to be moved during construction and some temporary loss of livelihood and as result a Livelihood Restoration Plan (LRP) may be required. First action is to conduct a census survey to identify the potentially affected parties and to obtain data on the asset and loss of livelihood that will be temporarily lost in order to develop the LRP. The LRP must be implemented and all compensations paid before construction commences.
- Resettlement and livelihood action measures will be defined in a participatory manner with the affected people.
- The land acquisition process will be completed prior to construction commencing on a willing seller – willing buyer basis.
- MRPR will encourage the EPC Contractors and Subcontractors to employ and train locals in order to assist those people affected by the development.
- The Grievance Mechanism defined in the Stakeholder Engagement Plan will be disclosed to the neighbouring communities and implemented, and grievances registered and addressed on a case by case basis.
- MRPR will undertake vocational training with current tenants to assist them in obtaining jobs with the Project.
- The Project will adapt the final design to avoid as much as possible destruction of houses and/or buildings. In particular, inhabited houses will be avoided as much as possible to minimise any potential physical displacement.
- Regular direct meetings with the local communities will be undertaken to update them on the progress of the work and to give them the opportunity to voice their concerns.

2.4 Mitigation Measures – Construction and Operation

There are a range of potential environmental and social impacts associated with the construction phase of the Project (Refer to ESIA Volume 2: EIA and ESIA Volume 3: SIA). During construction of the gas fired power plant, gas pipeline, transmission line and access roads, the following mitigation measures are proposed in Table 2.1 for construction and Table 2.2 for operation.

Table 2.1 : Summary of proposed mitigation during construction

Issue	Location of Mitigation Measures	Proposed Mitigation Measures	Responsibility of mitigation
Air quality	All Project construction works – emissions and dust control	• The EPC Contractors and MRPR will develop an Air Quality Management Procedure as part of the ESMS. The AQMP will include actions on: – Water spraying of or covering all exposed areas and stockpiles; – Minimising the size of earthworks, exposed areas and material stockpiles and the periods of their existence; – Covering the construction materials transported by trucks or vehicles to prevent dust emissions; – Limiting dust generation activities in high winds or specific wind directions, if required; – Cleaning wheels and the lower body parts of trucks at all exits of the construction site; and – Maintaining and checking the construction equipment regularly. • Windblown material from stockpiles of soil, aggregate, sand etc should be held in bins or other enclosures, and stockpiles of material including soil, and where practicable covered with a tarpaulin; • Construction vehicles should be periodically checked to ensure that they are not emitting excessive pollutants; • Vehicle speed on the construction site should be set to a maximum of 20 kph to reduce dust release from road surfaces. • To reduce windblown material, grass seed should be sown on soil stockpiles that will remain dormant for more than three months.	LEC and CPM to implement and MRPR to review performance
Cultural Heritage	All Project construction works	• MRPR will implement a Chance Find Procedure for all Project components. This Procedure will be applied by the EPC Contractor's and all Subcontractors during all Project construction works. • The Worker's Code of Conduct will include a section on Cultural Heritage and respect of local beliefs and traditions in the local communities. All workers will be made aware of the Code of Conduct and awareness sessions will be organized for all new staff. • If any element of cultural heritage is discovered during the construction of the Project, mitigation measures to protect them and to ensure that the local population can access them will be defined and implemented. These measures will be defined in a participatory manner with the affected persons or communities.	LEC and CPM to implement and MRPR to review performance
Environmental and Social Management Systems (ESMS)	All Project construction works	• MRPR will develop an Overarching ESMS for the management of environmental and social risk and impacts for the Project • Management of environmental and social risks and impacts during construction will primarily be the responsibility of the EPC Contractors through the EPC Contract and through the development and implementation of Construction ESMS or HSE Plans. • During the construction phase, MRPR will review and monitor EPC Contractors performance in accordance with their Health, Safety and Environment (HSE) Plans and /or Construction ESMS and related management plans/procedures to ensure alignment with the overarching Project ESMS. Management of environmental and social aspects associated with the Project will be carried out in accordance with the CESMS. The CESMS will consist of a set of sub-ordinate plans/procedures, which may include, but are not limited to, the following topics: - construction environmental management; - pest and weed management;	MRPR to prepare overarching ESMS and EPC contractors to prepare Construction ESMS. MRPR to review performance of all ESMS.

Issue	Location of Mitigation Measures	Proposed Mitigation Measures	Responsibility of mitigation
		- biodiversity restoration; - waste management; - hazardous substance management; - soil and erosion management; - air quality/dust management; - environmental and social monitoring; - stakeholder engagement; - grievance mechanism (community and workers); - emergency preparedness and response; - noise and vibration management; - recycling; - landscape management; - chance find procedure; - occupational safety and health management; and - traffic management. • Key personnel will be responsible for ensuring good environmental practice on site during construction will include the MRPR, Project Manager and the EPC Contractors' Site Manager and EPC Contractors HSE Manager. • Staff will be trained in environmental management, auditing and monitoring procedures as per the framework has been outlined in the Framework Environmental and Social Management System (see Section 3).	
Existing Infrastructure	All Project construction works	Construction activities should be operated in a way that will not encroach into the existing infrastructure facilities (e.g. electricity lines, information system, water supply system, offices, etc).	LEC and CPM to implement and MRPR to review performance
Hazardous Substances and Waste	All Project construction works – general measures for waste	• A Waste Management Policy will be prepared by MRPR and will be followed by the EPC Contractors in the development and implementation of their Waste Management Plan during construction. Particular attention will be given to the use and re-use of materials to minimize waste and, whenever practicable, using materials and products from sustainable sources. The EPC Contractors will produce a Waste Management Plan/Procedure in accordance with MRPR Waste Management Policy which shall include steps to: – Minimise the amount of waste produced; – Prepare designated waste storage areas for the wastes which are not able to be immediately disposed of. The waste storage areas should be covered and clearly signed;	LEC and CPM to implement and MRPR to review performance

Issue	Location of Mitigation Measures	Proposed Mitigation Measures	Responsibility of mitigation
		– Educate and train staff on separation of wastes and recycling; – Dispose of hazardous waste via a licensed third party operator; and – Record the disposal of wastes by "Waste Manifest". • Waste should be stored so as to prevent or control accidental releases to air, soil, and water resources. • Liquid wastes should be stored on impermeable surfaces with spill containment systems. Spill containment systems should be constructed with materials appropriate for the wastes being contained and with a drainage and collection system. Spill containment should be included wherever liquid wastes are stored in volumes greater than 220 litres. The available volume of spill containment should be at least 110% of the largest storage container, or 25% of the total storage capacity (whichever is greater), in that specific location. • Hazardous wastes should be stored in a separate storage area which is bunded and hazardous wastes should be removed for treatment and disposal by an approved licensed third party operator. Destruction certificates will be supplied by the licensed operator to indicate how and when the hazardous wastes were treated and disposed of; • Solid waste produced during construction of the Project should be collected onsite as outlined above, and then transferred to a designated waste disposal facility, fortnightly or as required. • A permit for the Temporary Storage of Hazardous Waste will be obtained by the EPC Contractor	
	All Project construction works - hazardous substances use and disposal of hazardous waste	• MRPR will develop a Hazardous Substances Management Policy for construction which will be followed by the EPC Contractors. The EPC Contractors will produce a Hazardous Substances Management Plan/Procedure in accordance with MRPRs Hazardous Substances Management Policy and this will include the following information: • A register should be held and maintained onsite, which sets out the types, volumes and locations of all hazardous substances. • Safety Data Sheets (SDSs) should be compiled in accordance with the approved code of practice for the preparation of material safety data sheets. • Labels on containers should be compiled in accordance with the approved code of practice for the labelling workplace substances. • Induction and training should be provided to all those employees whose work potentially exposes them to hazardous substances; and those employees who are supervising others who are using hazardous substances at work. • Hazardous substances storage containers (including gas cylinders) which are unsafe (e.g. damaged, leaking etc) should be clearly marked as 'out of service' to prevent them from being used, until their disposal. • Designated stores which are appropriately designed and fire rated should be used to store hazardous substances. • Incompatible substances should be stored separately. • Transport of hazardous substances should be carried out in full compliance with the relevant legislative requirements. • Transport vehicles should have appropriate signage and carry documentation on the hazardous substances to be transported.	LEC and CPM to implement and MRPR to review performance

Issue	Location of Mitigation Measures	Proposed Mitigation Measures	Responsibility of mitigation
		• Arrangements should be in place to ensure that the appropriate spill control equipment for storage and transport (i.e. for water and/or land) is available in sufficient quantities for any foreseeable spills. • Suitable firefighting equipment should also be available to suit the type/s of substances being transported. • Any such equipment should be routinely inspected and maintained in good working order and in a state of readiness. • No chemicals should be accepted onto the Project sites or off-loaded without the relevant health, safety and emergency information being made available by the supplier this includes SDSs. • Vehicles and other equipment should be turned off while fuelling operations takes place. • Provisions should be made for the containment, collection and disposal of waste oil and spills that are generated as a result of refuelling activities. Provisions may be in the form of a bunded and impervious area, with a spill and effluent collection system. Alternatively, a portable collection sump will be placed underneath the maintenance and refuelling areas to contain any spillage and/or minor leaks. • The EPC Contractors will prepare and implement and emergency response plan/procedure which manage spoils, fires etc., and include warning and evacuation of nearby residences. • All hazardous waste, including used spill response items, oils and residues, including drums and containers which were used to hold hazardous substances, and sludge removed from septic tanks, should be collected and transported an appropriately licensed hazardous waste disposal facility for disposal. • A Hazardous Waste Store should be developed at the site during construction for the temporary storage of hazardous wastes generated including contaminated soil waiting to be disposed of offsite to a licensed hazardous waste disposal facility.	
	All Project construction works - spill management	• An Emergency Response plan/procedure will be prepared, which includes measures for dealing with a spill. • Vehicles should only be filled in designated locations where the area is hard paved and the collection sump is connected to the wastewater treatment system. • In the event of a spill during construction, spill containment and clean up equipment should be located onsite. This should include equipment for: - Containing and cleaning any spill such as a shovel, broom, drain covers, sandbags, booms and absorbent material. All spills will be handled with compatible materials. - Storing and disposing of spilled material such as safe containers, bags, and drums. - Protecting the safety of staff through PPE. - Any spills will be contained and cleaned up immediately and disposed of at an approved facility. Incidents should be recorded and reported following the accident reporting system as detailed in the HSE Plan. This includes the preparation of an Accident/Incident Report.	LEC and CPM to develop and implement and MRPR to review performance
Landscape	All Project construction works	• After construction is complete the gas pipeline and power plant site should be landscaped in order to improve visual amenity. This will also aid in limiting soil erosion at the site during heavy rainfall events.	LEC and CPM to implement

Issue	Location of Mitigation Measures	Proposed Mitigation Measures	Responsibility of mitigation
		• Where possible the soil removed during earthworks for construction should be reinstated and used as topsoil for the proposed landscaping bunds. • Plants used in any landscape planted should be nursery grown and should be sound, healthy, and vigorous and free from insect infestations. Trees and shrubs should be chosen to tolerate weather conditions and other such site characteristics. Maintenance operations should begin immediately after each plant is planted by mulching, watering, pruning, spraying, weeding and other necessary operations of maintenance • A Pest and Weed Management Plan/Procedure will be developed by the EPC Contractors and planting beds will be kept free of weed, grass and other undesired vegetation growth. • Any lighting requirements should be designed to ensure light spill is directed into the site. • Where possible the selection of neutral/muted cladding and external finishing would aid in limiting the extent of adverse visual impacts. • Site fencing has the potential to aid in mitigating adverse visual effects of the power plant by partially screening and softening the visual impact of the site and ensuring light spill from the site is minimised.	and MRPR to review performance
Hydrology	Pipeline and Power plant construction	• Following surveying of the boundary of the construction pad, diversion drains should be excavated around the perimeter of the site to convey overland flow to appropriate locations downstream. During construction these could be temporary excavations, rock or geotextile lined to reduce erosion. • Direct site runoff from the 9.1 ha will be captured via interceptor ditches and sumps/sediment ponds. In localised areas, sediment runoff could be managed through silt fences. • Any discharges of concentrated flow should be to watercourses that have adequate erosion protection in place to prevent gullying of channels, bank collapse and increased sedimentation downstream. • Should local water sources be required for meeting some construction demands including vehicle and equipment washdown, the use of temporary portable storage tanks or lined earth reservoir is advised. Multiple 25,000 L plastic tank (3.6 m x 2.8 m) could provide storage for firefighting and water supply, and be topped up at low abstraction rates (<5 L/s) to reduce environmental impacts. • For the gas pipeline construction, near stream works should require local sediment controls such as silt fences or downstream sediment traps to reduce the effects of disturbance. • An Erosion and Soil Control Plan/Procedure (ESCP) will be developed by the EPC Contractors before the construction phase. The typical objectives of a ESCP are as follows: – To minimise any potential adverse environmental effects on water quality and aquatic ecosystems from the proposed stormwater discharge from the operation of the development. – To protect and enhance the natural character and amenity of watercourses from the proposed stormwater discharge from the operation of the pipeline and plant.	LEC and CPM to implement mitigation and MRPR to review performance

Issue	Location of Mitigation Measures	Proposed Mitigation Measures	Responsibility of mitigation
		– To minimise any potential adverse environmental effects from flooding or erosion (inclusive of land or watercourses) from the stormwater discharge from the operation of the pipeline and plant.	
Noise and Vibration	All Project construction works	• MRPR will produce a Noise and Vibration Management Policy which the EPC Contractors will follow and will use to develop a Noise and Vibration Management Plan/Procedure for the construction phase. • The EPC Contractors HSE Officers should periodically check the site and nearby residences for noise problems so that solutions can be quickly applied. • Construction workers should avoid the use of radios or stereos, shouting and slamming vehicles doors, especially during any scheduled night time activities. • Truck routes to and from the worksite should be restricted to major roads where possible • All vehicles, plant and equipment should be turned off when not in use. • Adherence to the standard hours of construction (7.00am to 6.00pm) should be observed with periods of rest and respite. • Regular inspection and maintenance of machinery should avoid increased noise levels from rattling hatches, loose fittings etc. • The use of non- 'beeper' reversing/movement alarms such as broadband (non-tonal) alarms or ambient noise sensing alarms will reduce excess noise. • All doors/hatches should be shut during operation of plant and equipment. • Work compounds, parking areas, equipment and material stockpile sites will be positioned away from noise-sensitive locations. • Along the gas pipeline route all residential properties and other key stakeholders such as schools and educational facilities should be notified prior to the commencement of works. Note: the gas pipeline will be constructed in sections of no more than 500 m at a time. • Regularly train workers and contractors to use equipment in ways to minimise noise.	LEC and CPM to implement and MRPR to review performance
Social / Economic	All Project construction works	*General* • MRPR will respect and apply industrial good practices as highlighted in WBG EHS Guidelines. This includes among others: no operation during night time near inhabited settlements, implementation of noise and dust control measures, low speed limits for the Project's vehicles in inhabited areas. *Grievance* • The Project will implement regular consultations with project affected people, their grievances will be noted, treated and addressed. • The Grievance Mechanism defined in the Stakeholder Engagement Plan will be disclosed to the neighbouring communities of the power plant and along the gas and water pipeline routes. Grievances received will be registered and addressed on a case by case basis. *Jobs / Employment*	LEC and CPM to implement and MRPR to review performance

Issue	Location of Mitigation Measures	Proposed Mitigation Measures	Responsibility of mitigation
		• MRPR and the EPC Contractors will design employment and recruitment opportunities that supports the local community. These will be developed via consultations with local stakeholders, Kecamatan/Kelurahan (Village) administration office and other local stakeholders, including woman and vulnerable groups. • MRPR in conjunction with the EPC Contractors will establish a local employment brokerage that will publicise job vacancies in ways and during times that villagers will be able to participate. It is important that the employment process is well managed and that the local community is able to actively participate to the extent feasible. • MRPR will encourage local employment prioritising the three administrative areas: Industri Tenayan, Bencah Lesung and Tuah Negeri along with adjacent villages. Also include the five villages (Meredan, Tualang Timur, Pinang Sebatang, Kuala Gasib, Melebung) and along the pipeline route location and Okura village which across the jetty site location. • Local villagers will be informed of job opportunities along with the required qualifications in a timely manner, ensuring the advertising process is culturally and administratively appropriate. • Local businesses will be informed of contracting opportunities in a timely manner. • MRPR will ensure that the hiring process is conducted as transparently as possible by the EPC Contractors to help the community to understand strategic staffing decisions for the Project. • MRPR will develop and monitor an internal standard to guide labour practices and apply this to Supply Chain for EPC Contractors to follow and implement. • MRPR will develop and implement a Workers Code of Conduct that addresses issues such as anti-social behaviour and drug and alcohol consumption, and respect for women in accordance with the applicable regulation. The EPC Contractors will follow the Code of Conduct. • MRPR will define targets for the employment of women (at all levels and skills) whenever possible by EPC Contractors. It will be disclosed that recruitment is also open to women in the local communities. Specific recruitment strategies targeting women will be defined in accordance with the culture, regulation and required qualifications. • MRPR and the EPC Contractors will provide opportunities for women and women groups to participate in the work force, and assist them in having good quality work standards so they can train others and are able to work with other companies in the future. *Skills and Training* • MRPR will develop a Workforce Development Strategy – a commitment to maximise employment and skills opportunities for local people. • MRPR and their EPC Contractors will design and develop a capacity building program including mentoring, coaching and apprenticeship opportunities for local villagers to maximise skills development for local people. The employment of local villagers for higher level positions should be maximised to facilitate good community relations.	

Issue	Location of Mitigation Measures	Proposed Mitigation Measures	Responsibility of mitigation
		• MRPR will make efforts to facilitate the growth and development of new entrepreneurs, both individuals and groups originating from affected communities. *Community Development* • MRPR will establish a Community Development Fund to undertake a range of community development initiatives. • Corporate Social Responsibility (CSR) programmes will be designed and implemented by also coordinating with District (Kecamatan) and Village (Kelurahan) Offices, including in partnership with local agencies to create business opportunities for the local community. The CSR programme will be available to the local community, including the workforce that is no longer involved after the construction of the Project. • CSR programmes will also seek to improve levels of education and skills for people affected by the Project. *Health and Social Initiatives* • To prevent social tensions between the workforce and the local population, MRPR will develop a Worker's Code of Conduct. • The EPC Contractors will undertake pre-employment screening to ensure employees are fit to work; • MRPR and their EPC Contractors will provide free and anonymous health surveillance and active screening and treatment of workers including sexually transmitted diseases. • MRPR and their EPC Contractors will prevent illness among workers in local communities by undertaking health awareness and education amongst the workforce and in the neighbouring communities. • MRPR and their EPC Contractors will prepare and implement a Sexually Transmitted Disease (STD) Management plan/procedure. • MRPR and their EPC Contractors collaborate with local authorities to enhance access to public health services and promote immunisation. • A Worker Policy and Code of Behaviour will be developed which includes guidance on visits, prescribed actions for conduct violations and a grievance mechanism for complaints. • The EPC contractor shall involve external stakeholders (i.e. police or local authorities) in any on or off-site security incidents and ensure that appropriate incident response procedures are implemented. • MRPR and their EPC Contractors will define and implement measures to prevent vector-borne diseases (such as avoidance of stagnant water, measures to avoid mosquito development). • MRPR and their EPC Contractors will provide adequate and sufficient sanitation facilities for both female and male workers. • Meals provided by MRPR or the EPC contractors shall be in line with international standards of hygiene and health requirements. *Access and Security* • Access to all construction sites will be controlled with no unauthorised access from local communities permitted.	

