Environmental and Social Impact Assessment Report (ESIA) – Lombok (Annex A-C)

Project No.: 51209-002
February 2018

INO: Eastern Indonesia Renewable Energy Project (Phase 2)

Prepared by ERM for PT Infrastruktur Terbarukan Lestari

ANNEX A APPLICABLE STANDARDS

Annex A provides a comparison of Indonesian and IFC emissions discharges which would be relevant to this project.

The IFC EHS Guidelines apply their own set of standards for specific effluents, emissions and discharges. Application of the IFC PS requires that when host country regulations differ from the levels and measures presented in the World Bank Group EHS Guidelines, projects are required to achieve whichever is the more stringent. If less stringent levels or measures than those provided in the EHS Guidelines are appropriate in view of specific project circumstances, a full and detailed justification must be provided for any proposed alternatives through the environmental and social risks and impacts identification and assessment process. This justification must demonstrate that the choice for any alternate performance levels is consistent with the objectives of IFC Performance Standard 3. As such it is important to engage with the Lender (or Lender's consultant) early in the regulatory EIA process so as to agree the applicable standards for the Project ESHIA and avoid potential delays or cost implications, particularly those that may affect engineering design decisions.

The following IFC and Indonesian regulatory standards are applicable to the Project:

Indonesian Regulations:

- Government Regulation No. 41 Year 1999 regarding Air Pollution Control;
- Ministry of Environment Decree No. 48 Year 1996 regarding Noise Level;
- Ministry of Manpower and Transmigration Decree No. PER.13/MEN/X/2011 regarding Threshold Limit Value of Physical Factors in the Work Environment;
- Government Regulation No. 82/2001 on management of water quality and control over water pollution;
- Ministry of Health Regulation No. 416/1990 concerning Water Quality Requirements and Monitoring;
- Ministry of Environment and Forestry Regulation Number P.68/Menlhk/Setjen/Kum.1/8/2016 regarding Domestic Wastewater Threshold;
- Government Regulation Number 101 year 2014 regarding Hazardous and Toxic Waste Management; and

World Bank Group EHS Guidelines:

- Environmental, Health, and Safety (EHS) Guidelines - General EHS Guidelines, April 30, 2007;

Annex A provides a comparison of standards relating to ambient environmental parameters and project emissions and discharges. The most stringent standard is highlighted for ease of reference.

A.1 Air Quality

Under Indonesian regulations, air quality is regulated by Government Regulation No. 41 Year 1999 regarding Air Pollution Control (PP41/1999). The IFC EHS Guidelines for ambient air quality state that to protect ambient air quality nationally legislated ambient air quality standards should be selected or in their absence for emitted compounds standards from the World Health Organisation (WHO) or other internationally recognised standards. Where standards exist under PP41/1999, these effectively become the IFC EHS guideline. Where standards do not exist under PP41/1999 for emitted compounds standards have been sought from WHO and EPA NSW in that order.

Table A.1 Ambient Air Quality[1]

Parameter	Period of Measurement	Unit	PP41/1999	IFC EHS Guidelines
Sulphur dioxide (SO_2)	10 minute	µg/m³	-	500 (guideline)
	1 hour	µg/m³	900	-
	24 hour	µg/m³	365	125 (Interim target-1) 50 (Interim target-2) 20 (guideline)
	1 year	µg/m³	60	-
Carbon monoxide (CO)	1 hour	µg/m³	30,000	-
	24 hour	µg/m³	10,000	-
Nitrogen dioxide (NO_2)	1 hour	µg/m³	400	200 (guideline)
	24 hour	µg/m³	150	-
	1 year	µg/m³	100	40 (guideline)
PM_{10}	24 hour		150	150 (Interim target-1) 100 (Interim target-2) 75 (Interim target-3) 50 (guideline)
	1 year	µg/m³		70 (Interim target-1) 50 (Interim target-2) 30 (Interim target-3) 20 (guideline)
$PM_{2.5}$	24 hour	µg/m³	65	75 (Interim target-1) 50 (Interim target-2) 37.5 (Interim target-3) 25 (guideline)
	1 year	µg/m³	15	35 (Interim target-1) 25 (Interim target-2) 15 (Interim target-3)

[1] World Health Organization (WHO). Air Quality Guidelines Global Update, 2005. PM 24-hour value is the 99th percentile.
Interim targets are provided in recognition of the need for a staged approach to achieving the recommended guidelines.

