

# Environmental Monitoring Report

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# Semiannual Report  
July-December 2021  
January 2022

## Indonesia: West Kalimantan Power Grid Strengthening Project – Part 1

Prepared by Pusat Manajemen Proyek (Pusmanpro) for the PT PLN and the Asian Development Bank.

## **CURRENCY EQUIVALENTS**

(as of 31 December 2021)

Currency unit	–	Indonesian rupiah (Rp)
Rp1.00	=	\$ 0.0000700722
\$1.00	=	Rp 14,271.000000

### **NOTE**

- (i) In this report, "\$" refers to US dollars.

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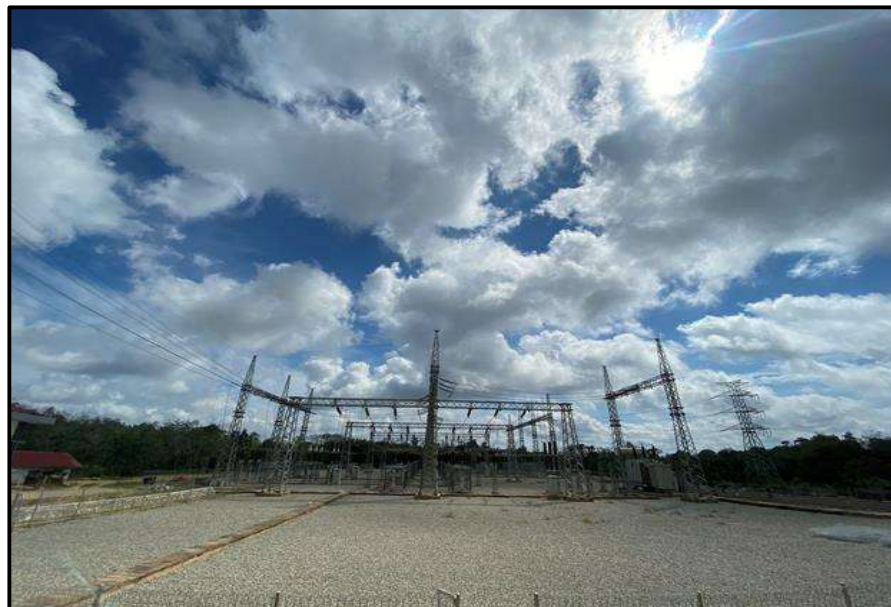
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## **PT PLN (PERSERO) UIP KALBAGBAR**

Jl. Letjend. Suprpto No. 50 G, Pontianak  
Kalimantan Barat

### **Annual Environmental Monitoring Report in Operation Phase (January - December 2021) and Semi-Annual Environmental Monitoring Report in Construction Phase (July – December 2021) for West Kalimantan Power Grid Strengthening Project**



**ADB Loan No. 3015-INO  
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## Abbreviations

ADB	-	Asian Development Bank
AFD	-	Agence Française de Développement
EHS	-	Environmental Health and Safety
EMF	-	Electromagnetic Fields
EMP	-	Environmental Management Plan
HVTL		High Voltage Transmission Line
IEE	-	Initial Environmental Examination
SS	-	Substation
TL	-	Transmission Line
UIP KLB	-	PT PLN (Persero) Unit Induk Pembangunan West Region of Kalimantan
UPP Kalbagbar 1	-	PT PLN (Persero) Unit Pelaksana Proyek West Region of Kalimantan 1
OHSMS	-	Occupational Health and Safety Management System (known as Sistem Manajemen Keselamatan Kerja or SMK3 according to the requirement of Indonesian Government)
PIC	-	Project Implementation Consultant
PIU	-	Project Implementation Unit
PLN	-	PT Perusahaan Listrik Negara (Persero) is the state-owned electricity company
PMU	-	Project Management Unit
PNPB	-	<i>Penerimaan Negara Bukan Pajak</i> (Non-Tax State Revenue)
PSDH	-	<i>Provisi Sumber Daya Hutan</i> (Provision of Forest Resources; Indonesia)
ROW	-	Right of Way
UKL -UPL	-	Upaya Pengelolaan Lingkungan dan Upaya Pemantauan Lingkungan (environmental management and monitoring effort document)
UP3B KALBAR	-	Unit Pelaksana Penyaluran dan Pengaturan Beban (Dispatch Unit) West Region of Kalimantan

## Table of Contents

Abbreviations .....	i
Table of Contents.....	ii
List of Tables .....	iii
List of Appendices.....	iv
Chapter 1 Introduction.....	1
Chapter 2 Summary of the Project's Progress.....	3
Chapter 3 Environmental Mitigation Measures and Status .....	5
3.1 Package 1: Bengkayang – Jagoibabang Transmission Lines (Operation Phase) .....	6
3.2 Package 2: Bengkayang Substation (Operation Phase) .....	9
3.3 Package 3: Bengkayang – Ngabang – Tayan Transmission Lines (Operation Phase) .....	12
3.4 Package 4: Ngabang and 1 <sup>st</sup> Extension of Tayan Substation (Operation Phase).....	15
3.5 Package 5: Sanggau and Sekadau Substations (Construction Phase).....	18
3.6 Package 5: 2 <sup>nd</sup> Extension of Tayan and Sanggau Substations (Operation Phase) .....	27
3.7 Packages 6 and 7: Tayan - Sanggau - Sekadau Transmission Lines (Construction Phase).....	30
3.8 Package 6 : Tayan – Sanggau Transmission Line (Operation Phase) .....	40
Chapter 4 Environmental Monitoring Status .....	43
4.1 Package 1: Bengkayang - Jagoibabang Transmission Lines (Operation Phase).....	44
4.2 Package 2: Bengkayang Substation (Operation Phase) .....	45
4.3 Package 3: Bengkayang-Ngabang-Tayan Transmission Lines (Operation Phase) .....	46
4.4 Package 4: Ngabang Substation and 1st Extension of Tayan Substation (Operation Phase).....	47
4.5 Package 5: Sanggau and Sekadau Substations (Construction Phase).....	48
4.6 Package 5: 2 <sup>nd</sup> Extension of Tayan and Sanggau Substations (Operation Phase) .....	53
4.7 Packages 6 and 7: Tayan-Sanggau and Sanggau-Sekadau Transmission Lines (Construction Phase).....	54
4.8 Packages 6 : Tayan-Sanggau Transmission Line (Operation Phase).....	59
Chapter 5 Findings on EMP Implementation and Corrective Actions.....	60
Chapter 6 Status of Corrective Actions Identified at ADB Evaluation Meeting .....	63
Chapter 7 Conclusions and Recommendations.....	64