Issue	Location of Mitigation Measures	Proposed Mitigation Measures	Responsibility of mitigation
		• MRPR and their EPC Contractors will train the security guards on human rights issues. The security guards will not be armed. They will coordinate with local government security forces in case of need and will ensure that security and human rights members of the local communities are respected. • A Security Management Plan shall be developed in accordance with national law and the principles of good international industry practice. • Any worker's accommodation shall be developed according to ADB safeguards and IFC Performance Standard 2 and ensure there is no race discrimination for basic services for accommodation and healthy meals provided by the company	
Soils, Geology and Groundwater	All Project construction works - soil erosion	• An Erosion and Soil Control Plans/Procedures will be developed by the EPC Contractors with one covering the gas pipeline route and the other the power plant, water pipeline and temporary jetty. • Excavated earth should be strongly compacted and cut-off ditches should be dug in erosion prone areas to divert water away for the earthworks and to settling ponds before discharge to nearby water courses. • Silt curtains, fibrous mats etc should be placed across as temporary stormwater drains to reduce the efflux velocity of the water and to aid settling of suspended sediment from the water.	LEC and CPM to implement mitigation and MRPR to review performance
	All Project construction works - soil and groundwater pollution	• Spill kits should be located on the construction site to manage and contain any fuel or hazardous substance spillage. • If an accident does occur, then contaminated soil should be excavated and replaced with clean fill to minimise (or prevent) groundwater contamination with treatment of any stormwater runoff or process water prior to disposal. • All wastewater should be collected prior to discharge. • Oily and/or hazardous waste should be separately collected and disposed of by an appropriately licensed operator. • The laying of overland flow diversion drains and preload fill should be completed preferable during the dry season and prior to the pipeline and power plant construction earthworks commencing. • Drainage water collection and treatment systems should be installed as a priority to prevent discharge to the adjacent rivers and streams. • Groundwater dewatered from the power plant site excavations will be treated prior to disposal to land downgradient of the power plant.	
	All Project construction works - excavated material	• Prior to filling, sub-grade surfaces of depressions should be free of standing water and unsatisfactory soil materials will be removed. • All unnecessary excavated materials should be transported and deposited outside of the site at an approved facility. • Where excavated material is suitable to be used for fill and backfill, the material should be segregated and transported to a stockpile location at the construction site.	
Terrestrial Ecology	Gas pipeline construction	• The vegetation clearance required should be kept to an absolute minimum by avoiding undertaking any work in areas that are potentially critical habitat • The felling of mature trees (except oil palm), and large areas of scrub/immature vegetation should be avoided.	CPM to implement mitigation and MRPR to

Issue	Location of Mitigation Measures	Proposed Mitigation Measures	Responsibility of mitigation
		• Clear demarcation of the pipeline construction area limits should occur to avoid any accidental incursion in to the adjacent habitats. • Temporary working areas should be replanted, if possible by using saplings salvaged from the site clearance phase. • Excavations should be covered or fenced at the end of the working day to avoid incursion by species. • Exits points in the excavations should be provided to allow any animals which enter the pipeline trench to escape. • Tool box talks should be undertaken to construction staff to highlight the presence of local wildlife and behaviour towards it.	review performance
	All project construction works	• The vegetation clearance required should be kept to a minimum with felling of mature trees (except oil palm), and large areas of scrub/immature vegetation avoided. • Site management measures will include: – Clear demarcation of site limits; – Directional site lighting; – Tool box talks to construction staff to highlight the presence of local wildlife and behaviour towards it. • Night-time deliveries of construction equipment and material should be avoided. • Temporary working areas should be replanted, if possible by using saplings salvaged from the site clearance phase. • Excavations should be covered or fenced at the end of the working day to avoid incursion by species. • A speed limit of 20 kph should be enforced between the jetty and the power plant site.	LEC and CPM to implement mitigation and MRPR to review performance
Traffic Management and Access	All project construction works	• A Traffic Management Plan/Procedure (TMP) will be produced by the EPC Contractors. This plan/procedure will involve: - identifying routes within the site and from the main road to the site; - identifying weight/height restrictions and alternative routes; - developing a signing strategy for the routes; - formulating mechanisms for vehicle control; • All heavy and / or oversized loads should be transported to site via barge to avoid the need to truck the cargo through local roads. Where possible also transport other loads via barge to further reduce impacts on local roads. • Deliveries should be made at off-peak times when there are fewer local people using the road and when children would not be walking to and from school. • Project and the associated construction traffic should be discussed with the local community so that residents are aware of what is happening and can plan ahead in anticipation of delays. • Workers should be transported to and from the site via minibus instead of by car or motorbike. • A Community Liaison Officer should discuss road safety with community leaders and residents to encourage the safe use of the road.	LEC and CPM to implement mitigation and MRPR to review performance

Issue	Location of Mitigation Measures	Proposed Mitigation Measures	Responsibility of mitigation
		• A truck wheel wash facility should be provided to clean truck wheels prior to exiting the site in order to prevent dust and spoil being transported on to the public road. • The traffic impacts from removing the excess soil from the site should be minimised by careful choice of the site for dumping the soil and also through developing a traffic management plan/procedure for this component of the work which addresses impacts related to this work. • If it is not possible to transport an over width load by barge, then pilot vehicles will be used when transporting oversized and/or heavy equipment to site to warn drivers of approaching hazards. • Consideration should be given to the speed at which the vehicles are advised to travel on the public road network and especially in rural areas. • Construction traffic drivers should be asked to reduce speeds in built up areas and ensure that braking distances are acceptable. • Operators of the vehicles should regularly maintain vehicles to reduce excessive emissions. • Other procedures to prevent the deposition of slurry, clay or other materials on roads by vehicles leaving the site should include: - provision of cleaning facilities including hoses, brooms and shovels; - twice daily monitoring, and education of all construction staff/drivers to monitor for any material which may be accidently spilt onto public roads from construction traffic; and - maintaining a contingency of sweeper equipment on call at all times to clean up material which may be accidently spilt onto public roads. • Adherence to the TMP should be included within site induction and weekly toolbox meetings as required to ensure all site staff are aware and practice the required clean roads protocols. • The TMP should outline methods for controlling noise and vibration associated with construction traffic. • It is recommended that a Travel Plan is written and distributed to staff to inform them of the best ways to travel to the sites of the Project. Staff should be encouraged to take public transport, car pool or that the contractor provides transport for them.	
	Gas pipeline construction	• Adequate temporary traffic management along the route of the 40 km long gas pipeline should be provided to ensure impacts on traffic movement (from safety and delays) are minimised. • Where possible, only half the road should be excavated at a time to allow traffic to continue to use the other lane with a stop start control. Where full road closure is required a short detour around the construction site should be provided. • Work at night should be avoided for safety reasons. • The EPC Contractors will provide safe access for pedestrians and cyclists throughout the duration of construction phase of the Project.	CPM to implement mitigation and MRPR to review
Working Conditions		• The EPC Contractors will issue all Project staff with an individual contract of employment detailing their rights and conditions in accordance with the national law and ADB requirements related to hours of work, wages, overtime, compensation and benefits such as maternity or annual leave, and update the contract when material changes occur.	MRPR, LEC and CPM to

Issue	Location of Mitigation Measures	Proposed Mitigation Measures	Responsibility of mitigation
		• Generic rules shall be provided within employment contracts and task specific procedures will be communicated during tool box talks and displayed on machinery or within hazardous work areas. • A worker's grievance mechanism will be established. In compliance with World Bank Group Standards, this grievance mechanism will be designed to receive and facilitate resolution of concerns and grievances about the Project's working conditions and safety performance.	implement mitigation
Occupational Health and Safety	All Project construction works	• The EPC Contractors will be required to develop and implement an Occupational Health Safety Management System OHSMS) for the construction activities at the Project site, which will apply to all personnel involved in the Project, including Subcontractors and part-time workers. The primary health and safety objectives will be to ensure effective measures and management of occupational health and safety to minimise workplace accidents and injuries. In addition, any Subcontractors appointed by the EPC Contractors will be required to submit their own OHS Plans/Health and Safety Management Systems which will meet EPC Contractor and MRPR safety requirements. • The Safety Management System will have a procedure for identifying all hazards associated with the activity in question. A hazard in this context is defined as any aspect of the Project activities which could result in harm to onsite personnel. • The EPC Contractors and Subcontractors will be made aware of their role in ensuring the Project meets international standards related to labour and working conditions, and will be contractually obliged to do so. The EPC Contractors will establish a hierarchy of responsibility with regards for the provision of health and safety. • MRPR and the EPC Contractors will establish a hierarchy of responsibility with regards for the provision of health and safety. The precise titles and roles of each member will be determined by MRPR and the EPC Contractors prior to work on the site. • A Health and Safety Management Committee will be appointed to evaluate health and safety at the power plant site and to assess and recommend changes to equipment, policy and/or procedures where required by health and safety issues. The Committee will comprise members from MRPR, EPC Contractors and subcontractors. • Staff should be trained in safety procedures and provided with Personal Protective Equipment (PPE). • All hazardous work shall require the completion of a permit-to-work form and approval by the OHS Manager prior to commencement. • A Security Procedure shall be included within the OHS Plan covering areas of security control, working hours etc. • Emergency Response Procedures will form an integral part of the OHS Plans/HSMS. As part of these, an Emergency Response Plan shall be prepared to address emergencies of all scales.	LEC and CPM to implement mitigation and MRPR to review performance
Water Quality and Freshwater Ecology	Construction and use of temporary jetty on the Siak River	• Where possible works should occur in dry working conditions with work areas being isolated from the river flow and pumped dry. • Sediment control devices such as vertically hanging silt curtains should be employed around the tunnel area to minimise suspended material moving outside the work area during excavations. • Excavated material should be removed from the river channel and disposed of to an appropriate site.	LEC to implement mitigation and MRPR to review performance

Issue	Location of Mitigation Measures	Proposed Mitigation Measures	Responsibility of mitigation
		• Spill clean-up kits including floating booms should be available at the jetty to respond to any spills from vessels using the jetty. The spill kit elements should be appropriate for the type and nature of products being imported and for general spills of oils and fuels from boats.	
	All construction activities	• An Erosion and Sediment Control Plan/Procedure (ESCP) will be developed for all project earthwork and construction elements with a risk of generating sediment laden runoff that could impact upon the Siak River and river crossings along the gas pipeline route. This should include as a minimum: – Measures to isolate and divert clean water around open work areas; – Measures and work staging to minimise the amount of bare land open at any time; – Measures taken to minimise erosion and the entrainment of sediment within water flowing onsite; – Measures taken to treat sediment once it is entrained in water prior to discharge. Measures may include silt fences and sediment settlement ponds. Methods used should be designed to achieve a discharge limit of 50 mg/L of total suspended solids. • The water supply intake should be designed to minimise the risk of entrainment of fish within the intake by the installation of an appropriately sized screen.	LEC and CPM to implement mitigation and MRPR to review performance
	Construction of the gas pipeline crossings	• Sediment laden dewatering water from open work areas within stream crossings should be discharged after filtration to the bypass water and then back into the stream.	CPM to implement mitigation and MRPR to review performance

For the operation phase it will be the responsibility of MRPR to implement and the manage the mitigation measures listed below.

Table 2.2 : Summary of proposed mitigation during operation

Issue	Location of Mitigation Measures	Proposed Mitigation Measures
Air quality	All power plant operation activities related to emissions and dust control	• Routine maintenance checks should be undertaken of all combustion equipment installed at the site including the blackstart diesel generators • Mitigation of discharges from the operational phase of the project has occurred in the Project design stage, and includes high efficiency burners and low emissions of contaminants from natural gas combustion that meet the WBG EHS Thermal Power Guidelines emission limits. • Drift eliminators will be installed on the cooling towers to limit particulate matter discharges from the site.

Issue	Location of Mitigation Measures	Proposed Mitigation Measures
		• All areas not hard paved or gravelled at the site should be subject to landscape planting and grassing to minimise exposed surfaces that could give rise to dust emissions.
Greenhouse Gases		• To mitigate GHG impacts, MRPR shall develop procedures to quantify its annual GHG emissions using established methodologies and report these on an annual basis. • In addition, MRPR should incorporate the following into the ESMS: – Develop a process to identify areas of GHG reduction in the future. – Ensure an environmental management system designed to achieve improved environmental performance is in place
Cultural Heritage	All Project operation activities	• The mitigation measures employed during operation will be the same as those described above for construction (Table 2.1), namely the implementation of the Chance Find Procedure if an asset of cultural heritage value is discovered as part of the operational activities of the power plant or gas pipeline • The Worker's Code of Conduct used during operation will also include a section on the importance of cultural heritage preservation and understanding.
Environmental and Social Management Systems (ESMS)	All Project operation activities	• MRPR will prepare and implement an ESMS for Operation Phase which sets out management plans and procedures that align with the Overarching ESMS. MRPR will also develop an overall organisational structure for environmental and health and safety responsibilities on site. • MRPR, will establish, maintain, and strengthen as necessary an organisational structure that defines roles, responsibilities and authority to implement the ESMS and ESMP in the operation phase. Specific personnel with clear lines of responsibility and authority are designated in this section. Key ESMS responsibilities are defined and will be communicated to the relevant personnel and to the rest of MRPR any maintenance contractors. • Sufficient management sponsorship and human and financial resources will be provided on an ongoing basis to achieve effective and continuous ESMS performance.

Issue	Location of Mitigation Measures	Proposed Mitigation Measures
Hydrology	Power plant operation activities (design mitigation)	• The permanent power plant site and laydown area should have a stormwater system designed to capture and treat any runoff. The diversion drains to divert the overland flow (from the eastern and western catchments) put in place during the construction period will remain and given their performance, should ideally be enhanced from a temporary channel to one that is lined with concrete or rock rip rap. • The stormwater system should be sized to convey runoff, eventually draining to a sump, settling pond or wetland prior to discharge to the receiving environment. This will capture any runoff from the pad and settle out rubbish and sediment, while reducing flow velocities. Design of the settling pond/sump that should receive the stormwater should take into account: – the catchment area draining to the pond; – sediment characteristics that may require settling (i.e. dispersion and particle size assessments); and – design storms duration and velocities • All stormwater ponds should be designed with an emergency spillway to convey a design event when the pond is at capacity, typically a 100 year ARI storm for permanent structures. A wetland could also be considered for treatment of stormwater, if the water quality is acceptable. A serpentine water design will help slow velocities and coupled with a sediment forbay (that is regularly cleaned) will allow treatment and settling of sediment, nutrients and some metals. • Areas of the plant that are at risk of having contaminant discharges (such as oil leaks from vehicles or fluid spills) should be isolated, with their flows first draining through an oil water separator. The outflows from this separator should then drain to the sump/settling pond for further treatment.
Hazardous Substances and Waste	All Project operation activities	MRPR will develop a Hazardous Substances Management Plan/Procedure for operation. This will include the following information: • A register should be held and maintained onsite during construction and operation, which sets out the types, volumes and locations of all hazardous substances. • Safety Data Sheets (SDSs) should be compiled in accordance with the approved code of practice for the preparation of material safety data sheets. • Labels on containers should be compiled in accordance with the approved code of practice for the labelling workplace substances. • Induction and training should be provided to all those employees whose work potentially exposes them to hazardous substances; and those employees who are supervising others who are using hazardous substances at work. • Hazardous substances storage containers (including gas cylinders) which are unsafe (e.g. damaged, leaking etc) should be clearly marked as 'out of service' to prevent them from being used, until their disposal. • Designated stores which are appropriately designed and fire rated should be used to store hazardous substances. • Incompatible substances should be stored separately. • Appropriate bunding should be used when there is a risk of leaks, spills or loss of containment. Bunding needs to be provided for: – All tanks and other vessels containing materials which can cause an environmental, safety or health hazard. – Any other area where spills may occur (e.g. filling stations, decanting areas, drum storage areas etc.). – Bunded areas for tanks should be sized to contain 110% of the largest tank in the bund.

Issue	Location of Mitigation Measures	Proposed Mitigation Measures
		• Level protection (including automatic trips) is required to avoid overflow during the filling of tanks. • Storage areas for hazardous substances (including piping systems) should be inspected on a regular basis to detect spills, leaks and the potential for such occurrences. Any deficiencies found must be recorded and immediately reported to the work area manager in order for the deficiency to be rectified as soon as practicable. • Standard Operating Procedures (SOPs) and/or guidelines (if appropriate, by means of signage) should be prepared and implemented to cover at least the following: – Incompatibility of substances when mixed (e.g. mixing may result in fire or explosion). – Precautions when pouring, decanting or transferring substances. – Steps to be taken in the event of a spill or exposure. – Personal protective equipment to be used with the substance. • Operations which require the mixing of one or more substances should be assessed by personnel with the appropriate handling training prior to work commencement. In addition, areas where mixing and decanting of hazardous substances occur should be fitted with eye wash baths and emergency showers. • Transport of hazardous substances should be carried out in full compliance with the relevant legislative requirements. • Transport vehicles should have appropriate signage and carry documentation on the hazardous substances to be transported. • Arrangements should be in place to ensure that the appropriate spill control equipment for storage and transport (i.e. for water and/or land) is available in sufficient quantities for any foreseeable spills. • Suitable firefighting equipment should also be available to suit the type/s of substances being transported. • Any such equipment should be routinely inspected and maintained in good working order and in a state of readiness. • No chemicals should be accepted onto the Project sites or off-loaded without the relevant health, safety and emergency information being made available by the supplier this includes SDSs. Vehicles and other equipment should be turned off while fuelling operations takes place. • Provisions should be made for the containment, collection and disposal of waste oil and spills that are generated as a result of refuelling activities. Provisions may be in the form of a bunded and impervious area, with a spill and effluent collection system. Alternatively, a portable collection sump should be placed underneath the maintenance and refuelling areas to contain any spillage and/or minor leaks. • MRPR will prepare and implement an emergency response plan/procedure to manage spoils, fires etc., and include warning and evacuation of nearby residences. • Firefighting systems will be fitted as required by the design. • All hazardous waste, including used spill response items, oils and residues, including drums and containers which were used to hold hazardous substances, and sludge removed from septic tanks, should be collected and transported an appropriately licensed hazardous waste disposal facility for disposal.

Issue	Location of Mitigation Measures	Proposed Mitigation Measures
		• A Hazardous Waste Store should be developed at the site during construction for the temporary storage of hazardous wastes generated including contaminated soil waiting to be disposed of offsite to a licensed hazardous waste disposal facility.
Noise and Vibration	Power plant operation activities	• Given the remote locations of the proposed Riau CCPP site, and minimal noise impacts have been predicted, re there is no need for additional mitigation not included in the plant;' inherent design.
Social / Economic	All Project operation works	*Grievance* • The Project will implement regular consultations with project affected people, their grievances will be noted, treated and addressed. • The Grievance Mechanism defined in the Stakeholder Engagement Plan will be disclosed to the neighbouring communities of the power plant and along the gas and water pipeline routes. Grievances received will be registered and addressed on a case by case basis. *Jobs / Employment* • MRPR will design employment and recruitment opportunities that supports the local community. These will be developed via consultations with local stakeholders, Kecamatan/Kelurahan (Village) administration office and other local stakeholders, including woman and vulnerable groups. • MRPR in conjunction with the EPC Contractors will establish a local employment brokerage that will publicise job vacancies in ways and during times that villagers will be able to participate. It is important that the employment process is well managed and that the local community is able to actively participate to the extent feasible. • MRPR will encourage local employment prioritising the three administrative areas: Industri Tenayan, Bencah Lesung and Tuah Negeri along with adjacent villages. Also include the five villages (Meredan, Tualang Timur, Pinang Sebatang, Kuala Gasib, Melebung) and along the gas pipeline route location and Okura village which across the jetty site location. • Local villagers will be informed of job opportunities along with the required qualifications in a timely manner, ensuring the advertising process is culturally and administratively appropriate. • Local businesses will be informed of contracting opportunities in a timely manner. • MRPR will ensure that the hiring process is conducted as transparently as possible to help the community to understand strategic staffing decisions for the Project. • MRPR will develop and monitor an internal standard to guide labour practices and apply this to Supply Chain. • MRPR will develop and implement a Workers Code of Conduct that addresses issues such as anti-social behaviour and drug and alcohol consumption, and respect for women in accordance with the applicable regulation. • MRPR will define targets for the employment of women (at all levels and skills) whenever possible. It will be disclosed that recruitment is also open to women in the local communities. Specific recruitment strategies targeting women will be defined in accordance with the culture, regulation and required qualifications. • MRPR will provide opportunities for women and women groups to participate in the work force, and assist them in having good quality work standards so they can train others and are able to work with other companies in the future. *Skills and Training*

Issue	Location of Mitigation Measures	Proposed Mitigation Measures
		• MRPR will develop a Workforce Development Strategy – a commitment to maximise employment and skills opportunities for local people. • MRPR will design and develop a capacity building program including mentoring, coaching and apprenticeship opportunities for local villagers to maximise skills development for local people. The employment of local villagers for higher level positions should be maximised to facilitate good community relations. • MRPR will make efforts to facilitate the growth and development of new entrepreneurs, both individuals and groups originating from affected communities. *Community Development* • MRPR will establish a Community Development Fund to undertake a range of community development initiatives. • Corporate Social Responsibility (CSR) programmes will be designed and implemented by also coordinating with District (Kecamatan) and Village (Kelurahan) Offices, including in partnership with local agencies to create business opportunities for the local community. The CSR programme will be available to the local community, including the workforce that is no longer involved after the construction of the Project. CSR programmes will also seek to improve levels of education and skills for people affected by the Project. *Health and Social Initiatives* • To prevent social tensions between the workforce and the local population, MRPR will develop a Worker's Code of Conduct. • MRPR will undertake pre- employment screening to ensure employees are fit to work; • MRPR will provide free and anonymous health surveillance and active screening and treatment of workers including sexually transmitted diseases. • MRPR will prevent illness among workers in local communities by undertaking health awareness and education amongst the workforce and in the neighbouring communities. • MRPR will prepare and implement a Sexually Transmitted Disease (STD) Management plan/procedure. • MRPR will collaborate with local authorities to enhance access to public health services and promote immunisation. • MRPR will define and implement measures to prevent vector-borne diseases (such as avoidance of stagnant water, measures to avoid mosquito development). • MRPR will provide adequate and sufficient sanitation facilities for both female and male workers. • Meals provided by MRPR shall be in line with international standards of hygiene and health requirements. *Access and Security* • Access to the power plant site will be controlled with no unauthorised access from local communities permitted. • MRPR will train the security guards on human rights issues. The security guards will not be armed. They will coordinate with local government security forces in case of need and will ensure that security and human rights of members of the local communities' are respected. • A Security Management Plan shall be developed in accordance with national law and the principles of good international industry practice.