Parameter	Period of Measurement	Unit	PP41/1999	IFC EHS Guidelines
				10 (guideline)
Dust (TSP)	24 hour	µg/m³	230	-
	1 year	µg/m³	90	-

A.2 Noise Levels

Under Indonesian standards, the Decree of Environmental Ministry No. 48/1996 on Noise level Quality Standard and IFP regulates ambient noise. Noise health and safety limits are established under the Ministry of manpower Decree No 51 of 1999.

The IFC Performance Standards applicable for industrial noise applies to fixed noise sources only. Noise impacts should not exceed the levels presented in **Table A.2**, or result in a maximum increase in background levels greater than 3 dB at the nearest receptor location off-site.

Table A.2 Noise Standards (dBA)[2]

Site	MoE Dec. #48/1996	Ministry of Manpower and Transmigration Decree No. PER.13/MEN/X/2011	IFC EHS Guidelines*	
			Daytime (07:00 - 22:00)	Night-time (22:00 - 07:00)
Residential; Institutional; educational	55		55	45
Industrial Area	70	-		
Occupational Health & Safety (exposure limits)		**Exposure Limit/Day**	**LAeq, 8h**	**Max LAmax, fast**
		-	40-45 (closed offices)	-
		-	45-50 (Open offices)	-
		85 (8 hours)	85 (heavy industry)	110 (heavy industry)
		88 (4 hours)		
		91 (2 hours)		
		94 (1 hours)		
		97 (30 minutes)		

*LAeq (dBA)

A.3 Water Quality

The IFC does not establish standards for surface water quality. Indonesian standards are established by Government Regulation (PP) #82/2001 on Water Quality Management and Water Pollution Control, which includes different classes according to use. It is unlikely that

[2] Source: Ministry of Environment Decree #48, 1996
Ministry of Manpower Decree 51, 1999
IFC General EHS Guidelines. Guidelines values are for noise levels measured out of doors. Source: Guidelines for Community Noise, World Health Organization (WHO), 1999.
Acceptable indoor noise levels for residential, institutional, and educational settings (WHO 1999).

local rivers would be affected by the Project and hence these standards may not directly apply. Class I is applicable for drinking water (Class I) and Classes II-IV as water suitable for use for recreational, fresh water fish cultivation, livestock and irrigation.

Table A.3 Water Quality

Parameters	Units	IFC	PP 82/2001 Class I	PP 82/2001 Class II	PP 82/2001 Class III	PP 82/2001 Class IV
Physical Tests						
Temperature	°C	-	3 deviation	3 deviation	3 deviation	3 deviation
pH	-	-	6 - 9	6 - 9	6 - 9	5 - 9
Hardness (calc)		-	-	-	-	-
Total Dissolved Solids, TDS	mg/L	-	1,000	1,000	1,000	2,000
Total Suspended Solids, TSS	mg/L	-	50	50	400	400
Anions & Nutrients						
Fluoride, F	mg/L	-	0.5	1.5	1.5	-
Chloride, Cl	mg/L	-	600	-	-	-
Sulphate, SO_4	mg/L	-	400	-	-	-
Nitrate Nitrogen, NO_3-N	mg/L	-	10	10	20	20
Nitrite Nitrogen, as N	mg/L	-	0.06	0.06	0.06	-
Total Phosphate, T-PO_4 sebagai P	mg/L	-	0.2	0.2	1	5
Sulphide, H_2S	mg/L	-	0.002	0.002	0.002	-
Free Ammonia Nitrogen, NH_3-N	mg/L	-	0.5	-	-	-
Cyanide, CN	mg/L	-	0.02	0.02	0.02	-
Dissolve Metals						
Arsenic, As	mg/L	-	0.05	1	1	1
Barium, Ba	mg/L	-	1	-	-	-
Boron, B	mg/L	-	1	1	1	1
Cadmium, Cd	mg/L	-	0.01	0.01	0.01	0.01
Chromium Hexavalent, (Cr^{6+})	mg/L	-	0.05	0.05	0.05	0.01
Cobalt, Co	mg/L	-	0.2	0.2	0.2	0.2
Copper, Cu	mg/L	-	0.02	0.02	0.02	0.2
Iron, Fe	mg/L	-	0.3	-	-	-
Lead, Pb	mg/L	-	0.03	0.03	0.03	1
Manganese, Mn	mg/L	-	0.1	-	-	-
Mercury, Hg	mg/L	-	0.001	0.002	0.002	0.005
Selenium, Se	mg/L	-	0.01	0.05	0.05	0.05
Zinc, Zn	mg/L	-	0.05	0.05	0.05	2
Microbiology						
Fecal Coliform	MPN/100ml	-	100	1000	2000	2000