## List of Tables

Table 2.1	Summary of the Work Progress (as of December 2021) .....	3
Table 3.1	Environmental Mitigation Status of Package 1 (Operation Phase) .....	6
Table 3.2	Environmental Mitigation Status of Package 2 (Operation Phase) .....	9
Table 3.3	Environmental Mitigation Status of Package 3 (Operation Phase) .....	12
Table 3.4	Environmental Mitigation Status of Package 4 (Operation Phase) .....	15
Table 3.5	Environmental Mitigation Status of Sanggau and Sekadau Substations (Construction Phase) .....	18
Table 3.6	Environmental Mitigation Status of Phase 2 Tayan Extension and Sanggau Substations (Operation Phase) .....	27
Table 3.7	Environmental Mitigation Status of Packages 6 and 7 (Construction Phase) .....	30
Table 3.8	Environmental Mitigation Status of Package 6 (Operation Phase) .....	40
Table 4.1	Environmental Monitoring Status of Package 1 (Operation Phase) .....	44
Table 4.2	Environmental Monitoring Status of Package 2 (Operation Phase) .....	45
Table 4.3	Environmental Monitoring Status of Package 3 (Operation Phase) .....	46
Table 4.4	Environmental Monitoring Status of Package 4 (Operation Phase) .....	47
Table 4.5	Environmental Monitoring Status of Package 5 (Construction Phase) .....	48
Table 4.6	Environmental Monitoring Status of Package 5 (Operation Phase) .....	53
Table 4.7	Environmental Monitoring Status of Packages 6 and 7 (Construction Phase) .....	54
Table 4.8	Environmental Monitoring Status of Packages 6 (Operation phase) .....	59

## **List of Appendices**

- Appendix 1 Project Organization Chart
- Appendix 2 Mitigation Implementations of 275 kV Bengkayang – Jagoibabang Transmission Lines (Operation Phase)
- Appendix 3 Mitigation Implementations of 275/150 kV Bengkayang Substation (Operation Phase)
- Appendix 4 Mitigation Implementations of 150 kV Bengkayang – Ngabang – Tayan Transmission Lines (Operation Phase)
- Appendix 5 Mitigation Implementations of 150/20 kV Ngabang Substation and Tayan Extension Substation (Operation Phase)
- Appendix 6 Mitigation Implementations of 150/20 kV Tayan Extension, Sanggau, and Sekadau Substations (Construction Phase)
- Appendix 7 Mitigation Implementations of 150/20 kV Tayan Extension and Sanggau (Operation Phase)
- Appendix 8 Mitigation Implementations of 150 kV Tayan – Sanggau and Sanggau – Sekadau Transmission Lines (Construction Phase)
- Appendix 9 Mitigation Implementations of 150 kV Tayan – Sanggau Transmission Line (Operation Phase)
- Appendix 10 Monitoring Results
- Appendix 11 Mission Findings Evidence

## Chapter 1 Introduction

**Project Background.** The Government of the Republic of Indonesia has signed the loan agreements with the Asian Development Bank (ADB) and the Agence Française de Développement (AFD) to provide funding required by PT Perusahaan Listrik Negara or PLN (Persero) for the West Kalimantan Power Grid Strengthening Project (“the project”). The project primarily includes construction of power transmission lines and substations, and expansion of existing substations as shown in **Map 1**. The project covers the following construction packages:

- Package 1: 81.3km long of 275 kV power transmission line from Bengkayang to Jagoibabang (the border with Sarawak, Malaysia);
- Package 2: 275/150 kV Bengkayang substation;
- Package 3: 95.6km long of 150 kV power transmission line from Bengkayang to Ngabang and 46.8km long of 150 kV line from Ngabang to Tayan;
- Package 4: 150/20 kV Ngabang and 1<sup>st</sup> extension of Tayan substations;
- Package 5: 150/20 kV Sanggau, Sekadau and 2<sup>nd</sup> extension of Tayan substations;
- Package 6: 77.58km long of 150/20 kV power transmission line from Tayan to Sanggau; and
- Package 7: 46.66km long of 150/20 kV power transmission line from Sanggau to Sekadau.