Issue	Location of Mitigation Measures	Proposed Mitigation Measures
		• Any worker's accommodation shall be developed according to ADB safeguards and IFC Performance Standard 2 and ensure there is no race discrimination for basic services for accommodation and healthy meals provided by the company
Soils, Geology and Groundwater	Power plant operation activities	• Mitigation measures have been built into the design of the power plant to help reduce the risk of accidental contamination spill occurring. In the unlikely event that an accidental contamination spill does occur, and the mitigation measures built into the design of the power plant, such as bunding, do not stop the contaminants from entering the underlying soils, all contaminated soil should be excavated and replaced with clean fill to limit the likelihood of groundwater contamination occurring. The excavated soil should be disposed of off-site in accordance with relevant regulatory guidelines. • MRPR will develop a Hazardous Substances Management plan/procedure, which outlines mitigation measures will be produced and implemented. For further details of mitigation measures, reference should be made to mitigation outlined for Hazardous Substances and Waste. • Spill kits should be located on the construction site to manage and contain any fuel or hazardous substance spillage. If an accident does occur, then contaminated soil should be excavated and replaced with clean fill to minimise (or prevent) groundwater contamination with treatment of any stormwater runoff or process water prior to disposal. • All wastewater should be collected and treated prior to discharge. • Oily and/or hazardous waste will be separately collected and disposed of by an appropriately licensed operator. • All vehicle maintenance should be done in garages.
Terrestrial Ecology	Power plant	• There should be provision of wetland areas and swamp forest within the green zones of the CCPP. This is likely to be approximately 3.5 ha of habitat provided on completion of the construction phase.
Traffic Management	Power plant operation activities	• A Travel Plan should be distributed to staff to inform them of the best ways to travel to the sites of the Project. Staff should be encouraged to take public transport, car pool or that the contractor provides transport for them.
Working Conditions, Occupations and Safety	All operation activities	• MRPR will be required to develop an Occupational Safety and Health Management System (OSHMS) for the operation and maintenance of the pipeline and power plant, which will apply to all personnel involved in the Project, including subcontractors and part-time workers. The primary health and safety objectives will be to ensure effective measures and management of occupational health and safety to minimise workplace accidents and injuries. The health and safety procedures within OHSMS will meet the requirements specified in the WBG Environmental, Health and Safety Guidelines pertaining to occupational safety and health. In addition, any Subcontractors appointed by MRPR will be required to submit their own. • MRPR should establish a hierarchy of responsibility with regards for the provision of health and safety. • The OHSMS will have a procedure for identifying all hazards associated with the activity in question. A hazard in this context is defined as any aspect of the Project activities which could result in harm to onsite personnel. • A Health and Safety Management Committee should be appointed to evaluate health and safety at the site and to assess and recommend changes to equipment, policy and/or procedures where required by health and safety issues. • Staff should be trained in safety procedures and provided with PPE. Working conditions and occupational safety and health procedures framework has been outlined in the ESIA Volume 5: Appendices, Technical Report - Working Conditions, Occupational Safety and Health. • The Worker's Grievance Mechanism will continue to run throughout operational period.

2.5 Monitoring

A recommended monitoring programme is set out in the ESMP. This is designed to conduct sufficient monitoring in order to demonstrate compliance with Indonesian regulatory discharge limits and ambient standards and the applicable WBG EHS Guidelines standards specified for the receiving environments (air, water, soil, etc.). The monitoring programmes will also assess the performance of containment and treatment systems at the power plant during construction and operation and for the construction of the pipeline.

The Monitoring Procedures will set out the location of the sampling points, sampling methodology to be used (grab samples, automated etc.), number of samples to be collected each round, frequency of sampling, sample handling and preservation, parameters to be analysed for and analytical methods, and reporting requirements. This monitoring will include, but will not be limited to:

- Regular monitoring of in stream water quality and of stormwater discharged into the environment from the stormwater sumps, during all seasons;
- Groundwater levels and quality;
- Traffic management measures;
- OHS performance;
- Waste generation;
- Noise and ambient air quality; and
- Social surveys and changes monitoring.

This environmental monitoring for the construction and operation phases is set out in Table 2.3 and Table 2.4.

2.6 Construction Monitoring

Table 2.3 : Monitoring activities during construction

Issue	Location of Monitoring	Proposed Monitoring Measures	Responsibility of monitoring
Air quality	All construction works	• As part of good working practice the construction managers should complete routine checks on dust generation from construction activities, and confirm that dust suppression and appropriate storage is being used where required. In addition, a mechanism for complaints regarding dust will be available to locals, and due regard given to any issues raised.	LEC and CPM to implement monitoring and MRPR to review performance
Terrestrial Ecology	Gas pipeline route	• A pre-construction survey should be undertaken along the confirmed pipeline route sections where there is currently a number of options being considered if the selected option has not been previously surveyed. This monitoring is to identify any potential vulnerable/ critically endangered flora and fauna and where possible capture and relocate fauna. • A terrestrial ecology survey should be conducted in the three areas adjacent to the gas pipeline route that have been identified as potentially critical habitat prior to construction of that segment in order to identify and relocate as applicable endangered species further away from the construction area.	MRPR to implement
Cultural Heritage	All construction works	• No monitoring measures are proposed during construction, with the exception of MRPR ensuring the implementation of the Chance Find Procedure.	LEC and CPM to implement monitoring and MRPR to review performance
Environmental and Social Management System (ESMS)	All construction works	• The ESMS will set out MRPR's policies and procedures for managing, mitigating and monitoring environmental and social impacts. Monitoring will be carried out in order to determine whether environmental and social outcomes are being achieved. Monitoring requirements will be specified in a monitoring plan (or plans), which identify: - the type of monitoring that is to be carried out; - where monitoring is to take place; - how frequently monitoring will be carried out; - the parameters that will be tested for; - the applicable objectives and performance standards; and - who will conduct the monitoring. • Reviews of the ESMS will be conducted throughout construction and operation of the Project and where necessary changes should be made to the documentation to ensure that it remains relevant. For instance, once construction has been completed, the construction related environmental and social aspects will no longer be relevant. • MRPR will be responsible for overall monitoring and reporting every six months to relevant authorities regarding the findings of the reports.	MRPR to responsible for monitoring overarching ESMS and EPC contractor's construction ESMS.

Issue	Location of Monitoring	Proposed Monitoring Measures	Responsibility of monitoring
Hazardous Substances and Waste	All construction works	• The amount and the disposal destination of the hazardous wastes should be recorded and monitored. • A record of all spillages should be maintained. • All bund enclosures should be regularly inspected for water and sheens prior to the collected water being discharged. • Regular inspection of storage facilities should be undertaken to check for leaks, spills and inappropriate storage practices. • Regular inspections should be undertaken of waste collection skips, to check wastes are being separated correctly and hazardous wastes are not being included with non-hazardous will be undertaken on a weekly basis. The inspection should also include a check of the waste skips and bins condition to be sure waste is being held securely and not able to impact the environment through leakage or being blown away.	LEC and CPM to implement monitoring and MRPR to review performance
Hydrology	All construction works	• Visual monitoring of stream banks and the construction of diversion channels should be undertaken to identify any areas that may be performing inadequately (resulting in bank collapses, localised erosion hot spots and scouring). • Monitoring of the effectiveness of the settling pond or wetland on sediment should be undertaken during construction and ongoing operations, with spot samples assessed for Total Suspended Solids (TSS) at the inlet and outlet locations. Imhoff settling cones offer a cheap and viable method for quick onsite estimates of TSS from the inlet and outlet.	LEC and CPM to implement monitoring and MRPR to review performance
Noise and Vibration	Power plant site	• Noise monitoring should be undertaken on a fortnightly basis at nearby residential areas at the same locations as that undertaken for the baseline surveys in order to: – Continue the collection of noise data throughout construction, to check that noise criterion is being complied with. – Evaluate the success of mitigation measures, or compliance with project standards or requirements. – Assess whether there are impacts occurring that were not previously predicted. – In some cases, it may be appropriate to involve local communities in monitoring efforts through participatory monitoring. In all cases, the collection of monitoring data and the dissemination of monitoring results should be transparent and made available to interested project stakeholders. – Results of monitoring to be reported to MRPR in monthly Environmental and Social Performance Reports	LEC and CPM to implement monitoring and MRPR to review performance
	Gas pipeline	• Spot monitoring should be undertaken along the gas pipeline while construction works are occurring near residential locations previously monitored for baseline surveys.	CPM to implement monitoring and MRPR to review performance
Water Quality and Aquatic Ecology	Construction and use of temporary jetty on the Siak River	• Daily observations should be made during in river works to visually assess whether sediment plumes are being generated and to modify the sediment controls to minimise effects. Records will be made of observations and any changes to controls undertaken.	LEC to implement monitoring and

Issue	Location of Monitoring	Proposed Monitoring Measures	Responsibility of monitoring
			MRPR to review performance
	Gas pipeline construction	• Daily observations should be made during in stream works to visually assess whether sediment plumes are being generated and to modify the sediment controls to minimise effects. Records should be made of observations and any changes to controls undertaken.	CPM to implement monitoring and MRPR to review performance
	All construction works	• Inspection and maintenance – the ESCP should specify who is responsible for inspecting all physical elements of the erosion and sediment control measures. These should be inspected daily to ensure they are installed and working correctly. Any defects should be rectified before earthworks occur in that area of the site. Accumulated sediment shall be removed from all features when it reaches 25% of the available space. Records of all inspection and maintenance should be kept. • The discharge from the sedimentation ponds should be monitored during rain events. At least once per month for total suspended solids for comparison with the discharge limit of 50 mg/l and to determine the effectiveness of the pond.	LEC and CPM to implement monitoring and MRPR to review performance
Social	All construction works	• Monitor the number of people being employed by the project from the following villages Industri Tenayan, Bencah Lesung, Tuah Negeri, Maredan, Kuala Gasib, Pinang Sebatang, Tualang Timur, Melebung and Okura. This should be compared to predicted numbers of employees. • Surveys will be conducted to determine the number of new businesses generated by the development and the level of indirect employment. • Monitor the recruitment process and the EPC contractor's implementation of employment, health and safety, security mitigation. • The MRPR Community Liaison Officer will be responsible for updating and monitoring the implementation of the LRP (and RAP if required) and Grievance Mechanism defined in the Stakeholder Engagement Plan. • MRPR and the EPC contractors shall monitor and compare the project to the ADB safeguards on a quarterly basis. • An independent third party review is recommended of the effective implementation of the LRP (and RAP if required), one year after civil construction works commence at the power plant and gas pipeline site. • Ongoing consultation and communication with the local community will be required particularly with project affected people, vulnerable groups and key stakeholder groups. The minutes of meetings and signed lists of attendees will be completed and documented.	LEC and CPM to implement monitoring and MRPR to review performance
Soils, Geology and Groundwater	Power plant construction	• To assess the effects of localised dewatering operations at the site a minimum of four groundwater level monitoring wells should be installed around the boundary of the site. These should be installed after the cut and fill operations but prior to foundation construction to minimise the risk of them being damaged, and so that they reflect the post earthworks water table. Should groundwater levels reduce by more than 0.5 m at the property boundary, then the monitoring of the eight neighbouring wells within 500 m of the site shall be implemented.	LEC to implement monitoring and MRPR to review performance

Issue	Location of Monitoring	Proposed Monitoring Measures	Responsibility of monitoring
		• Any wells identified as being used for domestic purposes within a 250 m radius of the Power Plant site should be monitored on a monthly basis for a suite of contaminants. • Dewatering discharges should be monitored in accordance with WBG EHS Guidelines for liquid effluents	
	Gas pipeline construction	• Wells within a close proximity radius to the open trench for the gas pipeline should be monitored for water level and water quality once whilst construction is directly adjacent.	CPM to implement monitoring and MRPR to review performance
Traffic Management	All construction works	Monitoring of construction traffic and traffic management measures should occur to ensure compliance with the traffic management requirements outlined within the TMP. Activities to be monitored include: • Construction traffic movements to ensure truck drivers use the designated routes; • Traffic incidents/complaints from the public or officials to ensure that unpredicted changes in travel time due to incidents such as, for example traffic accidents, emergencies, natural disasters can be managed by specially trained personnel; and • Public roads to ensure that the roads in the vicinity of the site are clean at all times of clay, slurry or materials from the site. • Monitor the safety performance of the local roads, and where necessary make physical changes to improve safety or encourage road user behavioural changes.	LEC and CPM to implement monitoring and MRPR to review performance
Working Conditions, Occupations and Safety	All construction works	• The EPC Contractors will undertake regular safety inspections and monitoring of exposure to hazards. This will include the state of the site as well as the maintenance of equipment and a comparison to internationally published exposure guidelines. • The Site Manager shall instigate measures to correct non-conformance in safety performance found during safety checks and inspections. A record of the safety checks and inspections, and resulting actions, shall be provided to the Health and Safety Management Committee every month. • MRPR, as principals, undertake independent audits of the EPC Contractors and their Subcontractor's Health and Safety performance to ensure that the health and safety practices as set out in their health and safety plans are being complied with. The audits will also check that no unsafe practices are being carried out at site. If unsafe practices are identified during the audits, work at the site should cease. The audits should be carried out once every two months. • All staff at MRPR and the EPC Contractors should be notified of all incidents/accidents which result in first aid treatment during the construction of the pipeline and power plant. Minor incidents along with the incident/accident investigation report should be supplied to MRPR once a month. Serious accidents that are Lost Time Incidents, or result in serious harm or a fatality should be reported immediately to MRPR. • Notification of accidents and incidents at the site during construction provide another means of monitoring the Contractor's safety performance.	LEC and CPM to implement monitoring and MRPR to review performance

DRAFT Environmental and Social Impact Assessment Report

Project Number: 50182-001
May 2017

INO: Riau Natural Gas Power Project
ESIA Vol.3&4_SIA & ESMP and Framework ESMS

Prepared by ESC for the Asian Development Bank

2.7 Operational Monitoring

Table 2.4 : Monitoring activities during operation

Issue	Location of Monitoring	Proposed Monitoring Measures
Air quality	Power Plant operation activities	• The Project will include an environmental monitoring programme, which will include a Continuous Emissions Monitoring System (CEMS) for continuous monitoring of gases discharged from both stacks, including measurements of oxygen, carbon dioxide, nitrogen oxides and temperature. • It is recommended that ambient air monitoring for NO_2 should be undertaken in the area surrounding the power plant at two locations, with sampling carried out using passive and manual methods on a monthly basis. Alternatively, a permanent continuous ambient air monitoring unit for NO_2 which utilises electro chemical cell non-reference method could be installed at one location where the highest concentration of NO_2 as a 24-hour average is predicted to occur, subject to land acquisition and security arrangements. • To monitor GHG impacts, MRPR shall monitor and report on emissions in accordance with Annex A of the Equator Principles (2013)
Environmental and Social Management Systems (ESMS)	All Project operation activities	• During operation, monitoring of an operational ESMS will be carried out as described above for construction activities.
Hazardous Substances and Waste	Power plant operation activities	• To ensure the processes and procedures are operating effectively, MRPR will conduct regular audits of hazardous substance storage and the operation of the Hazardous Substance Management Plan. Audits will involve reviewing storage procedures, ensuring staff are appropriately trained and supervised, ensuring materials are stored and used in accordance with good international industrial practice, and identifying and recommending any areas for continual improvement. • As part of the Waste Management Plan a monitoring plan will be developed to inspect waste collection skips, to check wastes are being separated correctly and hazardous wastes are not being included with non-hazardous. The inspection should also include a check of the waste skips and bins condition to be sure waste is being held securely and not able to impact the environment through leakage or being blown away. • Records will be kept on the types of wastes generated, the volume generated and the location/volume of waste disposed off-site. Types and volumes of hazardous waste must be recorded and destruction certificates obtained from the hazardous waste removal contractor.
Noise and Vibration	Power plant operation activities	• Direct observation of machine maintenance should be made to ensure that any noise-creating faults are treated.
Water Quality and Aquatic Ecology	Power plant operation activities	• Visual inspection of oil interceptors for visible oil and settling ponds. • Monitoring of the discharge from oil interceptors and settling ponds every three months (with comparison to WBG EHS Discharge Guidelines).
Social	All Project operation activities	• Monitor the number of people being employed by the project from the following villages Industri Tenayan, Bencah Lesung, Tuah Negeri, Maredan, Kuala Gasib, Pinang Sebatang, Tualang Timur, Melebung and Okura. This should be compared to predicted numbers of employees. • Surveys should be conducted to determine the number of new businesses generated by the development and the level of indirect employment.

Issue	Location of Monitoring	Proposed Monitoring Measures
		• MRPR's Community Liaison Officer will be responsible for updating and monitoring the implementation of the LRP (and RAP if required) and Grievance Mechanism defined in the Stakeholder Engagement Plan. • Ongoing consultation and communication with the local community will be required particularly with project affected peoples, vulnerable groups and key stakeholder groups. The minutes of meetings and signed lists of attendees will be completed and documented. • During operation, on a quarterly basis, the number of regular and ad-hoc meetings with communities will be recorded, as well as the minutes of meetings and signed lists of attendees. • During operation, the number of consultations with project affected parties and number grievances received, treated and solved will be recorded through minutes of meetings and signed lists of attendees. • The Grievance database will be monitored with progress reported on a quarterly basis.
Soils, Geology and Groundwater	Power plant operation activities	• Any wells identified as being used for domestic purposes within a 250 m radius of the Power Plant site should be monitored on a six monthly basis for a suite of contaminants.
Working Conditions, Occupational Health and Safety	All operation works activities	• The Occupational Health and Safety Management System will include a schedule of regular safety inspections and monitoring of exposure to hazards. This will include the state of the site as well as the maintenance of equipment and a comparison to internationally published exposure guidelines. • The Site Manager should instigate measures to correct non-conformance in safety performance found during safety checks and inspections. A record of the safety checks and inspections, and resulting actions, shall be provided to the Health and Safety Management Committee every month. • MRPR will undertake audits to check that no unsafe practices are being carried out at site. If unsafe practices are identified during the audits, work at the site should cease. The audits should be carried out once every two months. • All staff should notify MRPR of all incidents/accidents which result in first aid treatment during the operation of power plant. Minor incidents along with the incident/accident investigation report should be supplied to MRPR HSE Manager once a month. Serious accidents that are Lost Time Incidents, or result in serious harm or a fatality should be reported immediately to MRPR's HSE Manager. • Worker occupational monitoring such as hearing and vision should be undertaken on an annual basis.

3. Framework Environmental and Social Management System

3.1 What is an EMS?

An ESMS is designed to establish a methodological approach to managing environmental and social risks and impacts in a structured way, on a continuous basis. The goal of an ESMS is to make sure that there are appropriate environmental and social policies and procedures in place and that people consistently follow them. A key feature is the idea of continual improvement – an ongoing process of reviewing, correcting and improving the system. The most common method is the Plan-Do-Check-Act cycle (PDCA), shown below in Figure 3.1.

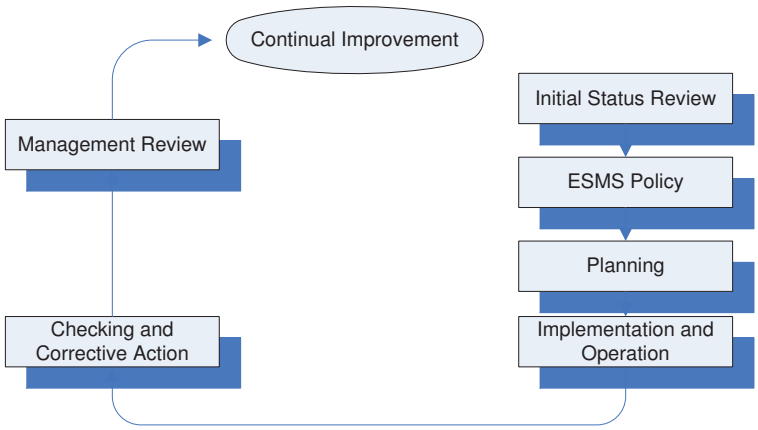


Figure 3.1 : Elements of an Environmental and Social Management System

The resources needed are planned, provided and managed to support the management plans and programs implemented during the construction phase of the Project. Monitoring and measurements are done in order to track MRPR's environmental and social performance, as well as feedback from the stakeholders. Information will be gathered from monitoring and measurements are analysed and presented to the MRPR Management Team. The MRPR's Management Team will then review and the implement the ESMS systems and prepares plans for continual improvement of MRPR's environmental and social performance.