Parameters	Units	IFC	PP 82/2001 Class I	PP 82/2001 Class II	PP 82/2001 Class III	PP 82/2001 Class IV
Total Coli form	MPN/100ml	-	1,000	5000	10000	10000
Others						
Biochemical Oxygen Demand, BOD	mg/L	-	2	3	6	12
Dissolve Oxygen, DO	mg/L	-	6	4	3	0
Chlorine, Cl_2	mg/L	-	0.03	0.03	0.03	-
Chemical Oxygen Demand, COD	mg/L	-	10	25	50	100
Surfactant, MBAS	µg/L	-	200	200	200	-
Oil & Grease	mg/L	-	1	1	1	1
Senyawa Phenol, as Phenol	µg/L	-	1	1	1	-
BHC	µg/L	-	210	210	210	-
Aldrin/Dieldrin	µg/L	-	17	-	-	-
Chlordane	µg/L	-	3	-	-	-
DDT	µg/L	-	2	2	2	2
Heptachlor and Heptachlor epoxide	µg/L	-	18	-	-	-
Lindane	µg/L	-	56	-	-	-
Methoxychlor	µg/L	-	35	-	-	-
Endrin	µg/L	-	1	4	4	-
Toxaphane	µg/L	-	5	-	-	-
Radioactivity						
Gross-A	Bq/L	-	0.1	0.1	0.1	0.1
Gross- B	Bq/L	-	1	1	1	1

Class I water used as raw water for drinking water, or other uses that require water quality similar as aforementioned

Class II water used for infrastructure / water recreation facilities, freshwater fish farming, livestock, water for irrigating crops or other uses that require water quality similar as aforementioned

Class III water used for freshwater fish farming, livestock, water for irrigating crops or other uses that require water quality similar as aforementioned

Class IV water used to irrigate crops and or other uses that require water quality similar as aforementioned

A.4 Groundwater Quality

The IFC does not establish standards for groundwater quality. Indonesian standards are established by the Regulation of Health Ministry No. 416/1990 in Appendix II.

Table A.4 Groundwater Quality

Parameters	Units	Regulation of Health Ministry 416/1990 Appendix II
Physical Tests		
Colour	TCU	50
Odour	-	No odour
Temperature	°C	± 3
Taste	-	No taste
Total Hardness as CaCO3	mg/L	500
Total Dissolved Solids, TDS	mg/L	1500
pH	-	6.5 - 9
Turbidity	NTU	25
Anions & Nutrients		
Chloride, Cl	mg/L	600
Fluoride, F	mg/L	1.5
Nitrate Nitrogen, NO3-N	mg/L	10
Nitrite Nitrogen, NO2-N	mg/L	1
Sulphate, SO4	mg/L	400
Cyanide, CN-	mg/L	0.1
Sulphide, H2S	mg/L	-
Microbiology Tests		
Total Coli form	MPN/100ml	50
Fecal Coliform	MPN/100ml	10
Dissolve Metals		
Arsenic, As	mg/L	0.05
Cadmium, Cd	mg/L	0.005
Chromium Hexavalent, (Cr6+)	mg/L	0.05
Copper, Cu	mg/L	-
Iron, Fe	mg/L	1
Lead, Pb	mg/L	0.05
Manganese, Mn	mg/L	0.5
Mercury, Hg	mg/L	0.001
Selenium, Se	mg/L	0.01
Sodium, Na	mg/L	-
Zinc, Zn	mg/L	15
Organic Chemistry		
Aldrin dan Dieldrin	mg/L	0.0007
Benzena	mg/L	0.01
Benzo (a) pyrene	mg/L	0.00001
Chlordane (total isomer)	mg/L	0.007
Coloroform	mg/L	0.03
2,4 D	mg/L	0.1
DDT	mg/L	0.03
Detergen	mg/L	0.5