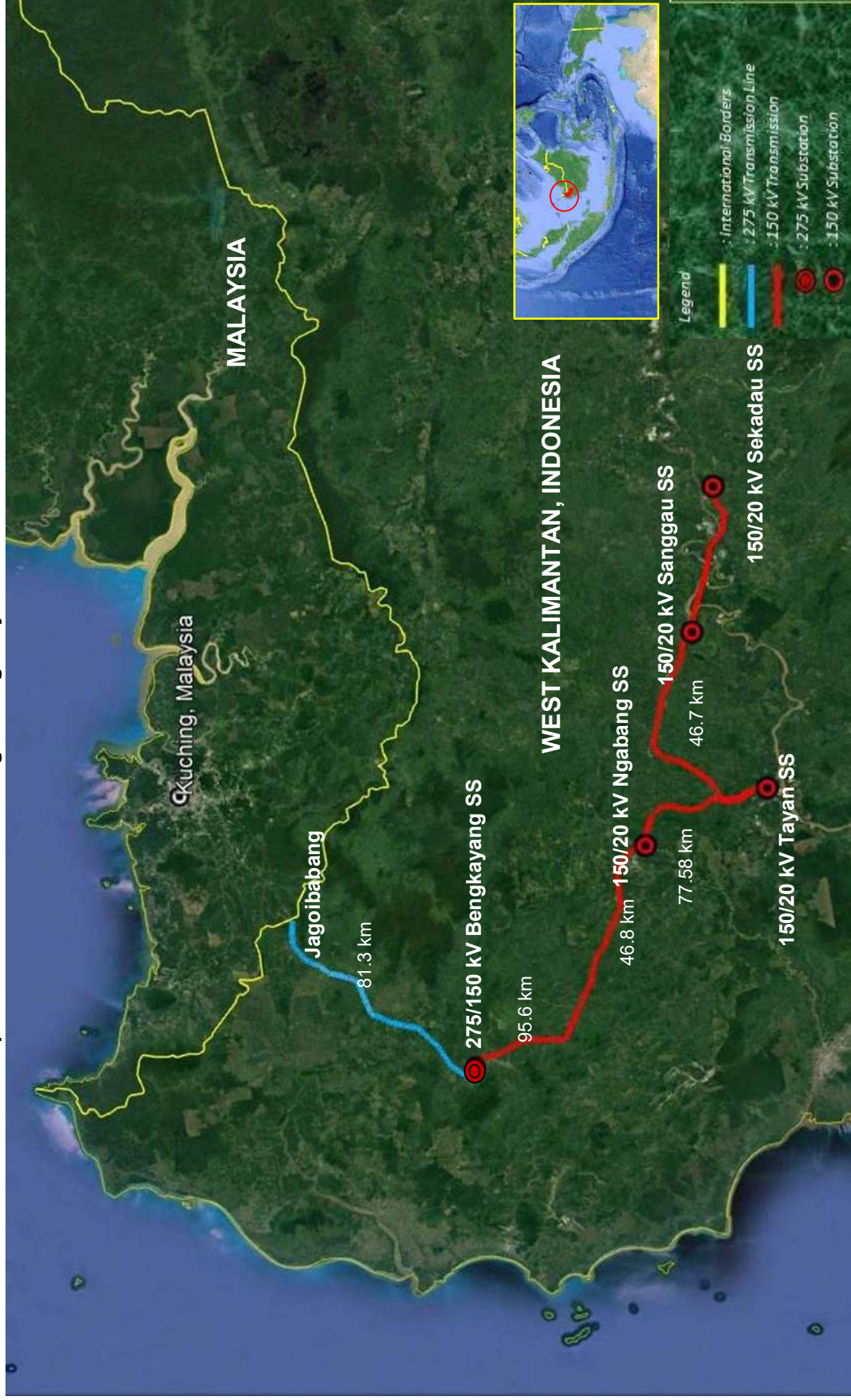
**Scope of this Monitoring Report.** *Pusat Manajemen Konstruksi* (PUSMANKON), as the construction management unit of PT *Perusahaan Listrik Negara* (Persero), has been conducting the project supervision including environmental, health and safety (EHS) monitoring of the project since August 2017, replacing the joint venture of Tractebel Engineering Ltd. and Power Grid International Limited (Thailand). Since then, PUSMANKON as the Project Implementation Consultant (PIC) has also been producing the semi-annual environmental monitoring reports (SAEMR) for the project. Since September 2018, the name of PUSMANKON has been changed to *Pusat Manajemen Proyek* (PUSMANPRO).

PLN Headquarters as the Project Management Unit (PMU) is responsible for managing the project implementation. UIP KALBAGTIM in Balikpapan (East Kalimantan) was the Project Implementation Unit (PIU) was responsible for managing the construction of Packages 1 and 2, which have been completed in 2016 and handed over to UIKL Kalimantan-UP3B Kalbar as PLN power generation and dispatch unit to monitor in the operation phase. UIP KALBAGBAR (now known as UIP KLB) in Pontianak (West Kalimantan) is responsible for managing Packages 3-7. UPP Kalbagbar 3 as the PIU subunit in Singkawang had supported the construction for Packages 3 and 4, which was completed in 2018 and handed over to UIKL Kalimantan-UP3B Kalbar in 2020. UPP KBB 2 in Sintang supports the construction for Packages 5 to 7. Due to PLN organizational change in 2021, UPP Kalbagbar 1 in Pontianak has replaced UPP KBB 2. Project organization charts including EHS responsibilities are present in **Appendix 1**.

Semi-annual environmental monitoring report of July – December 2021 describes implementation of EMP’s project for Packages 1 to 4, Package 5 (Tayan SS) and Package 6 (Tayan - Sanggau TL) that have been operated, then Packages 5 (Sanggau and Sekadau SS), tower retaining wall in Package 6 and Package 7 that are in the construction phase.



Map 1 PLN Power Grid Strengthening Project in West Kalimantan



Source: PT PLN (Persero)

## Chapter 2 Summary of the Project's Progress

The status/progress of the project is summarized in **Table 2.1**. The project operation activities conducted in January – December 2021 monitoring period is for the transmission line from Jagoibabang to Sanggau including associated substations. Whereas, the construction activities conducted in July – December 2021 monitoring period is for the transmission line from Sanggau to Sekadau with associated substations. Flooding in most areas of West Kalimantan in November 2021 had caused delays in project construction in Packages 6 and 7. Any complaints that arise from society are mostly related to social impact and are not directly related to the environmental aspects.