3.2 Structure of the ESMS

The structure of the ESMS that will be implemented for the construction and operation of the Project is shown in Figure 3.2 below:

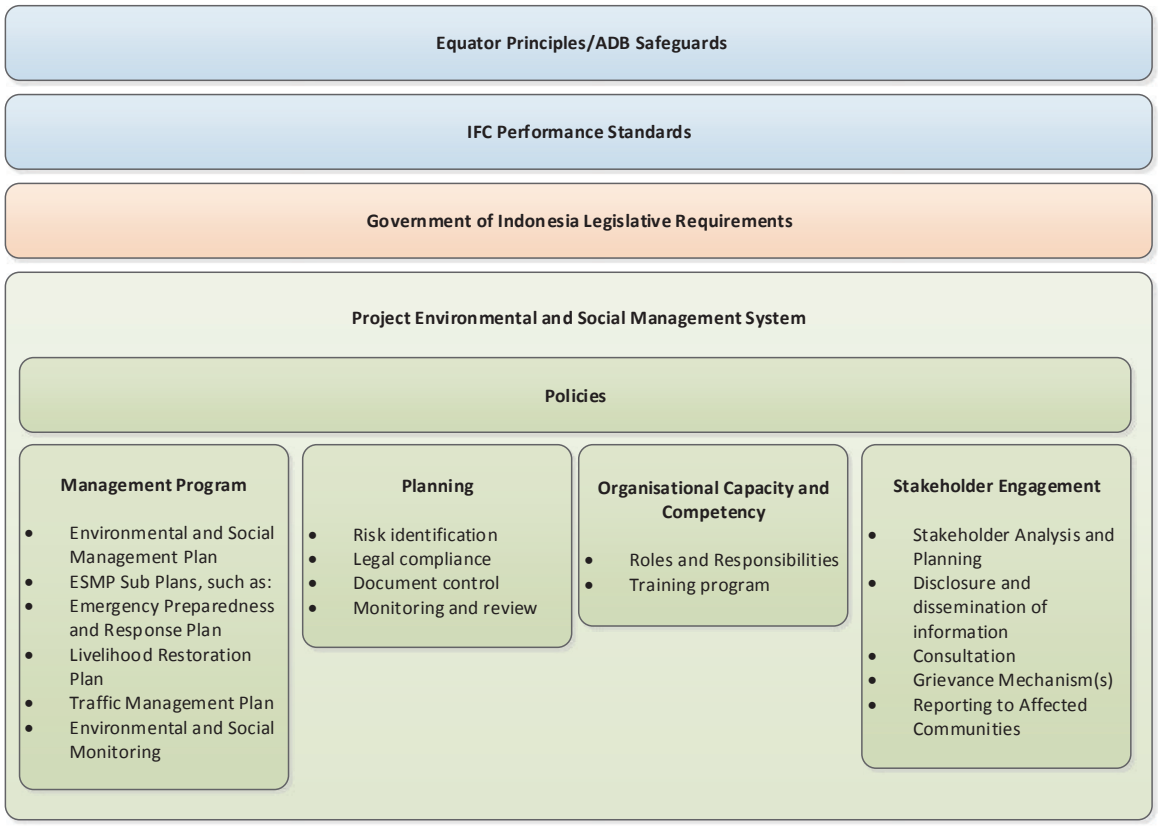


Figure 3.2 : Structure of ESMS

3.3 Alignment with the Equator Principles

In accordance with International Finance Corporation (IFC) Performance Standard 1 the structure of the ESMS incorporates the following elements, as shown in Table 3.1:

Table 3.1: Alignment with the Equator Principles

Equator Principle for ESMS	Description
Policy	Policies that define MRPR's environmental and social commitment/objectives and the principles that guide the project to achieve sound environmental and social performance are described in Section 3.4.
Identification of Risks and Impacts	The process for identifying and assessing environmental and social risks is described in ESIA Volume 1: Introduction, ESIA Volume 2: EIA and ESIA Volume 3: SIA. The primary mechanism is the completion of an Environmental and Social Impact Assessment for the construction and operation of the Project.
Management Programmes	The management programmes used to mitigate potential environmental and social risks and impacts are described in section 3.8 and assessment against ADB standards in section 4. This includes preparation of an ESMP, which will contain procedures/plans to address specific issues in the appropriate level of detail.
Capacity/Competency	The roles, responsibilities and authorities for implementation of the ESMS are defined in Section 3.5 and training requirements are described in Section 3.11.

Equator Principle for ESMS	Description
Emergency Preparedness/Response	Emergency preparedness and response is addressed in ESIA Volume 5: Technical Appendices, Technical Report – Working Conditions, Occupational Health and Safety, as part of the Management Programmes that are applicable to the construction and operation of the Project.
Monitoring and Review	Section 3.9 describes the monitoring that will be carried out to ensure environmental and social performance standards are being met and the ESMS is being implemented effectively.
Stakeholder Engagement Communications and Grievances Reporting to Affected Communities	An overview of stakeholder engagement is provided in Section 3.10, which addresses: • Stakeholder analysis and planning • Disclosure and dissemination of information • Consultation and participation • Grievance mechanism • Reporting to affected communities.

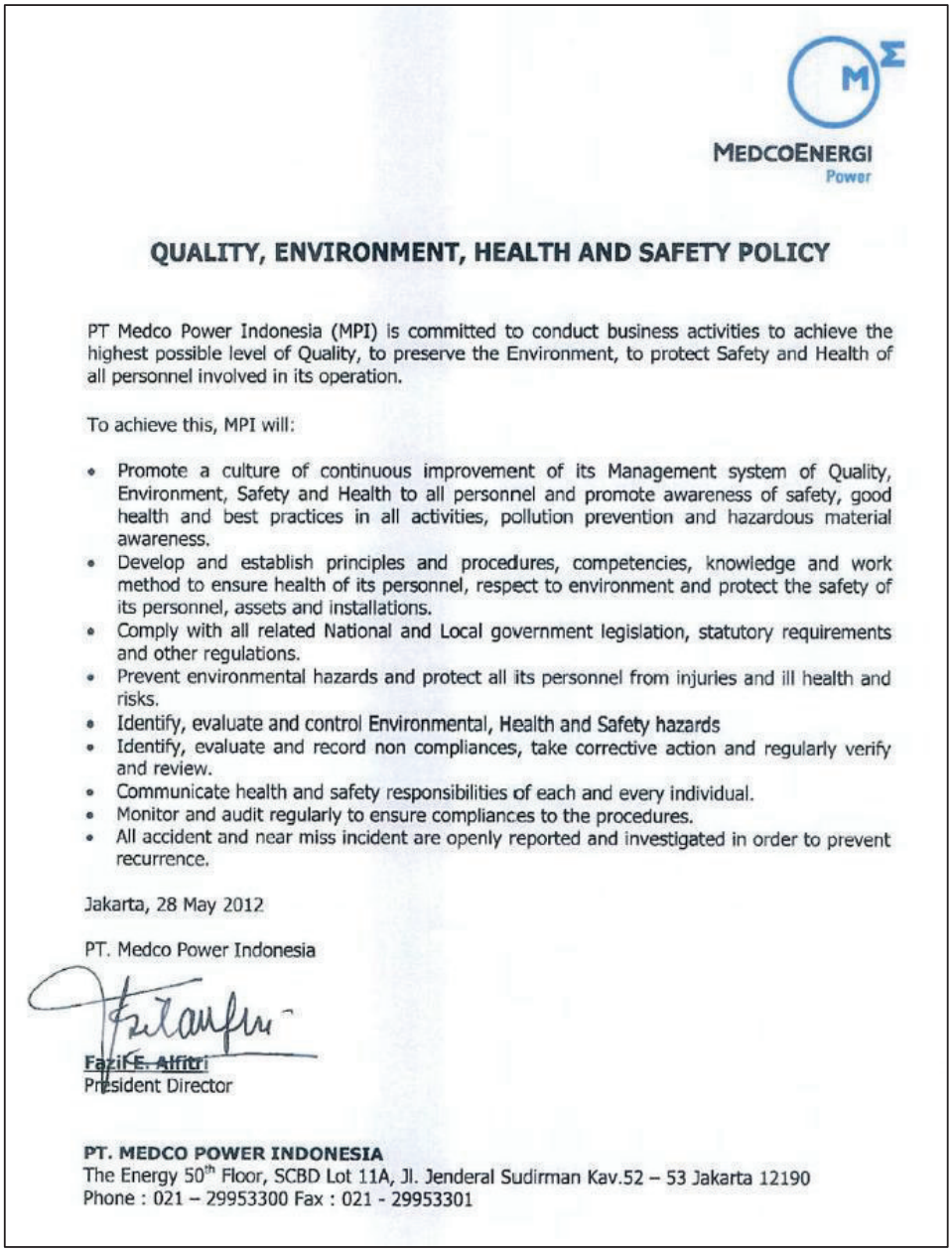
The ESMS is a 'living' document, which will be reviewed and updated in accordance with the ESMS Management Review Procedure to ensure it maintains its relevance. At a minimum the ESMS will be reviewed by MRPR management before commencing each new phase of work and on an annual basis.

3.4 Policies

3.4.1 MRPR Environmental, Social, Health and Safety Policies

At the time of writing this report MRPR, as a joint venture, is in the development stage and therefore, in the process of developing HSE policies and procedures. These will be developed based on the existing MEDCO and RATCH HSE policies and procedures.

However, we have been advised that as part of the joint venture between MEDCO and RATCH, MEDCO will be more responsible for the operational functions of the power plant. As such the MEDCO policies and procedures, rather than RATCH's, have been included below to provide an indication of content for the MRPR policies and procedures still to be developed. MEDCO's commitment to HSE is outlined in their HSE Policy below:



MEDCOENERGI
Power

QUALITY, ENVIRONMENT, HEALTH AND SAFETY POLICY

PT Medco Power Indonesia (MPI) is committed to conduct business activities to achieve the highest possible level of Quality, to preserve the Environment, to protect Safety and Health of all personnel involved in its operation.

To achieve this, MPI will:

- Promote a culture of continuous improvement of its Management system of Quality, Environment, Safety and Health to all personnel and promote awareness of safety, good health and best practices in all activities, pollution prevention and hazardous material awareness.
- Develop and establish principles and procedures, competencies, knowledge and work method to ensure health of its personnel, respect to environment and protect the safety of its personnel, assets and installations.
- Comply with all related National and Local government legislation, statutory requirements and other regulations.
- Prevent environmental hazards and protect all its personnel from injuries and ill health and risks.
- Identify, evaluate and control Environmental, Health and Safety hazards
- Identify, evaluate and record non compliances, take corrective action and regularly verify and review.
- Communicate health and safety responsibilities of each and every individual.
- Monitor and audit regularly to ensure compliances to the procedures.
- All accident and near miss incident are openly reported and investigated in order to prevent recurrence.

Jakarta, 28 May 2012

PT. Medco Power Indonesia

Fazil E. Alfitri
President Director

PT. MEDCO POWER INDONESIA
The Energy 50th Floor, SCBD Lot 11A, Jl. Jenderal Sudirman Kav.52 – 53 Jakarta 12190
Phone : 021 – 29953300 Fax : 021 - 29953301

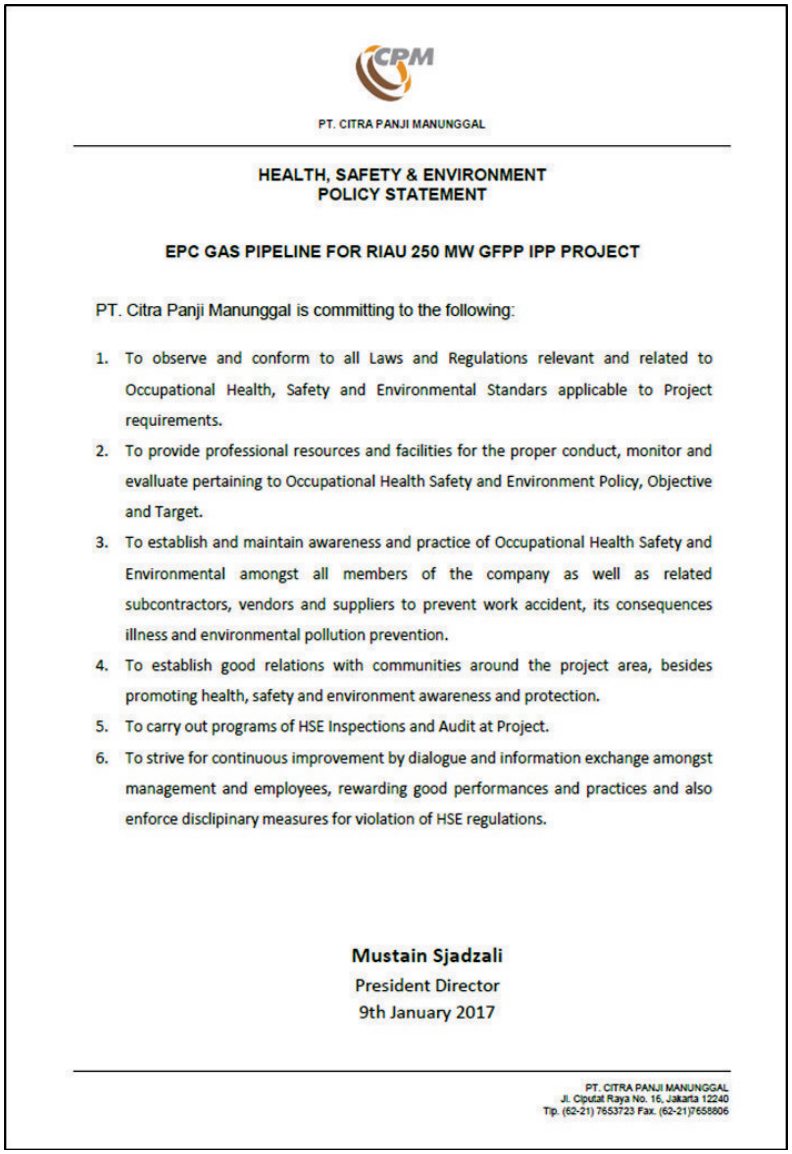
Figure 3.3 : Medco HSE Policy

3.4.2 EPC Contractor Policies

During construction, separate policies, plans and procedures relating to assessment, monitoring and control of environmental and social aspects will be prepared and implemented by the EPC contractors (Lotte Engineering & Construction and Citra Panji Manunggal). These policies, plans and procedures will align with MRPR's overarching ESMS, which will cover both construction and operation phases.

Citra Panji Manunggal (CPM) Policies

For this Project construction of the gas pipeline will be managed by CPM whose commitment to HSE is outlined by their project specific HSE and Drugs and Alcohol policy statements below.



PT. CITRA PANJI MANUNGGAL

HEALTH, SAFETY & ENVIRONMENT POLICY STATEMENT

EPC GAS PIPELINE FOR RIAU 250 MW GFPP IPP PROJECT

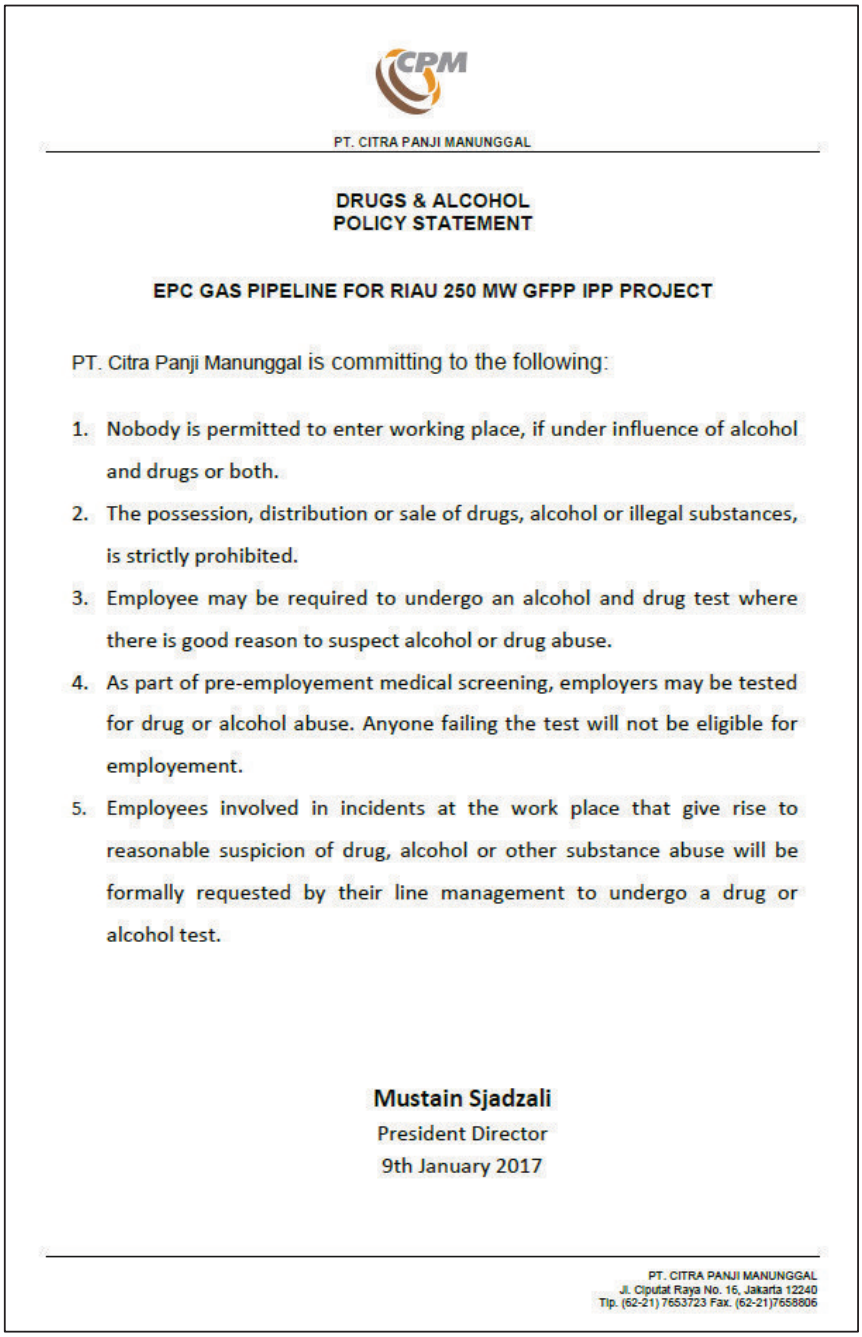
PT. Citra Panji Manunggal is committing to the following:

1. To observe and conform to all Laws and Regulations relevant and related to Occupational Health, Safety and Environmental Standars applicable to Project requirements.
2. To provide professional resources and facilities for the proper conduct, monitor and evalluate pertaining to Occupational Health Safety and Environment Policy, Objective and Target.
3. To establish and maintain awareness and practice of Occupational Health Safety and Environmental amongst all members of the company as well as related subcontractors, vendors and suppliers to prevent work accident, its consequences illness and environmental pollution prevention.
4. To establish good relations with communities around the project area, besides promoting health, safety and environment awareness and protection.
5. To carry out programs of HSE Inspections and Audit at Project.
6. To strive for continuous improvement by dialogue and information exchange amongst management and employees, rewarding good performances and practices and also enforce disciplinary measures for violation of HSE regulations.

Mustain Sjadzali
President Director
9th January 2017

PT. CITRA PANJI MANUNGGAL
Jl. Ciputat Raya No. 16, Jakarta 12240
Tlp. (62-21) 7653723 Fax. (62-21)7658606

Figure 3.4 : CPM HSE policy statement



PT. CITRA PANJI MANUNGGAL

DRUGS & ALCOHOL POLICY STATEMENT

EPC GAS PIPELINE FOR RIAU 250 MW GFPP IPP PROJECT

PT. Citra Panji Manunggal is committing to the following:

1. Nobody is permitted to enter working place, if under influence of alcohol and drugs or both.
2. The possession, distribution or sale of drugs, alcohol or illegal substances, is strictly prohibited.
3. Employee may be required to undergo an alcohol and drug test where there is good reason to suspect alcohol or drug abuse.
4. As part of pre-employement medical screening, employers may be tested for drug or alcohol abuse. Anyone failing the test will not be eligible for employement.
5. Employees involved in incidents at the work place that give rise to reasonable suspicion of drug, alcohol or other substance abuse will be formally requested by their line management to undergo a drug or alcohol test.

Mustain Sjadzali
President Director
9th January 2017

PT. CITRA PANJI MANUNGGAL
Jl. Ciputat Raya No. 16, Jakarta 12240
Tlp. (62-21) 7653723 Fax. (62-21)7658806

Figure 3.5 : CPM Drugs and Alcohol policy statement

Lotte Engineering & Construction (LEC) Policies

For this Project construction of the power plant, switchyard, transmission line, water supply and discharge structures and pipelines, will be managed by (LEC). Their commitment to HSE is outlined by their HSE policy below.