Parameters	Units	Regulation of Health Ministry 416/1990 Appendix II
1,2 Discloroethane	mg/L	0.01
1,1 Discloroethene	mg/L	0.0003
Heptaclor dan heptaclor epoxide	mg/L	0.003
Hexachlorobenzene	mg/L	0.00001
Gamma-HCH (Lindane)	mg/L	0.004
Methoxychlor	mg/L	0.03
Pentachlorophanol	mg/L	0.01
Pestisida Total	mg/L	0.1
2,4,6 urichlorophenol	mg/L	0.01
Zat organik (KMnO4	mg/L	10
Radioactivity		
Gross Alpha Activity)	Bq/L	0.1
Gross Beta Activity)	Bq/L	1

A.5 Domestic Wastewater Standards

Table A.5 Domestic Wastewater

Parameter	*Unit*	*MoEF Regulation N. P.68/Menlhk/Setjen/ Kum.1/8/2016**	*IFC EHS Guidelines Indicative Values for Treated Sanitary Sewage Discharges*
pH	-	6 – 9	6 – 9
BOD	mg/L	30	30
COD	mg/L	100	125
TSS	mg/L	30	50
Total nitrogen	mg/L		10
Total phosphorus	mg/L		2
Oil and grease	mg/L	5	10
Ammoniac	Mg/L	10	
Total Coliform	Amount/100mL	3000	
Total coliform bacteria	MPN[b] / 100 ml		400[a]

Notes:

*Ministry of Environment and Forestry Regulation Number P.68/Menlhk/Setjen/Kum.1/8/2016 regarding Domestic Wastewater Threshold

IFC EHS Guidelines:

1. Not applicable to centralised, municipal, wastewater treatment systems which are included in EHS guidelines for water and sanitation
2. MPN = Most Probable Number

A.6 Hazardous and Toxic Waste

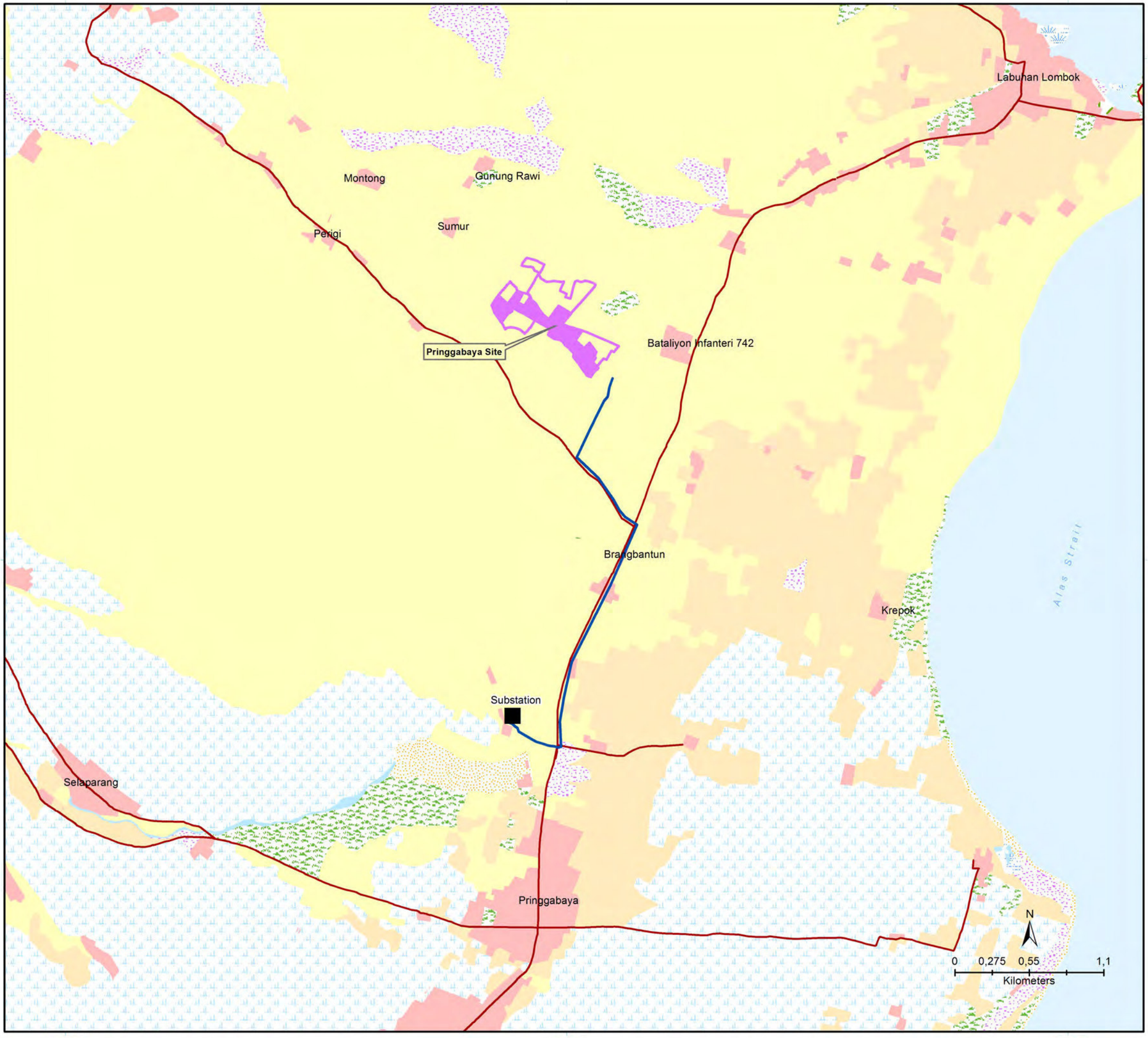
Hazardous and toxic waste management is regulated in Government Regulation Number 101 Year 2014 regarding Hazardous and Toxic Waste Management, and also IFC EHS Guidelines as stated in the body document sub-chapter 2.9.3.