**Table 2.1 Summary of the Work Progress (as of December 2021)**

Project Packages	Status	Responsible Party
Package 1: 275 kV Bengkayang – Jagoibabang Power Transmission Lines	In operation since 5 April 2016	UP3B KALBAR (Power Dispatch Unit)
Package 2: 275/150 kV Bengkayang Substation	In operation since 29 December 2015	UP3B KALBAR (Power Dispatch Unit)
Package 3: 150 kV Bengkayang - Ngabang – Tayan Power Transmission Lines	In operation since 1 June 2018	UP3B KALBAR (Power Dispatch Unit)
Package 4: 150/20 kV Ngabang Substation and 1 <sup>st</sup> extension of Tayan Substation	In operation since 10 September 2018	UP3B KALBAR (Power Dispatch Unit)
Package 5: 150/20 kV Sanggau and Sekadau Substations and 2 <sup>nd</sup> extension of Tayan substation	<p><b>Overall progress: 98.362/100%</b> (agreed progress as of December 2021)</p> <ul style="list-style-type: none"> <li>150 kV Tayan SS Extension (99.93%) was fully energized in May 2019; the commissioning certificate (SLO) for Line Bay 1 and Line Bay 2 were issued in September 2020 and December respectively,<sup>1</sup> and all pending items were completed in March 2021.</li> <li>150 kV Sanggau SS (97.49%), 1-trafo bay, 2-line bays (Sanggau – Tayan), and 1-</li> </ul>	PT Siemens Indonesia and Siemens Malaysia Bhd (Contractor) supervised by UIP KALBAGBAR (Project Implementation Unit)

<sup>1</sup> Based on *Sertifikat Laik Operasi (SLO)*/Commissioning Certificate from PLN Pusertif

Project Packages	Status	Responsible Party
	<p>couple bay of Sanggau substation energized. The SLO for these items were issued in September and December 2020.<sup>2</sup></p> <ul style="list-style-type: none"> <li>• 150 kV Sekadau SS (99.04%), 1-trafo bay, 4-line bays, and 1-couple bay of Sekadau substation was energized using voltage of 20 kV, with several pending items in progress. Yet, the substation has not been operated due to the incomplete Sanggau- Sekadau TL.</li> </ul>	
<p>Package 6: 150/20 kV Tayan – Sanggau Power Transmission Line</p>	<p><b>Overall progress: 97.92%</b></p> <ul style="list-style-type: none"> <li>• The transmission line has been operated since 16 October 2021.</li> <li>• Construction of retaining walls in 8 out of 9 retaining walls was completed with backfill in several towers are in progress.</li> <li>• Floods in most areas of West Kalimantan had caused road access to be inaccessible.</li> </ul>	<p>PT Krakatau Engineering and PT Citramas Heavy Industries (Contractors) supervised by UIP KALBAGBAR (Project Implementation Unit)</p>
<p>Package 7: 150/20 kV Sanggau – Sekadau Power Transmission Line</p>	<p><b>Under construction (progress: 91.20%)</b></p> <ul style="list-style-type: none"> <li>• Foundation, erection, and stringing of transmission towers.</li> <li>• Several towers and access roads were flooded for about 3 weeks causing delays in construction progress.</li> </ul>	

<sup>2</sup> ibid

## **Chapter 3 Environmental Mitigation Measures and Status**

This chapter elaborates the mitigation measures implemented by the project's activities and its compliance status to the requirements of the EMP for the period of July to December 2021. The mitigation measures of the project's Packages 1 to 4 (i.e., power transmission lines from Bengkayang to Tayan and associated substations) including respective compliance status are reported in sub-chapters 3.1 to 3.4 of this report. In addition, the EMP of the project's Packages 5 to 7 (i.e., power transmission lines from Tayan to Sekadau and associated substations) including respective compliance status are reported in sub-chapters 3.5 to 3.6 of this report.

### 3.1 Package 1: Bengkulu – Jagoibabang Transmission Lines (Operation Phase)

The transmission lines from Bengkulu to Jagoibabang have been in operation since April 2016, and UP3B KALBAR runs its operation. Several towers in Bengkulu - Jagoibabang and Bengkulu - Ngabang - Tayan transmission lines were located in forestry area and have been acquired the permit (IPPKH) on 16 January 2017 by Capital Investment Coordinating Board (Badan Koordinasi Penanaman Modal-BPKM) No. 6/1/IPPKH/PMDN/2017. Up to December 2021, the overall fulfillment progress has achieved 48.50% with implemented action i.e. PNPB and PSDH payment, watershed planting and, empowering community activities as detailed in **Appendix 2.a**.

**Table 3.1** describes the mitigation measures implemented by the project for the operation of the transmission lines, including its compliance status against the mitigation requirements defined in the IEE (2011). Some requirements stipulated in this table are intended for the mitigation of impacts due to substation operation and are not applicable for the transmission lines.

**Table 3.1 Environmental Mitigation Status of Package 1 (Operation Phase)**

No	Potential Impacts / Mitigation Requirements	Mitigation Implemented	Compliance Status / Remarks
<b>1</b>	<b>Electric and Magnetic Fields/EMF (HVTL alignment)</b>		
	Monitor to ensure EMF are within national and international standards/guidelines	The status of EMF monitoring is discussed in the environmental monitoring chapter of this report.	Not applicable.
<b>2</b>	<b>Noise (substation)</b>		
	The mitigation requirements for noise impacts are intended for substation operations, and therefore not applicable for those of the transmission lines reported in this table.		Not applicable.
<b>3</b>	<b>Soil and Water Contamination (substation)</b>		
	The mitigation requirements for soil/water contamination impact are intended for substation operations, and therefore not applicable for those of the transmission lines reported in this table.		Not applicable.
<b>4</b>	<b>Vegetation Management (HVTL alignment, RoW)</b>		
	<ul style="list-style-type: none"> <li>Vegetation removal will only be allowed within the designated width of the RoW and to achieve the required clearances.</li> <li>Tree removal and trimming will only be undertaken by hand tools, including chain saws.</li> </ul>	The vegetation monitoring within the designated width of RoW in the HVTL alignment is conducted by UP3B Kalbar and reported in the weekly ground patrol checklist i.e. in T106 (Sanggau Ledo subdistrict), can be seen in <b>Appendix 2.b</b> .	The mitigation implemented with this regard is compliant with its requirement.