LOTTE E&C	HSE Policy	Date of Legislation	01.Jan.2018
		Date of Amendment	-
		Rev. No	0
		Page	1 / 2

In its management system and business activities, Lotte Engineering & Construction Co., Ltd. (LEC) is committed to ensure the prevention and protection of employees from causes of injury and ill health: and to continually improve occupational health, safety and environment management and performance by working towards HSE objectives and targets.

This policy is mandatorily applicable to anyone who enters any LEC facility, site or project : which includes its Employees, contractors, suppliers or any other party.

Commitment of LEC & Its Top Management :

1. To provide human and material resources and training in safe work practices, to all staff.
2. To manage the prevention of incidents, injuries and ill health due to occupational causes.
3. To hold each staff member accountable for the performance of Health, Safety & Environment (HSE) in their respective functional areas.
4. To engage in safe work habits in an environmentally responsible manner as a pre-condition to employment.
5. To comply with International environmental, health and safety regulations and minimize sources of hazard and its adverse impact on people and environment; ensuring a safe and healthy work place in all Lotte facilities.

The Chairman of LEC has issued the following guidelines for compliance by all staff member in their commitment to health, safety and environmental protection.

Managers / Supervisors are required to :

1. Establish health, safety and environment objectives and lead by example.
2. Ensure all employees are competent and understand their responsibilities and we given HSE orientation and training.
3. Identify and communicate all hazards and risks to employees regarding their jobs.
4. Provide employees with practices, procedures and tools to perform their work in a safe and environmentally responsible manner to prevent injuries, ill health and pollution of the environment.

* Statement :- The policy will be updated every 1 year.
FOR MORE INFORMATION CONTACT:
NAME: Hyung-Jin, Kim - HSE MANAGER, EMAIL : (hjkim39@lotte.net)

HSE Policy

Document Code : LECS-OS-01-01-01
Date of Legislation: 01.Jan.2018
Date of Amendment : -

Lotte Engineering & Construction Co., Ltd.
50-2 Lotte Welfare Center Bldg., Jamwon-dong, Seocho-gu, Seoul, Korea
Tel +82-2-3480-9225 Fax +82-2-3480-9982

LOTTE E&C	HSE Policy	Date of Legislation	01.Jan.2018
		Date of Amendment	-
		Rev. No	0
		Page	2 / 2

5. Ensure all employees and contractors perform their duties in a safe and environmentally responsible manner.
6. Take immediate action on HSE issues and recognize all report as serious until the problem is resolved after being investigated thoroughly.

Employees are required to :

1. Comply with relevant regulations, HSE corporate policies, practices and procedures.
2. Be accountable for their own personal health and safety ; as well as for that of their co-worker.
3. Immediately report any unsafe or hazardous work conditions, near misses and incidents.
4. Stop any operation that is detrimental to health, safety or the environment.

Project and operation managers are responsible for the implementation of all the Health and Safety programs and procedures, and are evaluated and measured on their support of these.

Every employee of the company is responsible for complying with Environment, Health and Safety Program and procedures developed and put in place by HSE Dept.

HSE Department is responsible for the development of HSE programs and procedures, oversight of policy implementation, and to assist project and operations managers in its implementation.

President
Seok-Ju, Ha

* Statement :- The policy will be updated every 1 year.
FOR MORE INFORMATION CONTACT:
NAME: Hyung-Jin, Kim - HSE MANAGER, EMAIL : (hjkim39@lotte.net)

3.5 Roles and Responsibilities

During construction and operation, MRPR, in collaboration with EPC Contractor's and Subcontractors, will establish, maintain, and strengthen as necessary an organisational structure that defines roles, responsibilities and authority to implement the ESMS and the mitigation and monitoring measures as set out in the ESMP. Key ESMS responsibilities are defined and will be communicated to the relevant personnel and to the rest of MRPR, as well as the EPC Contractor's and any Subcontractors. Sufficient management sponsorship and human and financial resources will be provided on an ongoing basis to achieve effective and continuous ESMS performance. Specific personnel with clear lines of responsibility and authority are designated in this section.

3.5.1 Construction Phase

Management of environmental and social risks and impacts during construction on a day to day basis will primarily be the responsibility of the EPC Contractors.

During the construction phase, MRPR will review and monitor EPC Contractors' performance in accordance with their Health and Safety and Environment (HSE) Plans and related management plans/procedures to ensure alignment with this overarching ESMS. MRPR is responsible to report every six months to relevant authorities and the Lenders regarding the environmental and social performance being achieved by the Project.

LEC roles and responsibilities

The key LEC personnel responsible for ensuring good environmental practice on site during construction as listed in the LEC HSE Plan will be the Project Director, Site Manager, HSE Manager, HSE Officer/Supervisor and subcontractors. Figure 3.6 sets out an example HSE organisational chart and the HSE Committee Structure. The final organisational structure will need to be confirmed prior to construction. Table 3.2 provides example of further roles for the implementation of the ESMS.

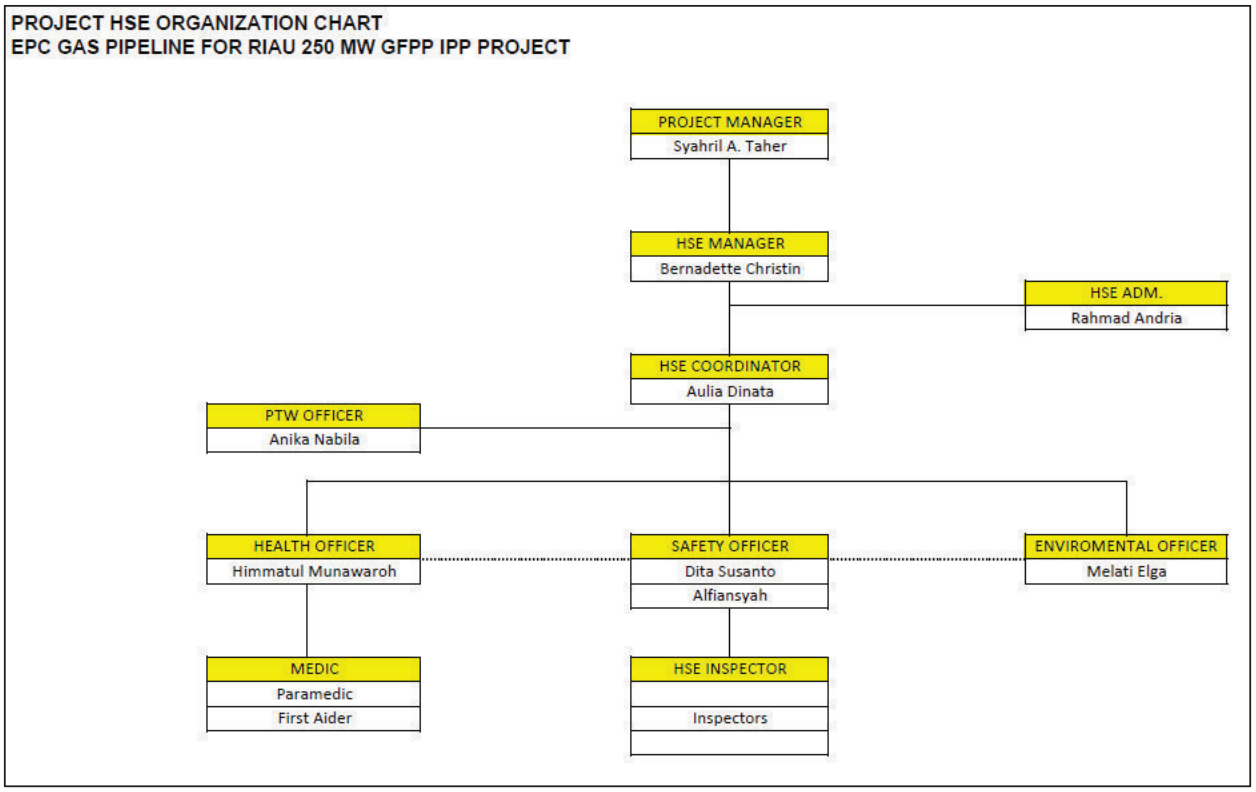


Figure 3.6 : Example LEC HSE organisational chart

CPM Roles and Responsibilities

The key CPM personnel responsible for ensuring good environmental practice on site during construction as listed in the CPM HSE Plan will be the Project Manager, HSE Manager, Construction Manager, Project HSE Coordinator, Environmental Officer, Safety Officer, Work Permit Officer, Health Officer, HSE Inspectors and all employees and subcontractors. Figure 3.6 sets out the proposed CPM organisational structure for managing health, safety, environmental and social performance during construction. Table 3.2 provides example of further roles for the implementation of the ESMS.

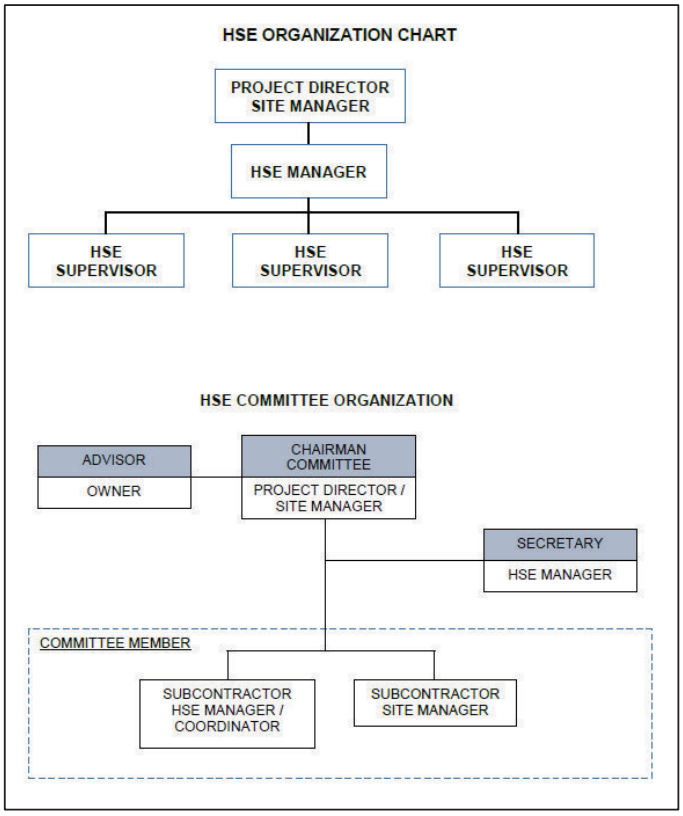


Figure 3.7 : CPM Environment, Health and Safety Organisation for construction phase

3.5.2 Operation and Maintenance (O&M) Phase

MRPR will be operate the power plant and will be responsible for recordkeeping and reporting, maintenance inspections, execution of routine maintenance, periodical maintenance and major overhaul in accordance with the Project ESMS, and emergency stop of operation and incident reporting. MRPR will prepare separate operation management plans and procedures that align with the Project ESMS. MRPR will also develop an overall organisational structure for environmental responsibilities on site and an organisational structure for operational health, safety, environmental and social management.

Table 3.2 provides an example of roles and responsibilities for implementation of the ESMS. However, these will need to be confirmed prior to construction/operation of the Project.

Table 3.2: Example roles and responsibilities for implementation of ESMS

Role	Responsibilities

Project Manager	• Review and approve strategic Project HSE Policy and Objectives.
	• Approve the Project ESMS and procedures.
	• Define roles, responsibilities and provide resources for ensuring that environmental requirements are implemented and maintained in all areas of Project activities.
	• Ensure that Project Environmental and Social Management System is managed in a structured manner throughout the site organisation.
	• Ensure sufficient resources are available to support the implementation of the Project ESMS
	• Review suitability and effectiveness of the Project ESMS etc.
	• Monitor overall performance of the construction and commissioning works.
	• Liaison with EPC Contractors.
	• Liaison with MRPR staff; engineers, managers etc.
	• Overall responsibility to ensure the following:
	  ○ Compliance with Contract and MRPR Standards.
	  ○ Compliance with MRPR safety and environmental standards.
	  ○ Compliance with all relevant regulations.
	• Represent MRPR for all stakeholders.

MRPR HSE Site Manager	• Ensure that the environmental requirements are established, implemented and maintained across the Project site activities, specifically including:
	  • Identification and assessment of environmental aspects.
	  • Environmental objectives, targets and environmental management program.
	• Develop and maintain environmental documents (e.g. Project environmental procedures and control procedures) and records.
	• Monitor adherence to the Project environmental policy & objectives, alerting management of non-compliance, and providing advice on remedial actions, through environmental audits, reviews, inspections etc.
	• Monitor and verify closeout of actions arising from environmental audits.
	• Report periodically to the Project management on the performance of the Project environmental management system.
	• Review the EPC Contractor's safety plan and ensure that all equipment and systems with the EPC scope are included and that the correct sequence of safety plan implementation has been adopted
	• Review the EPC Contractor's Permit to Work procedure and ensure that it complies with the MRPR safety rules.
	• Establish, oversee and ensure the safe performance of all work by site personnel.
	• Develop and implement the emergency response procedures.
	• Monitor First Aid and Fire response facilities and procedures and ensure that all necessary supplies are provided.
	• Conduct routine safety meetings for site personnel and provide material for EPC contractors to promote MRPRs safety rules in their own safety meetings.
	• Monitor adherence to the Project safety policy & objectives, alerting management of non-compliance, and providing advice on remedial actions, through safety audits, reviews, inspections etc.
	• Monitor and verify closeout of actions arising from safety audits.
	• Records and report site safety performance statistics.

Healthy and Safety Officer	• Conduct daily and weekly health and safety inspections of site and routine (at least every three months) audits. • Report results of inspections/audits and documentation reviews to the MRPRHSE Site Manager. • Assist the EPC Contractor to define appropriate corrective actions to be implemented as a result of any identified non-compliances and providing project-wide advice to ensure consistent approach and outcomes are achieved. • Ensure on an on-going basis, that health and safety requirements are communicated via formal training programs to all personnel engaged in work on behalf of MRPR

Role	Responsibilities
Environmental Officer	• Conduct daily and weekly environmental inspections of site and routine (at least every three months) audits. • Report results of inspections and documentation reviews to the VTEC HSE Site Manager. • Assist the EPC Contractor to define appropriate corrective actions to be implemented as a result of any identified non-compliances and providing project-wide advice to ensure consistent approach and outcomes are achieved. • Ensure on an on-going basis, that environmental requirements are communicated via formal training programs to all personnel engaged in work on behalf of VTEC.
Community Liaison Officer	The Community Liaison Officer will act as MRPR's representative to the affected communities and external stakeholders. MRPR will establish a clear reporting structure among the Community Liaison, Project Manager, Site Manager, HSE Manager and other relevant senior staff to effectively respond to stakeholder concerns and to manage reputational risks for the Project.
EPC Project Manager/ Project Director	The Project Manager has overall responsibility for the construction of the Project and associated infrastructure. In particular, the Project Manager will: • Maintain an awareness of the applicable Indonesian legal requirements, potential HSE implications, and relevant operational controls among the construction workers. • Manage implementation of standard operational procedures for implementing the ESMS. • Communicate the latest work programme to the HSE Manager on a daily basis to effectively manage and monitor the potential HSE risks and impacts associated with the upcoming works. • Ensure the ESMS is communicated, implemented, and maintained by the Operations Contractor and any Subcontractors. This includes: a) Reviewing and approving training plans. b) Ensuring appropriate training is carried out for employees. c) Reviewing and approving the site's Emergency Preparedness and Response Plan. d) Reviewing and approving the monitoring programme and HSE mitigation measures onsite, and implementing corrective and/or preventive actions in accordance with the operational control procedures. e) Monitoring compliance with the ESMS Periodically evaluating the effectiveness of the ESMS. f) Delegating a clear line of responsibility for HSE protection to the EPC Contractor's and any subcontractors
EPC HSE Manager	The HSE Manager has an overarching responsibility for the management, monitoring, inspection, and reporting of HSE aspects during operation. The HSE Manager will have the knowledge, skills, and experience necessary to perform their work, including up-to-date knowledge of Indonesian legislation and the international requirements as listed in Legal Requirements Register. The HSE Manager will also possess the knowledge, skills, and experience to implement the specific measures and actions required under the ESMS.
All other employees	All personnel employed for the operation of the Project are responsible for carrying out their roles in accordance with the ESMS.

3.6 Legal and Other Requirements

An important component of identifying and evaluating relevant environmental and social risks and impacts is defining the legislative framework within which the Project will operate. This includes Government of Indonesia legislation and international requirements such as the ADB Safeguards, International Finance Corporation (IFC) Standards for Environmental and Social Sustainability, etc

MRPR will prepare and maintain a Legal Requirements Register which sets out the relevant Indonesian environmental and social legislation and international requirements. The Legal Requirements Register will as a minimum be reviewed every six months by MRPR and it will be amended to take into account new legislation and all changes to existing legislation and international requirements in the preceding six months. Any changes which required revision to the ESMS and its management procedures such as changes to emission limits etc will be made and communicated with HSE personnel, EPC Contractors and MRPR senior

management. Key requirements to establishing the Legal Requirements Register are described in this section and listed in the Legal Requirements Register (Appendix A).

3.6.1 ADB Safeguards

ADB is committed to ensuring the social and environmental sustainability of the projects it supports. This commitment is outlined in the ADB Safeguard Policy Statement (ADB, 2009) which cover the following: Environmental, Involuntary Resettlement and Indigenous Peoples Safeguards. The ADB Safeguards represent the "policy framework" that the project must operate within.

3.6.2 Equator Principles

The Equator Principles (EP) consist of ten principles which provide guidance to financial institutions developing projects in a manner that is socially responsible and reflects sound environmental management practices. The following key principle relates to the requirement for an ESMS to be developed:

Principle 4 (Environmental and Social Management System and Equator Principles Action Plan) states that:

'For all Category A and Category B Projects, the EPFI will require the client to develop or maintain an Environmental and Social Management System (ESMS).

Further, an Environmental and Social Management Plan (ESMP) will be prepared by the client to address issues raised in the Assessment process and incorporate actions required to comply with the applicable standards. Where the applicable standards are not met to the EPFI's satisfaction, the client and the EPFI will agree an Equator Principles Action Plan (AP). The Equator Principles AP is intended to outline gaps and commitments to meet EPFI requirements in line with the applicable standards."

3.6.3 Supporting Documents

The EPs are supported primarily by two additional sets of documents:

- The IFC's Performance Standards on Social and Environmental Sustainability (IFC, 2012), which consist of eight performance standards which establish the standards the project should meet over the life of investment by IFC.
- The World Bank Environmental, Health, and Safety (EHS) Guidelines, which are technical reference documents with general and industry-specific examples of Good International Industry Practice (GIIP).

These are summarised below and further information is provided in Appendix A.1.

IFC's Performance Standards

IFC's Performance Standards define sponsor's roles and responsibilities for managing their projects and the requirements for receiving and retaining IFC support. They are also relevant to other institutions applying the Equator Principles when making project financing decisions.

The Performance Standards represent the "policy framework" for the ESIA and sustainable social and environmental management for the Project, whereas the IFC EHS Guidelines provide guidance on general and industry best practice as well as recommended numerical limits for emissions to the atmosphere, noise, liquid and solid wastes, hazardous wastes, health and safety, and other aspects of development projects.

EHS Guidelines

The Environmental Health and Safety (EHS) Guidelines are technical reference documents with general and industry-specific examples of Good International Industry Practice. The EHS Guidelines contain the performance levels and measures that are normally acceptable to the International Finance Corporation (IFC) and are generally considered to be achievable in new facilities at reasonable costs by existing technology.

In general, when host country regulations differ from the levels and measures presented in the EHS Guidelines, projects are expected to achieve whichever is more stringent. If less stringent levels or measures are appropriate in view of specific project circumstances, a full and detailed justification for any proposed alternatives is needed as part of the site-specific environmental assessment. This justification should demonstrate that the choice for any alternate performance levels is protective of human health and the environment.

The most applicable EHS guidelines to this Project are:

- EHS General Environment, Health and Safety (EHS) Guidelines (April 2007);
- EHS Guidelines for Electric Power Transmission and Distribution (April 2007); and
- EHS Guidelines for Thermal Power Plants (December 2008).
- EHS Guidelines for Onshore Oil and Gas Development (2007)

3.6.4 Indonesian Legislation

The Indonesian legal system is a hierarchal system under which National Regulations (Acts, National Government Regulations) provide the governing regulation and are translated into a number of implementing regulations and technical standards at lower levels of government. The requirements and standards in each regulation must be kept consistent at different levels of government. Should there be conflicting standards the higher level regulation takes precedence.

The implementing instrument for Acts and National Government Regulation normally takes the form of Ministerial Decrees. These are more detailed and specific than the governing National Regulations. For environmental issues, the implementing regulations and Decrees are normally issued by the State Minister of Environment. Acts, National Government Regulations, Ministerial Decrees of State Environmental Minister and Decrees of the Head of Central Environmental Agency are applicable throughout Indonesia.