ANNEX B MAP AREA OF INFLUENCE

EQUIS

ENVIRONMENTAL AND SOCIAL HEALTH IMPACT ASSESSMENT (ESHIA)
SOLAR FARM PROJECT AND 20-KV TRANSMISSION LINE
IN PRINGGABAYA, SELONG AND SENGKOL
NUSA TENGGARA BARAT PROVINCE, INDONESIA

LAND COVER PRINGGABAYA SITE



LEGEND

- Capital of Regency
- District Boundary
- Regency Boundary
- Road
- River
- Transmission Line
- Solar Farm Area

Land Cover

- Water Body
- Shrub
- Rock Hills
- Forest
- Plantation
- Sandy
- Settlement
- Salting
- Grass
- Paddy Field
- Dryland Agriculture

Note:
This map is not an official reference to administrative boundaries.
If there is a mistake, the reference is the official map
which issued by Indonesia Government

Sources:
- Landcover Map, Ministry of Environmental and Forestry. 2016
- NTB Administration Map, NTB Province.
- RFP ESHIa Study for Lombok Solar Farm Project. Redaya Energy. 2017
- Indicative moratorium Map Rev XI. 2016. Ministry of Environmnet and Forestry

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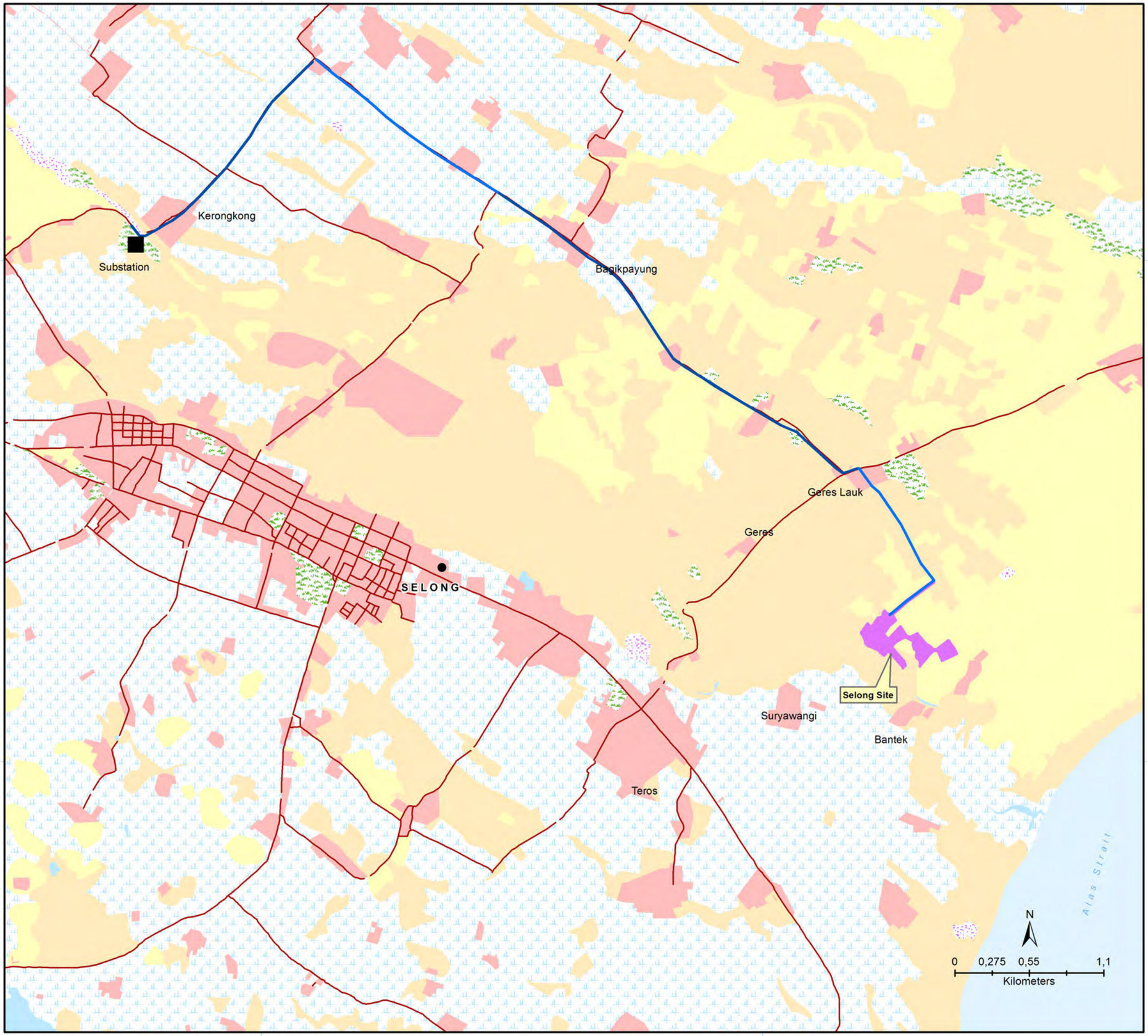
Checked By :	RA	Date :	09/02/2018
Revision :		Map Number:	

EQUIS

ENVIRONMENTAL AND SOCIAL HEALTH IMPACT ASSESSMENT (ESHIA)
SOLAR FARM PROJECT AND 20-KV TRANSMISSION LINE
IN PRINGGABAYA, SELONG AND SENGKOL
NUSA TENGGARA BARAT PROVINCE, INDONESIA

LAND COVER SELONG SITE



LEGEND

- Capital of Regency
- District Boundary
- Regency Boundary
- Road
- River
- Transmission Line
- Solar Farm Area

Land Cover

- Water Body
- Shrub
- Rock Hills
- Forest
- Plantation
- Sandy
- Settlement
- Salting
- Grass
- Paddy Field
- Dryland Agriculture