No	Potential Impacts / Mitigation Requirements	Mitigation Implemented	Compliance Status / Remarks
	<ul style="list-style-type: none"> <li>The use of herbicides will be strictly prohibited.</li> </ul>	<p>UP3B Kalbar has developed procedures related to this matter i.e., ROW maintenance procedures no. SMK3/UP3B/IK/22.001 dated on 3 March 2020, in point 5.6, as shown in SAEMR 2 2020.</p>	<p>The mitigation implemented with this regard is compliant with its requirement.</p>
<b>5.</b>	<b>Restriction on Development in RoW (HVTL alignment, RoW)</b>		
	<p>Payment of compensation to affected people during the LARP processes.</p>	<p>Implementation of this mitigation requirement is reported separately in the social monitoring report submitted to ADB.</p>	<p>Not applicable.</p>
<b>6.</b>	<b>Fragmentation of Land Use (HVTL alignment)</b>		
	<p>Siting HVTL alignment is sited so as to avoid, as far as practicable, such fragmentation by following existing roads and boundaries and avoiding cutting across individual land use plots.</p>	<p>The Bengkayang – Jagoibabang transmission lines have been in operation since 2016, and therefore this mitigation requirement is no longer applicable.</p>	<p>Not applicable.</p>
<b>7.</b>	<b>Increased Access (HVTL alignment)</b>		
	<ul style="list-style-type: none"> <li>No permanent access roads to RoW.</li> <li>Any temporary access roads to be decommissioned and restored to natural conditions once construction has been completed.</li> </ul>	<p>The access roads have been naturally overgrown with local vegetation, following the completion of the tower construction, except for the existing road. Several temporary roads were left for community use. It is monitored by UP3B and can be seen in <b>Appendix 2.c.</b></p>	<p>The mitigation implemented with this regard is compliant with its requirement.</p>
<b>8.</b>	<b>Health and Safety (HVTL alignment, substation)</b>		
	<ul style="list-style-type: none"> <li>Operation phase occupational health &amp; safety (OHS) and community health &amp; safety (CHS) plans developed.</li> </ul>	<ul style="list-style-type: none"> <li>The procedures for the operation phase of substation have been established in the OHSMS PLN's West Kalimantan Dispatch Unit (UP3B Kalbar)(No. SMK3/AP2B/U/P/16 dated on 21 June 2017, covering, among others: <ul style="list-style-type: none"> <li>Emergency response procedures;</li> <li>Conductor transfer on tower emergency;</li> <li>Taking unwanted objects on High Voltage and Extra High Voltage Transmission Lines;</li> <li>Handling and storage of hazardous materials</li> </ul> </li> <li>In the UP3B Kalbar's Maintenance Procedure, the</li> </ul>	<p>The mitigation implemented with this regard is compliant with its requirement.</p>

No	Potential Impacts / Mitigation Requirements	Mitigation Implemented	Compliance Status / Remarks
		community health & safety is added to point 5.7 which refer to PERDIR No. 0252.P/DIR/2016 dated on 10 June 2016, about general safety guidelines.	
	<ul style="list-style-type: none"> <li>Towers to be fitted with anti-climbing devices and substations will have security fence and full-time security fence and full-time security personnel on site.</li> </ul>	Each transmission tower has been installed with anti-climbing devices and lock nuts. It is monitored by UP3B and can be seen in <b>Appendix 2.b</b> point 1.4.	The mitigation implemented with this regard is compliant with its corresponding requirements.
	<ul style="list-style-type: none"> <li>Substations to be equipped with fire suppression systems and, as noted above, emergency response plans to be developed.</li> </ul>	These mitigation requirements are intended for substation operations, and therefore do not apply for the operation of transmission lines reported in this table.	Not applicable.
<b>9.</b>	<b>Avian Collisions (HVTL alignment)</b>		
	<ul style="list-style-type: none"> <li>Monitoring will include asking local people and maintenance personnel to report occurrences of dead birds or other dead animals under the line.</li> </ul>	The UP3B supervisor conducted informal interviews with the community around selected locations of transmission towers, and the results suggested that no dead birds and animals were observed. Related evidence of this activity is shown in <b>Appendix 2.d</b> .	The mitigation implemented with this regard is compliant with its requirements.
	<ul style="list-style-type: none"> <li>If a location is to be identified with frequent occurrence, then action will be taken e.g., installing line markers to reduce the incidence.</li> </ul>	Due to the above circumstances, installing the line markers has not been conducted and is considered unnecessary.	Not applicable.

### 3.2 Package 2: Bengkayang Substation (Operation Phase)

The Bengkayang substation has been in operation since December 2015 and UP3B KALBAR is in charge of this operation. **Table 3.2** describes the corresponding mitigation measures implemented by the project including its compliance status against the mitigation requirements defined in the IEE (2011). Some requirements stipulated in this table are intended for the mitigation of impacts due to operation of the transmission lines and are not applicable for the substation.