At provincial level, the Governor and provincial government can set up local government standards in the form of Governor Decrees and Provincial Local Government Regulations. These regulations apply only within the issuing provincial jurisdiction. In terms of environmental standards, Governor and/or the provincial local government may set stricter standards than those set at a National level. In such cases, the stricter standards are to be followed by project proponents.

The various levels of government of Indonesia, including the provincial and local government agencies, that have some jurisdiction or control over the power plant, transmission line and gas pipeline construction and operation activities include:

- National Level: Ministry of Environment and Forestry (MOEF);
- Province Level: The Province of Riau; and
- Regency and City Level: Power plant and transmission line - Environmental Agency of Pekanbaru City (DLH – Kota Pekanbaru) and gas pipeline the Siak Regency and Pekanbaru City.

Relevant regulations to the project are summarised in Table 2.2. within Volume 1 of the ESIA.

3.7 Identification of Risks and Impacts

3.7.1 Introduction

This section details the procedures and actions to be undertaken as a result of the identification of risks and impacts occurring during the development of the Project that were not formerly identified or foreseen during the ESIA process.

3.7.2 Assessment of Risks

The ESIA and ESMP was finalised in April 2018 and identified and assessed the predicted risks and impacts of the Project in relation to a variety of environmental and social aspects. Impacts were identified based on the 'current' understanding of the Project and using baseline information from readily available data sources and data gathered on site. Due to a number of factors including change of environmental baseline status and limitations of the baseline studies, other impacts and risks not identified in the ESIA and ESMP process may arise during the construction and operation of the Project.

To appropriately manage the Project, an understanding of the potential risks and impacts that may affect the environmental, social, health and safety aspects is required. The potential impacts and associated mitigation measures and management procedures presented in this Framework ESMS are based on the baseline information and assessments provided in:

- Environmental and Social Management Plan (ESMP) prepared for the Project by Jacobs (April, 2018); and
- Environmental and Social Impact Assessment (ESIA) and associated Technical Reports, prepared for the Project by Jacobs (April, 2018)

During construction and operation of the Project there will be ongoing monitoring of environmental, social and health and safety aspects, reviews of compliance with the ESMS and an evaluation of the effectiveness of the ESMS. These monitoring events and reviews provide opportunities to review the environmental and social aspects of the project, determine whether the appropriate controls are working or need to be improved. In addition, they will help to identify any new aspects. This process is summarised in Figure 3.8.

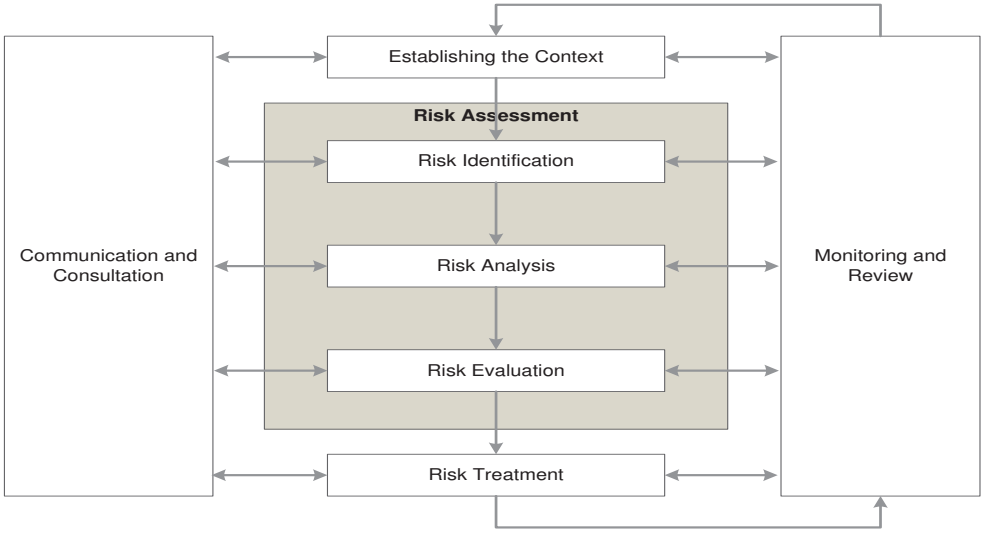


Figure 3.8 : Risk Assessment Process

3.7.3 Risks/Aspects Register

MRPR will develop a Risks/Aspect Register. This is a live document which will be reviewed as part of the ESMS review process or if there is a change to the design or operating procedure, which means a new aspect is added to the program or an existing aspects rating is modified.

All relevant Project environmental and social aspects will be captured in the Risks/Aspect Registers (examples provided in Appendix B). Any new aspects that are identified can then be assessed and rated in accordance with the risk rating systems described in Appendix B, and added to the Aspect Registers.

Designs, construction and operation shall be included in the hazard identification and risk assessment. Changes made to the original design, construction, fabrication or operation shall be addressed by applying management of change and communicating it to relevant employees. Site Instructions shall use the risk register as the reference to ensure there is adequate environmental and safety risk control in conducting a process or a task.

Environmental Aspect Identification and Impact Assessment

In order to apply best practices in environmental management, MRPR shall identify environmental aspects and impacts within its business process. MRPR shall follow criteria set out ISO14001 to determine significant environmental aspects and impacts. Based on significant aspects and impacts, MRPR shall develop its management plan. The control of significant aspects shall be based on hierarchy of control: elimination, substitution, engineering control and administrative control. Reduce, Reuse and Recycle (3R) shall be considered during selection of controls.

MRPR shall document and keep the environmental aspects and impacts up to date and communicate its significant environmental aspects and impacts among the various levels and functions.

OHS Management Hazard Identification and Risk Assessment

MRPR's OHS management shall be based on risks assessment and management. MRPR shall conduct hazard identification and risk assessment to produce an OHS Risk Register that will feed into the overall ESMS Aspects Register. This register shall be reviewed once a year at the minimum for maintaining adequacy and up-to-date suitability. The methodology for hazard identification and risk assessment shall:

- Provide for the identification, assessment and documentation of risks and its control.
- Apply the hierarchy of risk control: elimination, substitution, engineering control, administrative control and personal protective equipment (PPE).
- Changes in process shall be identified and risk register shall be updated accordingly.

3.8 Management Programmes

3.8.1 Environmental and Social Management Plan

The Environmental and Social Management Plan (ESMP) as outlined in Section 2 of this report, describes and prioritises the actions needed to implement mitigation measures, corrective actions and monitoring measures necessary to manage the impacts and risks identified in this ESIA relevant to the Project. These measures as outlined in the ESMP will be implemented via the ESMS.

In addition, a separate health and safety management plan will be prepared to ensure the wellness of the work force and surrounding community. Reference should be made to the Technical Report - Working Conditions, Occupational Safety and Health which is provided in Volume 5: Technical Appendices.

3.8.2 Procedures

The ESMS will provide a structure and procedures as to how the mitigation and monitoring measures as set out in the ESMP will be implemented. Procedures may include existing documents developed by the MRPR, or be developed by external parties. Procedures should, as a minimum, be developed on the following:

- Waste Management
- Hazardous Substances Management
- Soil and Erosion Management
- Excavation Works
- Entry into Confined Spaces
- Hazard Identification and Risk Assessment
- Air Quality Management and Monitoring
- Chance Find
- Emergency Preparedness and Response
- Noise and Vibration Management and Monitoring
- Traffic Management
- Stormwater Management and Monitoring
- General Human Resources
- Recruitment
- Training
- Work Permit
- Workers Grievance Mechanism
- Community Grievance Mechanism
- Stakeholder Engagement
- Occupational Safety and Health Management
- First Aid
- GHG Calculation and Reporting
- Social Monitoring and Reporting
- Review and Auditing of the ESMS
- Incident Investigation and Reporting
- Surface Water Quality and Monitoring
- Aspects Register Identification and Assessment
- Site Security

General Structure of Procedures

The following general structure should be applied to all ESMS Procedures:

1) **Project Sponsor Statement:** Outlines the commitment of the Project Sponsors to good environmental and social practices. May make reference to existing statements, policies or procedures.
2) **Project Context:** Outlines the overall context of the project and the purpose of the procedure.

3) **Purpose of Procedure:** Outlines the purpose of the procedure and which other related documents should be read alongside it.

4) **Scope of Procedure:** Outlines the mitigation measures proposed by the procedure and what specific tasks the management, mitigation and or monitoring covers.

5) **Procedure Details:** Provides detailed guidance including the following:

   a) Roles and responsibilities in relation to activities for both the Project Sponsors and any subcontractors;

   b) Definition of keys terms;

   c) Schedule of works;

   d) Sets out the steps and actions that need to be undertaken to implement the management, mitigation and/or monitoring measures;

   e) Sets out the standards the mitigation or monitoring is required to comply with;

   f) Verification and monitoring;

   g) Reporting of non-conformities;

   h) Details of training in relation to the procedure;

   i) Any forms that will accompany the procedure; and

   j) Auditing of procedure.

3.8.3 Contractor Management

A Contractor Management Procedure is required that establishes the necessary environmental, social and health and safety criteria for EPC Contractor's, Subcontractors and contracted services. This is very important given that the construction will be contracted to an external party and the operation and maintenance of the Project will be partly contracted to external service providers. Recommended procedural information for reporting includes:

- Contractor HSE Pre-Qualification;
- Contractor Safety, Health, Environment, and Community Management;
- Contractor HSE Performance Monitoring including site inspections, s audits etc;
- Incident/ Accident Reporting;
- HSE Reporting
- Contractor Register; and
- Contract Close-out.

These should be supported by a register of contractors, which includes information on pre-qualification requirements and contractor approvals.

3.9 Monitoring, Auditing and Review

3.9.1 Overview and Objectives

This section details a programme for the routine monitoring and evaluation of environmental, social and health and safety performance throughout the Project's lifecycle to ensure compliance with and conformance to good international industry practice. Monitoring and review are required not only to meet the commitments detailed in the AMDAL, ESIA and the various management plans, but also to monitor and respond to any unanticipated

environmental, social and health issues and impacts which arise during construction and/or operation. The programme aims to:

- routinely monitor, audit and review compliance with the ESMS;
- ensure adequate and appropriate interventions to address any occurrences of non-compliance;
- provide a mechanism for the follow-up and resolution of complaints by members of the public and/or contractors and/or workers on site;
- ensure appropriate and adequate record keeping related to compliance;
- determine the effectiveness of the specifications and recommend necessary changes and updates based on audit outcomes, in order to enhance the effectiveness of environmental and social management on site; and
- aid communication and feedback to authorities and stakeholders.

3.9.2 Monitoring of Environmental, Social and Health and Safety Aspects

Monitoring will be carried out in order to determine whether environmental, social and health and safety outcomes are being achieved. Monitoring requirements will be specified in a monitoring plan (or plans), which identify:

- the type of monitoring that is to be carried out;
- where monitoring is to take place;
- how frequently monitoring will be carried out;
- the parameters that will be tested for;
- the applicable objectives and performance standards; and
- who will conduct the monitoring.

3.9.3 ESMS Monitoring Programme

Reviews of the ESMS will be conducted throughout construction and operation of the Project and where necessary changes should be made to the documentation to ensure that it remains relevant. For instance, once construction has been completed, the construction related environmental and social aspects will no longer be relevant. An effective monitoring programme in terms of this ESMS will be achieved through:

- six monthly inspections and monitoring of all site activities by MRPR;
- maintenance of a monitoring schedule of all site activities in accordance with the suite of management plans as defined in the ESIA;
- routine review of all environmental, social and health and safety documents produced;
- compilation of progress reports that track progress and indicate the effectiveness of the ESMS in addressing and implementing environmental and social requirements; and
- monitoring of the implementation of any preventative action identified as a result of any incident, complaint or non-conformance to ensure the effectiveness of any changed procedures.

The monitoring programme will be supported by:

- the process for lodging grievances or complaints (i.e. MRPR's Worker's or Community Grievance Mechanism); and
- the process for corrective action (i.e. Worker's or Community Grievance Mechanism) to be followed if a complaint is made, an incident occurs or a non-conformance is identified;

- internal and external audits to be conducted to evaluate compliance with relevant environmental legislation and the ESMS.

The results of all monitoring undertaken in terms of this ESMS (including audits) will be analysed by MRPR to facilitate improvements in work practices or site activities in order to progressively improve environmental and social performance in terms of the ESMS.

3.9.4 Contractor Monitoring and Auditing

MRPR will be responsible for monitoring and auditing the EPC Contractors and Subcontractor to ensure that their environmental, social and health and safety performance is compliant with the following:

- MRPR Management Plans and Procedures;
- ESMP;
- RKL/RPL Documentation;
- Indonesian Regulations;
- ADB Safeguards;
- IFC Performance Standards; and
- WBG EHS Guidelines.

3.9.5 Corrective Action

Any breaches and/or non-compliance of the ESMS should be reported to the responsible department manager, with details of the incident/observation clearly documented. A copy of each incident/observation record should be held on file by MRPR's HSE Manager, to be supported by the reply copy when it is received. Depending on the nature of the non-compliance (minor or major incident), the Construction Manager and Owner's Engineer would be notified as required. Upon generation of such record, a timeline should be established by MRPR's HSE Manager, along with the manager/supervisor responsible for the area for:

- Planning and submission of a corrective action plan;
- Planned implementation and inspection/verification of the corrective action;
- Final close-out the corrective action plan;

The responsible manager/supervisor is to implement the corrective action by the targeted dates. A record of the corrective actions would be made and tracked to their completion.

All non-compliances must then be investigated and a report identifying reasons for occurrence, measures required to prevent future incidents and any other recommendations including development of new procedures (if required), are to be produced within a reasonable timeframe of the incident occurring.

3.9.6 ESMS Auditing

Routine auditing will be carried out to determine the level of compliance with the ESMS and evaluate the effectiveness of the ESMS. A procedure will be developed along with an auditing programme to define:

- timing;
- scope;
- audit criteria;
- reporting of audit findings; and
- process for implementing corrective actions.

An audit checklist should be produced to maintain consistency if different auditors are utilised.

Internal Audits

In addition to regular monitoring, periodic internal system audits (i.e. semi-annual) will be conducted to ensure that the ESMS is properly implemented and maintained, that work is being performed in accordance with planned arrangements and that the management plans and controls are effective. Audits are classified into internal and external audits.

An audit schedule will be developed by MRPR. The schedule will be reviewed annually and amended, as necessary, to ensure that it provides for the effective review of the ESMS.

The internal audits will be undertaken by MRPR semi-annually and will ensure that audit findings (including both non-compliance and also positive audit results) are documented in an Audit Report.

The audit report would be structured to check the progress and compliance of the various ESMS components (i.e. having content similar to this ESMS report, with individual components being audited). A summary of the key findings from the ESMS Audit Report will also be included in the Semi-Annual Report to the Lenders.

External Audits

An independent body (a third party auditor) is likely to undertake an audit of the overall Project activities and may include, but is not limited to, the following organisations:

- International finance institutions or their representative/consultants (i.e. Lender's Technical Advisor);
- an ESMS auditor / certifying body; and
- any other external audits committed to in the various management plans.

3.9.7 Incident and Non Compliance Investigation and Reporting

Incident investigation shall be carried out for all environmental incidents (including near misses that could lead to major incident). Root causes of incident shall be identified and corrective actions implemented to prevent recurrence. The investigation team is formed based on the magnitude and severity of the incident. For major incidents, Corporate function representatives will be part of the investigation team. Team members shall have adequate competency to conduct investigation. Environmental incidents and non-compliances must be reported to the MRPR site manager. Major ones are also to be reported to MRPR's corporate functions and if there are notifiable event of environmental incident, MRPR shall report to local environmental agency.

3.10 Stakeholder Engagement

The purpose of stakeholder engagement is primarily for transparency to the community, to inform them of the Project and associated construction activities, and the impacts it has on them and the environment. This provides an avenue for stakeholders to understand the Project impacts, how the impacts are being managed. A key aim of the stakeholder engagement is to provide stakeholder the opportunity for comment. Their comments/views will be considered by MRPR.

A Stakeholder Engagement Plan (SEP) has been prepared for the Project: see ESIA Volume 3: Social Impact Assessment. This addresses the requirements described in the following sections.

3.10.1 Stakeholder analysis and planning

In order to conduct effective engagement some analysis is required of the type of stakeholders and the best means of communication with them with regards to the project and its potential impacts. To do this an initial list

of potential stakeholders and key interest groups affected by the Project has been prepared in the SEP. This involved consideration of persons or groups:

- who are directly and/or indirectly affected by the Project, due to environmental, social or economic changes;
- have interest in the Project and Project outcomes; and
- have potential to influence the Project and Project outcomes.

Further stakeholder identification must be comprehensive and include identification and verification of key stakeholder representatives (especially community leaders, elected public representatives and traditional representatives) and vulnerable stakeholder groups (including women). Stakeholder identification activities will build on the stakeholder consultation activities already conducted by the Project Sponsor through the AMDAL process.

The initial list of identified stakeholders has been assessed to the stakeholder's level of interest in the Project and influence according to the following categories, shown in Figure 3.7. Refer to Appendix D for the initial analysis of the stakeholder groups identified.

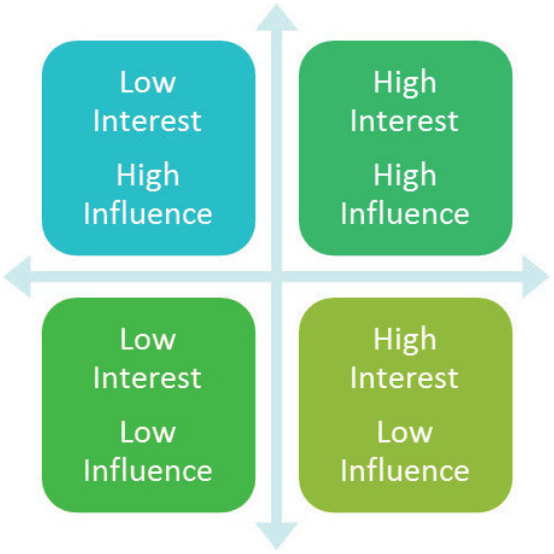


Figure 3.9 : Stakeholder Interest and Influence

Levels of engagement will range from closer management for high interest/high influence stakeholders to monitoring for lower interest/low influence parties. It is important to keep in mind that the interest or influence of a stakeholder is fluid and may change as the Project progresses. Therefore, it is important the MRPR continuously reassess and identify new stakeholders and the level of stakeholder engagement at different stages of the Project as outlined in the SEP. As a result, the SEP will need to be updated on a regular basis.

3.10.2 Disclosure and dissemination of information

Disclosure of relevant project information helps potentially affected communities understand the potential risks, impacts and opportunities of the project. MRPR should provide such people with access to relevant information on:

- the purpose, nature, and scale of the project;
- the duration of proposed project activities;
- any risks to and potential impacts on such communities and relevant mitigation measures;

- the envisaged stakeholder engagement process; and
- the grievance mechanism.

In addition, MRPR will need to prepare and maintain a procedure for external communications that includes methods to:

- receive and register external communications from the public;
- screen and assess the issues raised and determine how to address them;
- provide, track, and document responses, if any; and
- adjust the management program, as appropriate.

MRPR are also encouraged to make publicly available periodic reports on their environmental and social sustainability.

3.10.3 Consultation and participation

Consultation with potentially affected communities and individual stakeholders will ensure they have an opportunity to provide input on the Project, its potential impacts, possible alternatives and the proposed mitigation and monitoring measures. The extent and nature of engagement activities depends upon the nature of degree of impacts.

The SEP prepared for the Project outlines key timing, participants and methods of consultation across the lifetime of the project. During construction and operation MRPR will be responsible for consultation to keep stakeholders informed of the ongoing changes in Project activities, manage issues and grievances as they arise and monitor the effectiveness of mitigation and compensation.

3.10.4 Grievance mechanism

A grievance mechanism has been established in the SEP to enable potentially affected communities to air their concerns and grievances about the MRPR's environmental and social performance. The grievance mechanism will be scaled to the risks and adverse impacts of the Project; will seek to resolve concerns promptly, using an understandable and transparent consultative process that is readily accessible, and at no cost to such affected communities. The mechanism will also ensure there is no retribution to the party that originated the issue or concern.

3.10.5 Reporting to affected communities

MRPR should provide periodic reports to the potentially affected communities describing progress in implementation of project actions that involve or may impact on them as well as addressing issues that the communities have raised.

3.11 Training

MRPR shall identify the knowledge and skills necessary for implementation of the ESMS and identify training requirements for its personnel and contractors engaged during the construction and operation of the Project.

All persons responsible for undertaking work during the life of the project must be trained on the contents of the ESMS. Training shall include, but is not limited to:

- definition of the environment;
- need for environmental protection and conservation;
- impacts of construction activities on the environment;

- adequate mitigation measures against such impacts;
- emergency preparedness and response plan;
- social responsibility during construction e.g. being considerate to local residents;
- Project ESMS policy and objectives;
- the Project ESMP;
- Health and Safety Management System; and
- current applicable laws and regulations.