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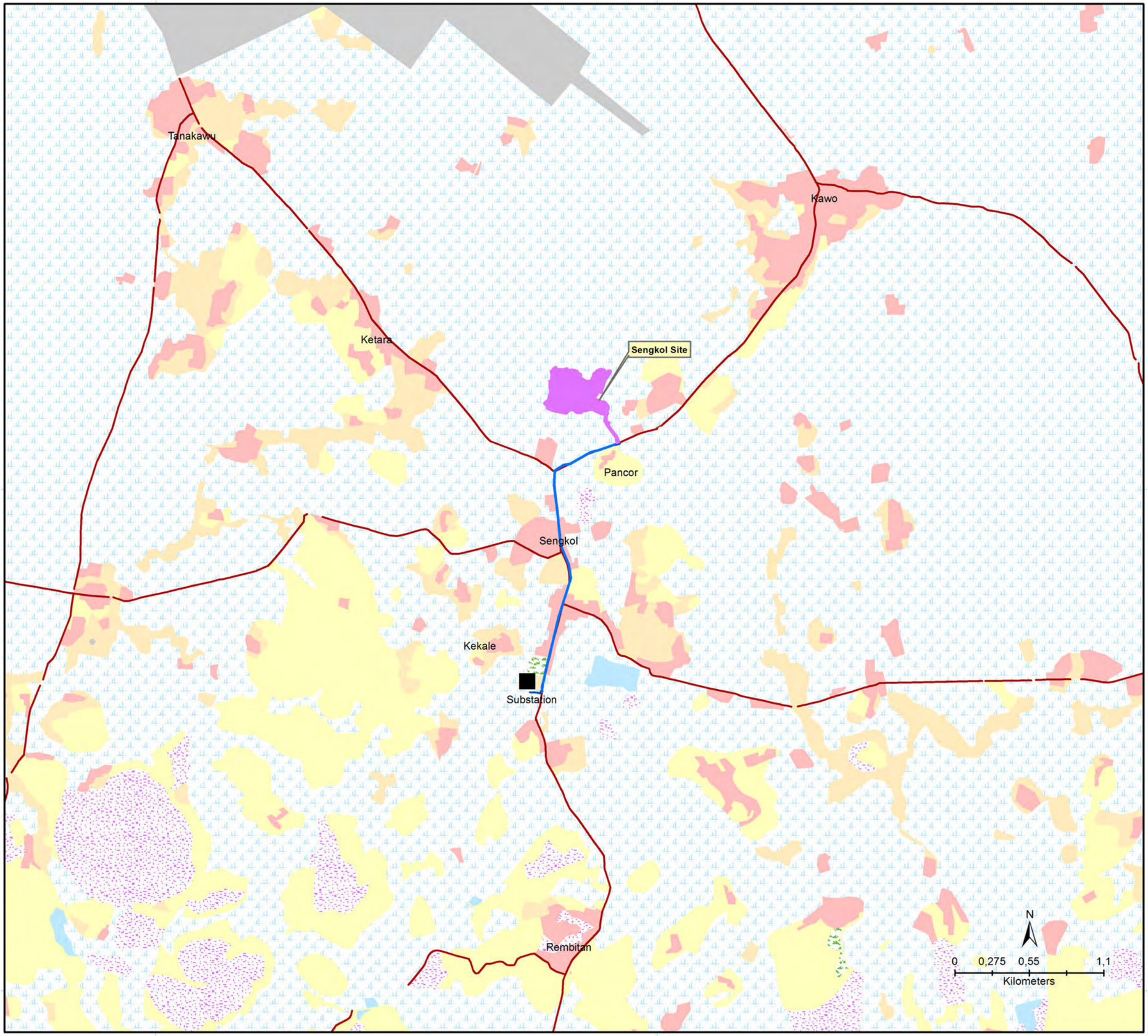

EQUIS

ENVIRONMENTAL AND SOCIAL HEALTH IMPACT ASSESSMENT (ESHIA)
SOLAR FARM PROJECT AND 20-KV TRANSMISSION LINE IN PRINGGABAYA, SELONG AND SENGKOL
NUSA TENGGARA BARAT PROVINCE, INDONESIA

LAND COVER SENGKOL SITE

LEGEND

- Capital of Regency
- District Boundary
- Regency Boundary
- Road
- River
- Transmission Line
- Solar Farm Area

Land Cover

- Water Body
- Shrub
- Airport Area
- Forest
- Plantation
- Sandy
- Settlement
- Salting
- Grass
- Paddy Field
- Dryland Agriculture

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Checked By :	RA	Date :	09/02/2018
Revision :		Map Number:	

ANNEX C INDIGENOUS PEOPLES IMPACTS SCREENING CHECKLIST

Indigenous Peoples Impact Screening Checklist

KEY CONCERNS	YES	NO	NOT KNOWN	REMARKS
A. Indigenous Peoples Identification				
1. Are there socio-cultural groups present in or use the project area who may be considered as "tribes" (hill ribes, schedules tribes, tribal peoples), "minorities" or "indigenous communities" in the project area?		**V**		80% of Lombok Timur and Lombok Tengah Regencies are from the Sasak Tribe. But there is no statistical information on the population of ethnic groups and the diversity in Lombok Timur and Lombok Tengah Regencies. There is no data about the indigenous people.
2. Are there national or local laws or policies as well as anthropological researches/studies that consider these groups present in or using the project area as belonging to "ethnic minorities", scheduled tribes, tribal peoples, national minorities, or cultural communities?			**V**	There are customary institutions in Sengkol and Pringgabaya Utara Villages (there is no available information regarding village institutions in Geres Village. But there is no further information regarding the detail about "ethnic minorities" belonging the project area, schedule tribes, etc.
3. Do such groups self-identify as being part of a distinct social and cultural group?		**V**		Eventhough the majority of the population is from Sasak Tribe, there are diverse ethnic groups also living in the three villages (Pringgabaya Utara, Geres and Sengkol) from other provinces (East Java, Madura, and Bali).
4. Do such groups maintain collective attachments to distinct habitats or ancestral		**V**		