**Table 3.2 Environmental Mitigation Status of Package 2 (Operation Phase)**

No	Potential Impacts / Mitigation Requirements	Mitigation Implemented	Compliance Status / Remarks
<b>1.</b>	<b>Electric and Magnetic Fields/EMF (HVTL alignment, substation)</b> Monitor to ensure EMF are within national and international standards/guidelines	The status of EMF monitoring is discussed in the environmental monitoring chapter of this report.	Not applicable.
<b>2.</b>	<b>Noise (Substation)</b> High noise operations enclosed in noise-proofed building that effectively contain the noise.	The Bengkayang substation does not generate high noise operations. Further, the substation site is not close to residential areas and schools. The operation of the Ngabang substation does not generate high noise levels. Further, the nearest residential area is about 500 m from the substation. Based on the measurement results in December 2021, the maximum noise measurement results were 66.9dB at the control building and a maximum of 68.8dB at the switchyard location. The noise level value for industrial areas is 70 dB as stated in the Ministry of Environmental and Forestry Regulation No. 48/1996, and the measurement results are still below the standard threshold under the Ministry of Labor Regulations No. 05/2018, the maximum threshold for workers exposure in locations with a continuous noise level of 8 hours is 85dB. The result is presented in <b>Appendix 3.a</b> .	The mitigation implemented with this regard is compliant with its requirement.
<b>3.</b>	<b>Soil and Water Contamination (Substations)</b> <ul style="list-style-type: none"> <li>Transformers and equipment selected will meet international standards and will be routinely maintained.</li> </ul>	<ul style="list-style-type: none"> <li>The transformer and equipment selected for the substation meets the 1999 International Electrical Community (IEC) Standard 60076 1 and 2.</li> </ul>	The mitigation implemented with this regard is compliant with its requirement.



No	Potential Impacts / Mitigation Requirements	Mitigation Implemented	Compliance Status / Remarks
	<ul style="list-style-type: none"> <li>PCB will not be used in transformers and other electrical equipment</li> </ul>	<ul style="list-style-type: none"> <li>The transformer was routinely maintained following the Decree of PLN Director No. 0520-2.K/DIR/2014 on Transformer Maintenance.</li> </ul>	The mitigation implemented with this regard is compliant with its requirement.
	<ul style="list-style-type: none"> <li>Areas around substation transformers and areas where oils, fuels, and hazardous wastes are stored will be encased in an impervious bund capable of holding 150% of those in that area.</li> <li>Discharge from these bunds and other areas with the potential to be oil contaminated will be directed to oil-water separators.</li> <li>Any oil contaminated material will be disposed of at a proper waste disposal approved as required by authorities.</li> <li>An emergency spill response plan will be established, and staff will be trained on spill response procedures.</li> </ul>	<ul style="list-style-type: none"> <li>According to PLN letter No. 0203 Facs./KLIH.01.01/DIV/K3L/2018 (dated on April 30, 2018) on <i>Persyaratan Pengadaan Material/Peralatan (Trafo, Kapasitor, Minyak Trafo) Bebas PCBs</i>, the transformer procurement process owned by PLN must be free from PCB.</li> </ul>	The mitigation implemented with this regard is compliant with its requirements.
<b>4.</b>	<b>Vegetation Management (HVTL alignment, ROW)</b>	<ul style="list-style-type: none"> <li>The 275 kV transformers at Bengkayang substation are equipped with an oil pit structure made of concrete. Construction of the oil pit refers to PLN Standard SPLN T5.009: 2015 (dated on May 13, 2016) - sub-chapter 6.2.3 Fire Control. The oil pit can accommodate approximately 70% of the oil transformer when spilled.</li> <li>During this monitoring period, there was no oil spill from the transformer as presented in <b>Appendix 3.b</b>.</li> <li>The training for operators of the substation related to oil spill response procedures had been conducted in 2019.</li> </ul>	The mitigation implemented with this regard is compliant with its requirements.
	The mitigation requirements defined herein are intended for the operation of transmission lines, and therefore it is not applicable for the operation of substations reported in this table.		Not applicable.
<b>5.</b>	<b>Restriction on Development in RoW (HVTL alignment, ROW)</b>		
	Payment of compensation to affected people during the LARP processes.	Implementation of this mitigation requirement is reported separately in the social monitoring report submitted to ADB.	Not applicable.
<b>6.</b>	<b>Fragmentation of Land Use (HVTL alignment, ROW)</b>		
	The mitigation requirements defined herein are intended for the operation of transmission lines, and therefore not applicable for the operation of substation reported in this table.		Not applicable.

No	Potential Impacts / Mitigation Requirements	Mitigation Implemented	Compliance Status / Remarks
7.	<p><b>Increased Access (HVTL alignment)</b></p> <p>The mitigation requirements defined herein are intended for the operation of transmission lines, and therefore not applicable for the operation of substation reported in this table.</p>		Not applicable.
8.	<p><b>Health and Safety (HVTL alignment, Substations)</b></p> <p>Operation phase occupational health &amp; safety (OHS) and community health &amp; safety (CHS) plans developed.</p>	<ul style="list-style-type: none"> <li>The procedures for the operation phase of substation have been established in the OHSMS PLN's West Kalimantan Dispatch Unit (No. SMK3/AP2B/U/P/16 dated on 21 June 2017), covering, among others: <ul style="list-style-type: none"> <li>Emergency response procedures;</li> <li>Conductor transfer on tower emergency;</li> <li>Taking unwanted objects on High Voltage and Extra High Voltage Transmission Lines;</li> <li>Handling and storage of hazardous materials</li> </ul> </li> <li>In the UP3B Kalbar's Maintenance Procedure, the community health and safety was added to point 5.7 which refer to PERDIR No. 0252.P/DIR/2016 dated on 10 June 2016, about general safety guidelines.</li> </ul>	The mitigation implemented with this regard is compliant with its requirement.
	<ul style="list-style-type: none"> <li>Towers to be fitted with anti-climbing devices and substations will have security fence and full-time security personnel on site.</li> </ul>	The Bengkayang substation has been completed with a security fence and full-time security personnel on site (as shown in <b>Appendix 3.c</b> ).	The mitigation implemented with this regard is compliant with its requirements.
	<ul style="list-style-type: none"> <li>Substations to be equipped with fire suppression systems and emergency response plans.</li> </ul>	Bengkayang Substation has been provided with fire extinguisher and emergency response procedures (as shown in <b>Appendix 3.c</b> ).	The mitigation implemented with this regard is compliant with its requirements.
9.	<p><b>Avian Collisions (HVTL alignments)</b></p> <p>The mitigation requirements for avian collision impact are intended for the operation of transmission lines, and therefore not applicable for the operation of substation reported in this table.</p>		Not applicable.