A Training Procedure will be developed that includes:

- inductions (identifying different types that may be required);
- training needs identification;
- training schedule;
- assessment of competency;
- recognition of prior learning;
- evaluation of training; and
- records.

All training information, records and certificates should be properly documented and filed. An audit of the ESMS is likely to seek verification that all project personnel have been given the appropriate training. This will require a comprehensive training/induction register.

3.12 Administration

3.12.1 Human resources

MRPR shall develop human resources (HR) policies and procedures which are documented in a HR manual and give guidance consistent with the requirements of IFC Performance Standard 2 and Government of Indonesia labour laws. The HR policy and manual will provide standard compliance with local labour laws, a description of functions/positions and requirements, general benefits, and give guidance on employee's selection, hiring and promoting procedures.

All employees will receive a copy of this manual at their first day at work. The HR manual will include:

- prohibition of any type of child and/or forced labour;
- the implementation of equal opportunity and non-discriminatory hiring and promotion policies;
- description and full disclosure of the workers/employees' rights and duties, including freedom of association and collective bargaining; and
- a non-retaliatory grievance mechanism to receive and process any complaints from employees on work related conflicts or issues.

Compliance with these policies and procedures will also be mandatory to all contractors, suppliers, and sub-contractors.

3.12.2 Document control

Document control will be carried out in accordance with a Document Control Procedure, which will address the following:

- controlled documents;
- controlled document preparation;
- document reference notation (document numbering);
- review of documents;
- approval of documents; and
- document recording and removal.

A document register will be prepared to capture all relevant ESMS documents, spreadsheets, registers and maps.

Controlled Documents

A 'controlled document' is a standard document produced by MRPR in which the format, content and distribution are controlled. A 'controlled format document' in which the format is controlled but not the content once the document has been completed. This refers to pre-printed forms including incident reporting, training records and audit checklists. Upon completion of this type of document, a copy is retained (filed) as a record.

Document Approval and Issue

The issue of controlled documents will be under cover note (memorandum) to all persons identified in the distribution list. A Master Register which records the latest revision number of the issues is retained for all such distributions.

The cover note identifies the reason for the issue and which documents are superseded and to be subsequently removed. Each holder of a controlled document is responsible for updating issues upon receipt of the memorandum and removing obsolete copies.

Document Changes/Modifications

All documents are to be reviewed and approved by the Project Manager. The authorisation of changes will be denoted by a memorandum which will be added at the front of each controlled document. The cover note identifies changes to controlled documents.

In each document making up the ESMS, there is a revision log which shall be used to record the date and revision number of each section which is issued as a revision. It is the responsibility of the manual owner to update the revision log on receipt of new or revised sections. They are also responsibility for notifying affected parties that a new version is in use.

An electronic version of the ESMS should be made available to MRPR Personnel. This version shall be maintained in a 'read only' mode. Changes to this electronic copy may only be made under the delegated authority from the Project Manager. In all cases, changes to the electronic version should mirror only those changes issued to the controlled documents through memorandums or cover notes. The electronic version will act at the most up-to-date version of the ESMS. All hard copies of the ESMS are considered 'uncontrolled' copies.

3.12.3 ESMS review and auditing

As described in Section 3.9, there will be periodic reviews and audits of the ESMS. Any changes to ESMS documentation that result from these shall be made in accordance with the Document Control Procedure outlined above.

3.12.4 Reporting

MRPR shall report to the relevant financial institutions and government authorities on the implementation of the AMDAL and the ESMP as required.

Progress reporting by the EPC contractor's to MRPR will also be carried out as required. For example, reporting should be in accordance with the Environmental Permit issued once the AMDAL has been approved. Reporting to financial institutions should be in accordance with the CTA (following financial close).

Appendix A. Legal Requirements Register

A.1 ADB Safeguards

Policy Principles:

1. Use a screening process for each proposed project, as early as possible, to determine the appropriate extent and type of environmental assessment so that appropriate studies are undertaken commensurate with the significance of potential impacts and risks.
2. Conduct an environmental assessment for each proposed project to identify potential direct, indirect, cumulative, and induced impacts and risks to physical, biological, socioeconomic (including impacts on livelihood through environmental media, health and safety, vulnerable groups, and gender issues), and physical cultural resources in the context of the project's area of influence. Assess potential transboundary and global impacts, including climate change. Use strategic environmental assessment where appropriate.
3. Examine alternatives to the project's location, design, technology, and components and their potential environmental and social impacts and document the rationale for selecting the particular alternative proposed. Also consider the no project alternative.
4. Avoid, and where avoidance is not possible, minimize, mitigate, and/or offset adverse impacts and enhance positive impacts by means of environmental planning and management. Prepare an environmental management plan (EMP) that includes the proposed mitigation measures, environmental monitoring and reporting requirements, related institutional or organizational arrangements, capacity development and training measures, implementation schedule, cost estimates, and performance indicators. Key considerations for EMP preparation include mitigation of potential adverse impacts to the level of no significant harm to third parties, and the polluter pays principle.
5. Carry out meaningful consultation with affected people and facilitate their informed participation. Ensure women's participation in consultation. Involve stakeholders, including affected people and concerned nongovernment organizations, early in the project preparation process and ensure that their views and concerns are made known to and understood by decision makers and taken into account. Continue consultations with stakeholders throughout project implementation as necessary to address issues related to environmental assessment. Establish a grievance redress mechanism to receive and facilitate resolution of the affected people's concerns and grievances regarding the project's environmental performance.
6. Disclose a draft environmental assessment (including the EMP) in a timely manner, before project appraisal, in an accessible place and in a form and language(s) understandable to affected people and other stakeholders. Disclose the final environmental assessment, and its updates if any, to affected people and other stakeholders.
7. Implement the EMP and monitor its effectiveness. Document monitoring results, including the development and implementation of corrective actions, and disclose monitoring reports.
8. Do not implement project activities in areas of critical habitats, unless (i) there are no measurable adverse impacts on the critical habitat that could impair its ability to function, (ii) there is no reduction in the population of any recognized endangered or critically endangered species, and (iii) any lesser impacts are mitigated. If a project is located within a legally protected area, implement additional programs to promote and enhance the conservation aims of the protected area. In an area of natural habitats, there must be no significant conversion or degradation, unless (i) alternatives are not available, (ii) the overall benefits from the project substantially outweigh the environmental costs, and (iii) any conversion or degradation is appropriately mitigated. Use a precautionary approach to the use, development, and management of renewable natural resources.
9. Apply pollution prevention and control technologies and practices consistent with international good practices as reflected in internationally recognized standards such as the World Bank Group's Environmental, Health and Safety Guidelines. Adopt cleaner production processes and good energy efficiency practices. Avoid pollution, or, when avoidance is not possible, minimize or control the intensity or load of pollutant emissions and discharges, including direct and indirect greenhouse gases emissions, waste generation, and release of hazardous materials from their production, transportation, handling, and storage. Avoid the use of hazardous materials subject to international bans or phaseouts. Purchase, use, and manage pesticides based on integrated pest management approaches and reduce reliance on synthetic chemical pesticides.
10. Provide workers with safe and healthy working conditions and prevent accidents, injuries, and disease. Establish preventive and emergency preparedness and response measures to avoid, and where avoidance is not possible, to minimize, adverse impacts and risks to the health and safety of local communities.
11. Conserve physical cultural resources and avoid destroying or damaging them by using field-based surveys that employ qualified and experienced experts during environmental assessment. Provide for the use of "chance find" procedures that include a pre-approved management and conservation approach for materials that may be discovered during project implementation.

Figure A.1: ADB Environmental Safeguards Policy Principles (ADB, 2009)

Policy Principles:

1. Screen the project early on to identify past, present, and future involuntary resettlement impacts and risks. Determine the scope of resettlement planning through a survey and/or census of displaced persons, including a gender analysis, specifically related to resettlement impacts and risks.
2. Carry out meaningful consultations with affected persons, host communities, and concerned nongovernment organizations. Inform all displaced persons of their entitlements and resettlement options. Ensure their participation in planning, implementation, and monitoring and evaluation of resettlement programs. Pay particular attention to the needs of vulnerable groups, especially those below the poverty line, the landless, the elderly, women and children, and Indigenous Peoples, and those without legal title to land, and ensure their participation in consultations. Establish a grievance redress mechanism to receive and facilitate resolution of the affected persons' concerns. Support the social and cultural institutions of displaced persons and their host population. Where involuntary resettlement impacts and risks are highly complex and sensitive, compensation and resettlement decisions should be preceded by a social preparation phase.
3. Improve, or at least restore, the livelihoods of all displaced persons through (i) land-based resettlement strategies when affected livelihoods are land based where possible or cash compensation at replacement value for land when the loss of land does not undermine livelihoods, (ii) prompt replacement of assets with access to assets of equal or higher value, (iii) prompt compensation at full replacement cost for assets that cannot be restored, and (iv) additional revenues and services through benefit sharing schemes where possible.
4. Provide physically and economically displaced persons with needed assistance, including the following: (i) if there is relocation, secured tenure to relocation land, better housing at resettlement sites with comparable access to employment and production opportunities, integration of resettled persons economically and socially into their host communities, and extension of project benefits to host communities; (ii) transitional support and development assistance, such as land development, credit facilities, training, or employment opportunities; and (iii) civic infrastructure and community services, as required.
5. Improve the standards of living of the displaced poor and other vulnerable groups, including women, to at least national minimum standards. In rural areas provide them with legal and affordable access to land and resources, and in urban areas provide them with appropriate income sources and legal and affordable access to adequate housing.
6. Develop procedures in a transparent, consistent, and equitable manner if land acquisition is through negotiated settlement to ensure that those people who enter into negotiated settlements will maintain the same or better income and livelihood status.
7. Ensure that displaced persons without titles to land or any recognizable legal rights to land are eligible for resettlement assistance and compensation for loss of nonland assets.
8. Prepare a resettlement plan elaborating on displaced persons' entitlements, the income and livelihood restoration strategy, institutional arrangements, monitoring and reporting framework, budget, and time-bound implementation schedule.
9. Disclose a draft resettlement plan, including documentation of the consultation process in a timely manner, before project appraisal, in an accessible place and a form and language(s) understandable to affected persons and other stakeholders. Disclose the final resettlement plan and its updates to affected persons and other stakeholders.
10. Conceive and execute involuntary resettlement as part of a development project or program. Include the full costs of resettlement in the presentation of project's costs and benefits. For a project with significant involuntary resettlement impacts, consider implementing the involuntary resettlement component of the project as a stand-alone operation.
11. Pay compensation and provide other resettlement entitlements before physical or economic displacement. Implement the resettlement plan under close supervision throughout project implementation.
12. Monitor and assess resettlement outcomes, their impacts on the standards of living of displaced persons, and whether the objectives of the resettlement plan have been achieved by taking into account the baseline conditions and the results of resettlement monitoring. Disclose monitoring reports.

Figure A.2: ADB Involuntary Resettlement Safeguards Policy Principles (ADB, 2009)

Figure A.3: ADB Indigenous Peoples Safeguards Policy Principles (ADB, 2009)

Policy Principles:

1. Screen early on to determine (i) whether Indigenous Peoples are present in, or have collective attachment to, the project area; and (ii) whether project impacts on Indigenous Peoples are likely.
2. Undertake a culturally appropriate and gender-sensitive social impact assessment or use similar methods to assess potential project impacts, both positive and adverse, on Indigenous Peoples. Give full consideration to options the affected Indigenous Peoples prefer in relation to the provision of project benefits and the design of mitigation measures. Identify social and economic benefits for affected Indigenous Peoples that are culturally appropriate and gender and intergenerationally inclusive and develop measures to avoid, minimize, and/or mitigate adverse impacts on Indigenous Peoples.
3. Undertake meaningful consultations with affected Indigenous Peoples communities and concerned Indigenous Peoples organizations to solicit their participation (i) in designing, implementing, and monitoring measures to avoid adverse impacts or, when avoidance is not possible, to minimize, mitigate, or compensate for such effects; and (ii) in tailoring project benefits for affected Indigenous Peoples communities in a culturally appropriate manner. To enhance Indigenous Peoples' active participation, projects affecting them will provide for culturally appropriate and gender inclusive capacity development. Establish a culturally appropriate and gender inclusive grievance mechanism to receive and facilitate resolution of the Indigenous Peoples' concerns.
4. Ascertain the consent of affected Indigenous Peoples communities to the following project activities: (i) commercial development of the cultural resources and knowledge of Indigenous Peoples; (ii) physical displacement from traditional or customary lands; and (iii) commercial development of natural resources within customary lands under use that would impact the livelihoods or the cultural, ceremonial, or spiritual uses that define the identity and community of Indigenous Peoples. For the purposes of policy application, the consent of affected Indigenous Peoples communities refers to a collective expression by the affected Indigenous Peoples communities, through individuals and/or their recognized representatives, of broad community support for such project activities. Broad community support may exist even if some individuals or groups object to the project activities.
5. Avoid, to the maximum extent possible, any restricted access to and physical displacement from protected areas and natural resources. Where avoidance is not possible, ensure that the affected Indigenous Peoples communities participate in the design, implementation, and monitoring and evaluation of management arrangements for such areas and natural resources and that their benefits are equitably shared.
6. Prepare an Indigenous Peoples plan (IPP) that is based on the social impact assessment with the assistance of qualified and experienced experts and that draw on indigenous knowledge and participation by the affected Indigenous Peoples communities. The IPP includes a framework for continued consultation with the affected Indigenous Peoples communities during project implementation; specifies measures to ensure that Indigenous Peoples receive culturally appropriate benefits; identifies measures to avoid, minimize, mitigate, or compensate for any adverse project impacts; and includes culturally appropriate grievance procedures, monitoring and evaluation arrangements, and a budget and time-bound actions for implementing the planned measures.
7. Disclose a draft IPP, including documentation of the consultation process and the results of the social impact assessment in a timely manner, before project appraisal, in an accessible place and in a form and language(s) understandable to affected Indigenous Peoples communities and other stakeholders. The final IPP and its updates will also be disclosed to the affected Indigenous Peoples communities and other stakeholders.
8. Prepare an action plan for legal recognition of customary rights to lands and territories or ancestral domains when the project involves (i) activities that are contingent on establishing legally recognized rights to lands and territories that Indigenous Peoples have traditionally owned or customarily used or occupied, or (ii) involuntary acquisition of such lands.
9. Monitor implementation of the IPP using qualified and experienced experts; adopt a participatory monitoring approach, wherever possible; and assess whether the IPP's objective and desired outcome have been achieved, taking into account the baseline conditions and the results of IPP monitoring. Disclose monitoring reports.

A.2 Equator Principles

The Equator Principles comprise of ten principles that provide guidance to financial institutions developing projects in a manner that is socially responsible and reflects sound environmental management practices. These are:

Principle 1: Review and Categorisation.

When a project is proposed for financing it will be categorised based on the magnitude of its environmental and social risks and impacts. This screening is based on the environmental and social categorisation process of the International Finance Corporation (IFC). The categories are as follows:

- Category A – projects with potentially significant adverse environmental and social risks and/or impacts that are diverse, irreversible or unprecedented.
- Category B - projects with potential limited adverse environmental and social risks and/or impacts that are few in number, generally site-specific, largely reversible and readily addressed through mitigation measures; and
- Category C - projects with minimal or no adverse environmental and social risks and/or impacts

Principle 2: Environmental and Social Assessment

For all Category A and B projects an assessment process is required to address the relevant environmental and social risks and/or impacts of the proposed project. This should propose measures to minimise, mitigate and offset adverse impacts in a manner that is relevant and appropriate to the nature and scale of the Project.

Principle 3: Applicable Environmental and Social Standards

In the first instance, projects should address compliance with the host country laws, regulations and permits that pertain to environmental and social issues where they are available.

Principle 4: Environmental and Social Management System and Equator Principles Action Plan

For Category A and B projects an Environmental and Social Management System (ESMS) shall be prepared and an Environment and Social Management Plan (ESMP) also prepared to address issues raised in the assessment process and incorporate actions required to comply with applicable standards. Where standards are unable to be met, an Equator Principles Actions Plan (AP) shall be prepared to outline gaps in achieving the standards.

Principle 5: Stakeholder Engagement

For all Category A and B projects effective stakeholder engagement must be undertaken on an ongoing basis. It must be structured and culturally appropriate and include affected communities and other stakeholders. The provision of information should be tailored to the risks and benefits of the programme, phase of development, language preferences of affected communities and free from external manipulation, interference, coercion and intimidation.

Principle 6: Grievance Mechanism

For Category A and as appropriate Category B projects a grievance mechanism must be designed in order to receive and facilitate resolution of concerns and grievances about the environmental and social performance.

Principle 7: Independent review

Project finance - for Category A and as appropriate Category B projects an independent review of the Assessment Documentation and Stakeholder Engagement process documentation will be undertaken to assess compliance with the Equator Principles.

Project related corporate loans – For projects with potential high risk of impacts (and if appropriate Category A and B projects) an independent review is required by an Environmental and Social Consultant.

Principle 8: Covenants

For all projects, the sponsor will covenant in the financing documentation to comply with all relevant host country environmental and social laws, regulations and permits in all material respects. For Category A and B projects the sponsor will covenant the financial documentation to comply with the ESMPs and Equator Principles Action Plan, to provide periodic reports to document compliance and to decommission the facilities, where appropriate in accordance with a decommissioning plan.

If there are non-compliances, remedial action will need to be taken.

Principle 9: Independent Monitoring and Review

All Category A and where appropriate Category B projects require the appointment of an independent Environmental and Social Consultant to assess project compliance and ensure ongoing monitoring for project finance. For project related corporate loans where review is required under principle 7 an independent review by an Environmental and Social Consultant is also required. The financial institutions will normally appoint a Lenders Technical Advisor to conduct due diligence. The LTA will perform an independent review of the ESIA, ESMS and ESMP as well as ongoing project compliance.

Principle 10: Reporting and Transparency

Sponsors reporting – also required in addition to principle 5 is ensuring that at a minimum, a summary of the ESIA is accessible and available online and GHG emission levels are publically reported, if applicable. Note that GHG emissions will be addressed in the ESIA and will only need to be publically reported if the project emits over 100,000 tonnes of CO_2 equivalent annually.

Equator Principle Financial Institutions (EPFI) – the EPFI will report publically at least monthly on transactions that have reached financial close and on its Equator Principles implementation process and experience.

Supporting Documents

The Equator Principles (2013) are supported primarily by two additional sets of documents:

- the IFC's Performance Standards on Social and Environmental Sustainability (IFC, 2012), which consist of eight performance standards which establish the standards the Project should meet over the life of investment by IFC
- the World Bank Environmental, Health, and Safety (EHS) Guidelines, which are technical reference documents with general and industry-specific examples of Good International Industry Practice. These guidelines include specific guidelines for Electric Power Transmission and Distribution.

IFC Performance standards objectives

Performance Standard	Objectives
Social and Environmental Assessment and Management Systems	• To identify and evaluate environmental and social risks and impacts of the project. • To adopt a mitigation hierarchy to anticipate and avoid, or where avoidance is not possible, minimise, and where residual impacts remain, compensate/ offset for risks and impacts to workers, Affected Communities, and the environment. • To promote improved environmental and social performance of sponsors through the effective use of management systems. • To ensure that grievances from Affected Communities and external communications from other stakeholders are responded to and managed appropriately. • To promote and provide means for adequate engagement with Affected Communities throughout the project cycle on issues that could potentially affect them and to ensure that relevant environmental and social information is disclosed and disseminated.
Labour and Working Conditions	• To promote the fair treatment, non-discrimination, and equal opportunity of workers. • To establish, maintain, and improve the worker-management relationship. • To promote compliance with national employment and labour laws. • To protect workers, including vulnerable categories of workers such as children, migrant workers, workers engaged by third parties, and workers in the sponsor's supply chain. • To promote safe and healthy working conditions, and the health of workers. • To avoid the use of forced labour.
Pollution Prevention and Abatement	• To avoid or minimise adverse impacts on human health and the environment by avoiding or minimising pollution from project activities. • To promote more sustainable use of resources, including energy and water. • To reduce project-related GHG emissions.
Community Health, Safety and Security	• To anticipate and avoid adverse impacts on the health and safety of the Affected Community during the project life from both routine and non-routine circumstances. • To ensure that the safeguarding of personnel and property is carried out in accordance with relevant human rights principles and in a manner that avoids or minimises risks to the Affected Communities.
Land Acquisition and Involuntary Resettlement	• To avoid, and when avoidance is not possible, minimise displacement by exploring alternative project designs. • To avoid forced eviction. • To anticipate and avoid, or where avoidance is not possible, minimise adverse social and economic impacts from land acquisition or restrictions on land use by (i) providing compensation for loss of assets at replacement cost and (ii) ensuring that resettlement activities are implemented with appropriate disclosure of information, consultation, and the informed participation of those affected.