KEY CONCERNS	YES	NO	NOT KNOWN	REMARKS
territories and/or to the natural resources in these habitats and territories?				
5. Do such groups maintain cultural, economic, social, and political institutions distinct from the dominant society and culture?	**V**			
6. Do such groups speak a distinct language or dialect?	**V**			Local Language.
7. Has such groups been historically, socially and economically marginalized, disempowered, excluded, and/or discriminated against?			*Not applicable*	Considering the population in Lombok Timur Regency, poverty has become a heavy burden, with about 18.46 percent or 216,000 people considered poor. Lombok Timur is ranked as having the second largest percentage of poor people. Based on ERM's Rapid observation in the Project location of Selong site revealed diverse economic profiles of the neighbouring communities. In the Geres Barat neighbourhood, some houses are made of bamboo sheets whilst some are adequately built with concrete materials.
8. Are such groups represented as "Indigenous Peoples" or as "ethnic minorities" or "scheduled tribes" or		**V**		There are a number of respected key figures that can influence the Decision-Making of community in Pringgabaya Utara, Geres and Sengkol

KEY CONCERNS	YES	NO	NOT KNOWN	REMARKS
"tribal populations" in any formal decision-making bodies at the national or local levels?				Village; religious leaders are the most respected, followed by government officials and education professionals
B. Identification of Potential Impacts				
9. Will the project directly or indirectly benefit or target Indigenous Peoples?		**V**		The project will directly or indirectly benefit the community overall.
10. Will the project directly or indirectly affect Indigenous Peoples' traditional socio-cultural and belief practices? (e.g. child-rearing, health, education, arts, and governance).	**V**			Based on chapter 6.3 , there are a couple of potential impact such as Impact to Community Safety. But there are also mitigation measures to reduce the impact of the project.
11. Will the project affect the livelihood systems of Indigenous Peoples? (e.g., food production system, natural resource management, crafts and trade, employment status)	**V**			Based on chapter 6.3 there are Impacts from loss of land resource and Impact to Local Economy from Employment and Business Opportunities during the Project Construction and Operation;
12. Will the project be in an area (land or territory) occupied, owned, or used by Indigenous Peoples, and/or claimed as ancestral domain?		**V**		Three sites area are not located within nor do they intersect an area of conservation importance
C. Identification of Special Requirements *Will the project activities include:*				
13. Commercial development of the cultural resources and knowledge of Indigenous		**V**		

KEY CONCERNS	YES	NO	NOT KNOWN	REMARKS
Peoples?				
14. Physical displacement from traditional or customary lands?		V		
15. Commercial development of natural resources (such as minerals, hydrocarbons, forests, water, hunting or fishing grounds) within customary lands under use that would impact the livelihoods or the cultural, ceremonial, spiritual uses that define the identity and community of Indigenous Peoples?		V		
16. Establishing legal recognition of rights to lands and territories that are traditionally owned or customarily used, occupied or claimed by indigenous peoples ?		V		The land for solar farm is being purchased from 31 land owners for all three sites. There is no lands or territories that claimed by indigenous people. In Pringgabaya and Selong, the vegetation is modified habitat consisting of predominantly dryland plantation with corn and cassava; however during the survey scrub and bush covered most of the project area. The productivity of the land is low because of low average monthly rainfall there is only 1-2 cropping seasons in a year. Sengkol consists of mostly rice field and plantation with paddy, coconuts, and

KEY CONCERNS	YES	NO	NOT KNOWN	REMARKS
				cassava are dominant.
17. Acquisition of lands that are traditionally owned or customarily used, occupied or claimed by indigenous peoples ?		**V**		All of the lands are owned by an individual person, not claimed by indigenous people.

D. Anticipated project impacts on Indigenous Peoples

Project component/ activity/ output	Anticipated positive effect	Anticipated negative effect
N/A	N/A	N/A