### 3.3 Package 3: Bengkayang – Ngabang – Tayan Transmission Lines (Operation Phase)

The Bengkayang – Ngabang – Tayan transmission line has been in the operation phase since June 2018 and UP3B KALBAR is in charge of this operation. **Table 3.3** describes the mitigation measures implemented by the project for the operation activity, including its compliance status against the mitigation requirements defined in the IEE (2011). Some requirements stipulated in this table are intended for the mitigation of impacts due to substation operation and are not applicable for the transmission lines.

**Table 3.3 Environmental Mitigation Status of Package 3 (Operation Phase)**

No	Potential Impacts / Mitigation Requirements	Mitigation Implemented	Compliance Status / Remarks
<b>1</b>	<b>Electric and Magnetic Fields/EMF (HVTL alignment)</b>		
	Monitor to ensure EMF are within national and international standards/guidelines	The status of EMF monitoring is discussed in the environmental monitoring chapter of this report.	Not applicable.
<b>2</b>	<b>Noise (substation)</b>		
	The mitigation requirements defined herein are intended for the operation of substation, and therefore not applicable for the operation of transmission line reported in this table.		Not applicable.
<b>3</b>	<b>Soil and Water Contamination (substation)</b>		
	The mitigation requirements defined herein are intended for the operation of substation, and therefore not applicable for the operation of transmission line reported in this table.		Not applicable.
<b>4</b>	<b>Vegetation Management (HVTL alignment, RoW)</b>		
	<ul style="list-style-type: none"> <li>Vegetation removal will only be allowed within the designated width of the RoW and to achieve the required clearances.</li> <li>Tree removal and trimming will only be undertaken by hand tools, including chainsaws.</li> </ul>	The vegetation monitoring within the designated width of RoW in the HVTL alignment is conducted by UP3B Kalbar and reported in the weekly ground patrol checklist i.e. T124 (line Bengkayang - Ngabang) and T22 (line Ngabang - Tayan), can be seen in <b>Appendix 4.a</b>	The mitigation implemented with this regard is compliant with its requirements.
	<ul style="list-style-type: none"> <li>The use of herbicides will be strictly prohibited.</li> </ul>	UP3B Kalbar had already provided the procedures related to this issue in the ROW maintenance procedures no. SMK3/UP3B/IK/22.001 dated on 3 March 2020, in point 5.6, as shown in SAE MR 2 2020.	The mitigation implemented with this regard is compliant with its requirements.

No	Potential Impacts / Mitigation Requirements	Mitigation Implemented	Compliance Status / Remarks
5.	<p><b>Restriction on Development in RoW (HVTL alignment, RoW)</b></p> <p>Payment of compensation to affected people during the LARP processes.</p>	<p>Implementation of this mitigation requirement is reported separately in the social monitoring report.</p>	<p>Not applicable.</p>
6.	<p><b>Fragmentation of Land Use (HVTL alignment)</b></p> <p>Siting HVTL alignment is sited so as to avoid, as far as practicable, such fragmentation by following existing roads and boundaries and avoiding cutting across individual land use plots.</p>	<p>The Bengkayang – Ngabang – Tayan transmission lines have been in operation since June 2018, and therefore this mitigation requirement is no longer applicable.</p>	<p>Not applicable.</p>
7.	<p><b>Increased Access (HVTL alignment)</b></p> <ul style="list-style-type: none"> <li>● No permanent access roads to RoW.</li> <li>● Any temporary access roads to be decommissioned and restored to natural conditions once construction has been completed.</li> </ul>	<p>There was no permanent access road to the RoW of the transmission lines. The temporary access road has been naturally and gradually overgrown with local vegetation following completion of the tower construction as is shown in <b>Appendix 4.b</b>.</p>	<p>The mitigation implemented with this regard is compliant with its requirements.</p>
8.	<p><b>Health and Safety (HVTL alignment, substation)</b></p> <ul style="list-style-type: none"> <li>● Operation phase occupational health &amp; safety (OHS) and community health &amp; safety (CHS) plans developed.</li> </ul>	<ul style="list-style-type: none"> <li>● The procedures for the operation phase of substation have been established in the OHSMS PLN's West Kalimantan Dispatch Unit (No. SMK3/AP2B/U/P/16 dated on 21 June 2017), covering, among others: <ul style="list-style-type: none"> <li>- Emergency response procedures;</li> <li>- Conductor transfer on tower emergency;</li> <li>- Taking unwanted objects on High Voltage and Extra High Voltage Transmission Lines;</li> <li>- Handling and storage of hazardous materials</li> </ul> </li> <li>● In the UP3B Kalbar's Maintenance Procedure, the community health and safety is added to point 5.7 which refer to PERDIR No. 0252.P/DIR/2016 dated on 10 June 2016, about general safety guidelines.</li> </ul>	<p>The mitigation implemented with this regard is compliant with its requirement.</p>
	<ul style="list-style-type: none"> <li>● Towers to be fitted with anti-climbing devices and substations will have security fence and full-time security fence and full-time security personnel on site.</li> </ul>	<p>Each transmission tower has been installed with anti-climbing devices and lock nuts. It is monitored by UP3B and can be seen in <b>Appendix 4.a</b> point 1.4 and 1.14 (T124) and point 1.11 and 1.14 (T22).</p>	<p>The mitigation implemented with this regard is compliant with its corresponding requirements.</p>