	• To improve, or restore, the livelihoods and standards of living of displaced persons. • To improve living conditions among physically displaced persons through the provision of adequate housing with security of tenure at resettlement sites.
Biological Conservation and Sustainable Natural Resource Management	• To protect and conserve biodiversity. • To maintain the benefits from ecosystem services. • To promote the sustainable management of living natural resources through the adoption of practices that integrate conservation needs and development priorities.
Indigenous Peoples	• To ensure that the development process fosters full respect for the human rights, dignity, aspirations, culture, and natural resource-based livelihoods of Indigenous Peoples. • To anticipate and avoid adverse impacts of projects on communities of Indigenous Peoples, or when avoidance is not possible, to minimise and/or compensate for such impacts. • To promote sustainable development benefits and opportunities for Indigenous Peoples in a culturally appropriate manner. • To establish and maintain an ongoing relationship based on Informed Consultation and Participation (ICP) with the Indigenous Peoples affected by a project throughout the project's life-cycle. • To ensure the Free, Prior, and Informed Consent (FPIC) of the Affected Communities of Indigenous Peoples when the circumstances described in this Performance Standard are present • To respect and preserve the culture, knowledge, and practices of Indigenous Peoples.
Cultural Heritage	• To protect cultural heritage from the adverse impacts of project activities and support its preservation. • To promote the equitable sharing of benefits from the use of cultural heritage.

A.3 Government of Indonesia Legislative Requirements

Regulation	Summary
General Requirements	
Act No. 32 of 2009 regarding Environmental Protection and Management	Overarching environmental law for Indonesia.
Act No. 05 of 1990 regarding Natural Resources Conservation and its Ecosystems	Overarching on natural resources conservation with ecosystems on all over Indonesia
Act No. 30 of 2009 regarding Electricity	Overarching on Electricity for Indonesia
Environmental Impact Assessment	
Government Regulation No. 27 of 2012 regarding Environmental Permit	Defines requirement to prepare an AMDAL including timeframes. Key components include technical assessments, developing an ongoing monitoring programme and consultation.
Ministerial Environment Regulation No. 5 of 2012 regarding Types of Projects and/or Activities which require AMDAL	Defines activities that require an AMDAL including CCGT generation and electricity transmission.
Ministerial Environment Regulation No.16 of 2012 regarding guidelines for environmental documentation	Provides guidance of the preparation of environmental documents, including an AMDAL and UKL/UPL.
Ministerial Environment Regulation No.17 of 2012 regarding community participation in the AMDAL and environmental permit process	Outlines the public involvement requirements in the AMDAL and Environmental Permit process.
Ministerial Environment Decree No.45 of 2005 regarding implementation report of the AMDAL and UKL/UPL	Guidelines for preparing implementation report for AMDAL and UKL UPL
Ministerial Environment Regulation No. 2 of 2013 regarding sanctions for Environmental Management and Protection	Regulates sanctions for violations in environmental protection and management regulations
Ministerial Environment Regulation No. 8 of 2012 regarding Procedures of Assessment and Examination of Environmental Documents	Regulates how to assess and examine an AMDAL or UKL/UPL documents prior to Environmental Permit
Water and Wastewater	
Government Regulation No. 82 of 2001 regarding Water Quality Management and Water Pollution Control	Regulates the ambient river water quality standards. PT MRPR as the project proponent must apply for and obtain a discharge permit from the provincial local government for discharging wastewater to river during the power station operation. Once the power station operates, PT MRPR or the assigned operating company must provide three monthly compliance reports to the Pekanbaru Mayor (Walikota Pekanbaru).

Regulation	Summary
Ministry of Environment Regulation No. 8 of 2009 regarding wastewater quality standards for thermal power plants	Regulates the minimum effluent quality of thermal power plants.
Ministry of Environment Regulation No. 1 of 2010 regarding procedure for water pollution control	Provides guidance for central and local governments to implement water pollution control.
Ministry of Environment and Forestry Regulation No. 68 of 2016 regarding standards for domestic wastewater.	Provides the standards for domestic wastewater.
Ministry of Health Regulation No. 32 of 2017 regarding groundwater health and hygiene in relation to: pool, solus per aqua and public bath.	Provides the standards for using groundwater for daily activities.
Natural Protection and Free Zone	
Presidential Decree No. 32 of 1990 regarding Protected Area	Determines environmentally sensitive areas that must be protected and used only for green / natural areas.
Ministerial Regulation of the Minister of Public Works No. 63/PRT/1993 of 1993 regarding River Free Zone Lines, River Use Areas, River Control Areas and Dried Rivers	Determines river areas and uses allowed in such areas, including River Free Zones that can only be used for green / natural areas with no permanent buildings.
Ambient Air Quality and Air Emissions	
Government Regulation No. 41 of 1999 regarding Air Pollution Control	Regulates ambient air quality standards.
Ministerial Environment Regulation No. 21 of 2008 regarding Emission Standard of Stationary Sources	Regulates emission standards.
Noise	
Ministerial Decree of State Minister of Environment No. 48 of 1996 regarding Noise Level Standard	Regulates 55 dBA and 70 dBA as the noise thresholds for residential areas and at the site boundary of the power station respectively.
Hazardous Waste & Substances	
Government Regulation No. 101 of 2014 regarding classification and management of hazardous materials	Determines characteristics of substances that should be classified as hazardous and toxic goods. Under this regulation, hazardous substances are to be managed in a manner similar to managing hazardous wastes.
Ministerial Environment Regulation No. 18 of 2009 regarding permit procedure of hazardous waste management	Regulates the hazardous waste management licensing procedure.
Ministerial Environment Regulation No. 30 of 2009 regarding the supervision of hazardous waste management	Regulates the supervision of hazardous waste management. This excludes the management of used oils.
Solid waste	

Regulation	Summary
Act No. 18 of 2008 regarding the management of waste	Regulates waste management in Indonesia.
Land Acquisition	
Law No. 2 of 2012 regarding land acquisition for project development of public interest	Regulates land acquisition for public projects.
Presidential Regulation No. 71 of 2012 regarding land acquisition for project development of public interest.	Requires land acquisition plans to be developed in implementation of Law No. 2 of 2012.
Head of National Land Agency (BPN) Regulation No. 5 of 2012 regarding technical guide of land acquisition.	Regulates the procurement phase of the land and the authorities in the implementation of land acquisition.
Ministry of Mining and Energy Regulation No. 01.P/47/MPE/1992 regarding free space for high voltage and extra high voltage line for electric power distribution	Regulates space requirements for transmission lines, and requires land acquisition to be undertaken prior to construction.
Ministry of Energy and Mineral Resources No. 38 of 2013 regarding Compensation for land, building, and crop under high voltage and extra high voltage line	Regulates compensation that must be supplied by business proponent for land acquisition of high voltage and extra high voltage line free space.
Government Regulation No. 61 of 2012 regarding amendment of Government Regulation No. 24 of 2010 regarding forest area utilisation.	Implements Law No. 41 of 1999 regarding forest land use for non-forest activities. Contains the requirements and mechanisms of forest use to be done prior to development.
Presidential Decree No. 88 of 2017 regarding resolution on the land tenure within forestry area	Completion of land tenure in the forest area
Ministry of Environment and Forestry No. 50 of 2016 regarding Guidance on borrow lease on forest area.	Governs forest land utilisation for non-forestry purposes. The regulations provide the procedures and mechanisms of forest utilisation.
Spatial Planning	
Law No. 26 of 2007 regarding spatial planning	Regulates spatial planning and requires the Project to be within the industrial zone determined in the local government strategic planning for land use.
Ministry of Environment and Forestry Decree No 903 of 2016 regarding Forestry area in Riau Province.	Decree regarding the forestry status in Riau Province and used as a reference for Riau Province in building their spatial plan.
Law No. 13 of 2017 on Amendments to Government Regulation No. 26 of 2008 on The National Spatial Plan	The National Spatial Plan, spatial utilization and control for area which has national strategic value has significant relation to the National Spatial Planning therefore it considered to be covered by the authority of central government and the Government Regulation is set to resolve the problem of inconformity between the implementation of projects with national strategic values and regional regulations on spatial planning.

	The Riau 275MW CCPP is included Annex VA on Electricity Generation Infrastructure Network letter M Number 3 of Government Regulation No. 13 of 2017 on Amendment to Government Regulation Number 26 Year 2008 on National Spatial Plan and is subject to the requirements of Law No 13.

Appendix B. Environmental and Social Aspects Register

B.1 Introduction

In order to manage the adverse effects of its activities, and the activities of the EPC Contractor and Subcontractors, MRPR has to be able to identify, assess and control environmental, social and health and safety aspects that may have significant impact.

This section sets out the procedure for ensuring that all environmental, social and health and safety aspects with a potential to have adverse impacts are systematically identified and recorded on the Aspects Register (AR). The level of significance of each aspect's impact is determined and control measures are implemented to eliminate, isolate or minimise the effect. The procedure also describes how the AR is maintained and updated.

B.2 Responsibilities

Environmental, social and health and safety aspect identification and control is a shared responsibility between management and staff. Aspects will be systematically identified by examining the activities, products and services of the company.

Designated staff and management will be responsible for reviewing their work areas to consider the environmental aspects of their activities. The significance of the impact determined and targets introduced as part of the sites environmental management programme to effectively control/manage the aspect.

B.3 Definitions

Environmental, Social or Health and Safety Aspect

Element of an organisation's activities, products or services that can interact aspects related to the environment, social and health and safety.

Environment

Surroundings in which an organisation operates including, air, water, land, natural resources, flora, fauna, humans and their interaction.

Impact (effect)

Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organisations activities, products or services.

Consequence

The outcome of an event or situation expressed qualitatively or quantitatively, being a loss, or adverse impact, disadvantage or gain.

Frequency

A measure of likelihood expressed as the number of occurrences of an event in a given time.

Likelihood

A qualitative description of probability or frequency.

Probability

The likelihood of a specific outcome, measured by the ratio of specific outcomes to the total number of possible outcomes.

Risk

The measure both of the likelihood (frequency) and the consequences (severity) of a specified untoward event caused by an identified environmental aspect (hazard).

B.4 Aspects Identification

B.4.1 Aspect Categories

To assist with the process of identifying environmental, social or health and safety aspects the following categories are used.

1) Discharges to air: Activities which result in the discharge of contaminants to air, including particulates, chemicals, odour, microbiological agents etc.
2) Discharges to stormwater: Activities which can result in contaminants being discharged to stormwater.
3) Discharges to water: Activities which can discharge contaminants to natural waters.
4) Discharges to ground: Activities which can discharge contaminants to ground.
5) Discharges to groundwater: Activities that discharge contaminants directly to groundwater or discharge contaminants which by natural underlying process enter the groundwater.
6) Hazardous Wastes: Activities that generate hazardous waste (liquid and solid) which have to be neutralised, or treated or disposed offsite.
7) Storage and Handing of Hazardous Substances: Potential for accidental release which results in discharges to air, water or land.
8) Noise Emissions: Noise emissions beyond the site boundary that could result in complaints from interference, nuisance.
9) Waste Discharges: Solid and liquid wastes (non-hazardous) generated by an organisations activities, products or services that must be disposed of.
10) Liquid Discharges to Sewer: Trade waste discharges and loss of product.
11) Energy: Electrical, gas etc used in the process to produce products.
12) Historic activities: Activities undertaken at the site in the past with a potential to have resulted in residual ground, water contaminants.
13) Health and Safety: Potential for issues related to worker and community health and safety.

B.4.2 Determination of Significance

Significance of environmental impacts was determined using a qualitative approach. The following issues were considered for each aspect when determining significance.

1. Environmental concerns

a) the frequency of occurrence

b) duration of impact

c) offensiveness of impact

d) quantity of discharge

2. Business concerns

e) regulating/legal exposure

f) cost of changing the impact

g) difficulty in changing the impact

h) effect of damage on other processes and activities

i) effect on public image of the organisation

Categories of significance were developed as per Appendix D.

B.5 Procedure to Maintain and Update the Aspects Register

The AR that contains the base data from which MRPR's Environmental and Social Management Plan (ESMP) is developed. The environmental aspects of the organisation and their level of significance will change for the following reasons:-

1) ESMP targets have been achieved reducing the significance of the aspects effects;

2) changes to legislation;

3) new aspects introduced or modified by the introduction of new or changes to plant, equipment or operating procedures;

4) non-conformance reports issued due to incidents/accidents, internal environmental audits, environmental monitoring show non-compliance with consents, legal action etc.; and

5) re-assessment of a process or area.

Methods that will be followed to maintain and update the AR are as follows and is presented in Figure B-1.

B.5.1 Changes to Legislation

MRPR will maintain a procedure for updating legislative requirements pertaining to the sites activities.

The AR will be reviewed on a six monthly basis with respect to any legislative changes. The review will be performed by the MRPR Environment Manager. Additional aspects will be added to the register and the level of significance reviewed for recorded aspects.

For those aspects whose effect is modified to high a non-conformance report will be issued and the EAR adjusted accordingly. The non-conformance report will act as a means of adding a target or procedure to EMP to ensure compliance with the new requirement.

B.5.2 Management of Change

The management of environment aspects of the facility is a continuing process. If conditions change (activity change, process change or new equipment) the extent that the environmental aspects and their impact are affected by the change will be reviewed.

For every proposed change or new project the environmental aspects associated with the change (upstream and downstream) shall be identified the effect assessed and the level of significance determined.

The AR will be adjusted to account for these changes with aspects being added or deleted to account for these changes. In some instances only the level of significance may alter.

(Has the appropriate person in control of AR is advised of the changes will be need to be specified)

For those aspects of high significance new targets will have to be added to the aspects register.

B.5.3 Non-Conformances

Non-conformance reports will be generated with respect to:-

1) monitoring data indicating a non-compliance with a discharge limit
2) accident of incident investigation where an aspect is identified as needing to be reassessed or missed.
3) environmental aspect identified by a staff member who believes it is not on the register
4) result of an internal environmental audit.

On a six monthly basis the non-conformance reports shall be reviewed with respect to identifying/adjusting the AR.

The review will be undertaken by the AR Committee and will be based on the number of non-conformance, level of non-conformance, etc. adjust the level of significance up of an aspect. If a target has already been set then this will be reviewed to determine whether the performance indicates the completion date needs shorting or the level of priority is increased.

For those non-conformances which recommend immediate action, the AR will be adjusted to take into account the recommendation.

B.5.4 Internal Audits

As part of the ESMS internal auditing process, sections of the AR will be reviewed on a department basis. The audit aim is to ensure aspects recorded on the AR are still appropriate. There have been no changes that affected the AR. To add to the AR any aspects previously missed.

All aspects will be reviewed as to their level of significance and the AR adjusted accordingly.

The frequency of audits will be subject to the Internal Audit Programme.

B.5.5 Management Review

As part of the annual management review, the AR will be reviewed to ascertain changes made during the year due to changes, non-conformance etc. The AR will be adjusted to take into account changes from targets being achieved.

B.6 Environmental Impacts

The environmental aspects will be scored using the rating system set out in the tables below. Each aspect is assigned a rating for likelihood and another for consequence, which are used to determine the significance.

Table B.1 : Likelihood

Descriptor	Probability	Frequency	Historical
Almost Certain	>1 in 10	Several times per year	Has occurred frequently in the company
Likely	Between 1 in 10 and 1 in 100	About once per year	Has occurred once or twice in the company
Possible	Between 1 in 100 and 1 in 1,000	Once in 1-10 years	Has occurred many times in the industry
Unlikely	Between 1 in 1,000 and 1 in 10,000	Once in 10-100 years	Has occurred once or twice in the industry
Rare	<1 in 10,000	< Once in a 100 years	Unheard of in the industry

Table B.2: Consequence Rating

Descriptor	Safety	Cost	Schedule	Environment	Reputation
Catastrophic	1 or more fatalities or total permanent disability	>$10M	>2 years change to schedule	Permanent impact, long term (decades) regional impact	Adverse global media coverage. Major stakeholders terminate. Company at stake.
Major	1 or more partial disabilities	$1M-10M	1-2 years to change to schedule	Long term (decades) local area impact. Medium term (years) regional impact	Adverse national media coverage. Company on notice
Moderate	Lost time injury	$100k-$1M	6-12 months change to schedule	Medium term (years) local area impact. Short term(months) regional impact	Long term (weeks), local media and local interest
Minor	Medical attention, light duties	$10k-$100k	2-6 months change to schedule	Short term (months) local area impact	Short term (days), local media and local interest
Insignificant	Minor injury/illness. First aid needed. No lost time injury	$0-$!0k	<2 months change to schedule	Temporary impact (days/weeks) to immediate area	Local interest only, quickly forgotten

Table B.3: Significance Rating

Likelihood	Insignificant	Minor	Moderate	Major	Catastrophic
Almost Certain	6	12	18	30	36
Likely	5	10	15	25	30
Possible	3	6	9	15	18
Unlikely	2	4	6	10	12
Rare	1	2	3	5	6

Table B.4: Example Environmental Aspects Register

Aspect/Activity	Impact	Location	Likelihood	Severity	Significance	Mitigation	Likelihood	Severity	Treated Significance
Earthworks	Reduced visual amenity	Laydown Area	Likely	Minor	Medium	Minimise area of soil disturbance	Likely	Insignificant	Low
	Erosion and sedimentation	Laydown Area	Possible	Minor	Medium	Prepare Erosion and Soil Control Plan Seeding of stockpiled soil to stabilise Following completion of the exploration activities, assess whether disturbed areas such as access tracks are required for long term operations. Rehabilitate all disturbed areas not required for long-term operations using sterile seed mixes	Unlikely	Minor	Low
	Dust generation	Laydown Area	Likely	Minor	Medium	Seeding of stockpiled soil to stabilise Carry out watering of exposed areas and stockpiles as required to suppress dust.	Possible	Minor	Medium
	Noise disturbance	Laydown Area	Likely	Minor	Medium	Regular/routine community consultation/communication to ensure awareness of works programme amongst villagers. The use of machinery for earthworks will be limited to daylight hours	Likely	Insignificant	Medium

Aspect/Activity	Impact	Location	Likelihood	Severity	Significance	Mitigation	Likelihood	Severity	Treated Significance
	Contamination of land and/or groundwater from leaking fuel	Laydown Area	Possible	Minor	Medium	Maintain vehicles in good working order to prevent leaks of oil and fuel Vehicles to carry spill kits All personnel to be provided spill response training as part of site induction	Unlikely	Minor	Low
Construction/installation of temporary buildings	Reduced visual amenity	Laydown Area	Possible	Insignificant	Low		Possible	Insignificant	Low
	Noise disturbance	Laydown Area	Likely	Minor	Medium	The use of machinery to construct temporary buildings will be limited to daylight hours	Possible	Insignificant	Low
Lighting	Disturb local residents and fauna	Laydown Area	Almost Certain	Insignificant	Medium	Position lighting to shield adjacent dwelling as much as possible Turn off all unnecessary lighting at night to avoid attracting migratory birds Screen intake Horizontal intake rather than vertical	Possible	Minor	Low

B.7 Social Impacts

The social impacts will be scored by determining the potential consequence and likelihood of an impact and using these to calculate the significance. Consequence is calculated by determining the extent, duration and severity of an impact and adding these together.

Table B.5: Likelihood Table

Descriptor	Probability	Frequency	Historical
Almost Certain	>1 in 10	Several times per year	Has occurred frequently in the company
Likely	Between 1 in 10 and 1 in 100	About once per year	Has occurred once or twice in the company
Possible	Between 1 in 100 and 1 in 1,000	Once in 1-10 years	Has occurred many times in the industry
Unlikely	Between 1 in 1,000 and 1 in 10,000	Once in 10-100 years	Has occurred once or twice in the industry
Rare	<1 in 10,000	< Once in a 100 years	Unheard of in the industry

Table B.6: Consequence Rating

Descriptor	Safety	Cost	Schedule	Environment	Reputation
Catastrophic	1 or more fatalities or total permanent disability	>$10M	>2 years change to schedule	Permanent impact, long term (decades) regional impact	Adverse global media coverage. Major stakeholders terminate. Company at stake.
Major	1 or more partial disability	$1M-10M	1-2 years to change to schedule	Long term (decades) local area impact. Medium term (years) regional impact	Adverse national media coverage. Company on notice
Moderate	Lost time injury	$100k-$1M	6-12 months change to schedule	Medium term (years) local area impact. Short term(months) regional impact	Long term (weeks), local media and local interest
Minor	Medical attention, light duties	$10k-$100k	2-6 months change to schedule	Short term (months) local area impact	Short term (days), local media and local interest
Insignificant	Minor injury/illness. First aid needed. No lost time injury	$0-$!0k	<2 months change to schedule	Temporary impact (days/weeks) to immediate area	Local interest only, quickly forgotten

Table B.7: Significance Rating

Likelihood	Insignificant	Minor	Moderate	Major	Catastrophic
Almost Certain	6	12	18	30	36
Likely	5	10	15	25	30
Possible	3	6	9	15	18
Unlikely	2	4	6	10	12
Rare	1	2	3	5	6