No	Potential Impacts / Mitigation Requirements	Mitigation Implemented	Compliance Status / Remarks
	<ul style="list-style-type: none"> <li>Substations to be equipped with fire suppression systems and, as noted above, emergency response plans to be developed.</li> </ul>	<p>These mitigation requirements are intended for substation operations, and therefore do not apply for the operation of transmission lines reported in this table.</p>	<p>Not applicable.</p>
<b>9.</b>	<p><b>Avian Collisions (HVTL alignment)</b></p> <ul style="list-style-type: none"> <li>Monitoring will include asking local people and maintenance personnel to report occurrences of dead birds or other dead animals under the line.</li> </ul>	<p>The UP3B supervisor conducted informal interviews with the community around selected locations of transmission towers, and the results suggested that no dead birds and animals were observed. Related evidence of this activity is shown in <b>Appendix 4.c</b>.</p>	<p>The mitigation implemented with this regard is compliant with its requirements.</p>
	<ul style="list-style-type: none"> <li>If a location is to be identified with frequent occurrence, then action such as installing line markers to reduce the incidence.</li> </ul>	<p>Due to the above circumstances, installing the line markers has not been conducted and is considered unnecessary.</p>	<p>Not applicable.</p>

### 3.4 Package 4: Ngabang and 1<sup>st</sup> Extension of Tayan Substation (Operation Phase)

The Ngabang substation and the 1<sup>st</sup> extension Tayan substation have been in operation since September 2016 and November 2017 respectively and under the responsibility of UP3B KALBAR. **Table 3.4** describes the mitigation measures implemented by the Project for the operation of these substations, including its compliance status against the mitigation requirements defined in the IEE (2011). Some requirements stipulated in this table are intended for the mitigation of impacts due to operation of the transmission lines and are not applicable for the substation.

**Table 3.4 Environmental Mitigation Status of Package 4 (Operation Phase)**

No	Potential Impacts / Mitigation Requirements	Mitigation Implemented	Compliance Status / Remarks
<b>1.</b>	<b>Electric and Magnetic Fields/EMF (HVTL alignment, substation)</b>		
	Monitor to ensure EMF are within national and international standards/guidelines	The status of EMF monitoring is discussed in the environmental monitoring chapter of this report.	Not applicable.
<b>2.</b>	<b>Noise (Substation)</b>		
	High noise operations enclosed in noise-proofed building that effectively contain the noise.	The operation of Ngabang substation does not generate high noise levels. Further, the nearest residential area is about 500 m from the substation. The operation of the Ngabang substation does not generate high noise levels. Further, the nearest residential area is about 500 m from the substation. Based on the measurement results in December 2021, the maximum noise measurement results were 64.5dB at the control building and a maximum of 69.1dB at the switchyard location. The noise level value for industrial areas is 70 dB as stated in the Ministry of Environmental and Forestry Regulation No. 48/1996, and the measurement results are still below the standard threshold under the Ministry of Labor Regulations No. 05/2018, the maximum threshold for workers exposure in locations with a continuous noise level of 8 hours is 85dB. The result is presented in <b>Appendix 5.a.</b>	The mitigation implemented with this regard is compliant with its requirement.
<b>3.</b>	<b>Soil and Water Contamination (Substations)</b>		
	<ul style="list-style-type: none"> <li>Transformers and equipment selected will meet international standards and will be routinely</li> </ul>	The transformer and equipment selected for the substation meets the 1999 International Electrical	The mitigation implemented with this regard is compliant with its

No	Potential Impacts / Mitigation Requirements	Mitigation Implemented	Compliance Status / Remarks
	<p>maintained.</p> <ul style="list-style-type: none"> <li>PCB will not be used in transformers and other electrical equipment.</li> </ul>	<p>Community (IEC) Standard 60076 1 and 2. Further, the transformer is routinely maintained following the Decree of PLN Director No. 0520-2.K/DIR/2014 on Transformer Maintenance.</p> <p>According to PLN letter No. 0203 Facs./KLH.01.01/DIV/K3L/2018 (dated on April 30, 2018) on <i>Persyaratan Pengadaan Material/Peralatan (Trafo, Kapasitor, Minyak Trafo) Bebas PCBs</i>. In the transformer procurement process that owned by PLN must be free from PCB.</p>	<p>requirements.</p> <p>The mitigation implemented with this regard is compliant with its requirement.</p>
	<ul style="list-style-type: none"> <li>Areas around substation transformers and areas where oils, fuels, and hazardous wastes are stored will be encased in an impervious bund capable of holding 150% of oils, fuels, and hazardous wastes in that area.</li> <li>Discharge from these bunds and other areas with the potential to be oil contaminated will be directed to oil-water separators.</li> <li>Any oil contaminated material will be disposed of at a proper waste disposal approved as required by authorities.</li> <li>An emergency spill response plan will be established, and staff will be trained on spill response procedures.</li> </ul>	<ul style="list-style-type: none"> <li>The transformers at Ngabang and Tayan substation (1<sup>st</sup> extension) are equipped with an oil pit structure made of concrete. Construction of the oil pit refers to PLN Standard SPLN T5.009: 2015 (dated on May 13, 2016) - sub-chapter 6.2.3 Fire Control. The oil pit is able to accommodate approx. 110% of oil transformer volume in the event of spill.</li> <li>The availability of oil pits can be seen in <b>Appendix 5.b</b>.</li> <li>There was no oil spill occurred during this monitoring period in Ngabang substation.</li> <li>The training for operators of the substation related to oil spill response procedures had been conducted in 2019.</li> </ul>	<p>The mitigation implemented with this regard is compliant with its requirement.</p>
4.	<b>Vegetation Management (HVTL alignment, ROW)</b>		
	<p>The mitigation requirements defined for vegetation management impact are intended for the operation of transmission lines, and therefore not applicable for the operation of substations reported in this table.</p>		<p>Not applicable.</p>
5.	<b>Restriction on Development in RoW (HVTL alignment, ROW)</b>		
	<p>Payment of compensation to affected people during the LARP processes.</p>	<p>Implementation of this mitigation requirement is reported separately in the social monitoring report submitted to ADB.</p>	<p>Not applicable.</p>



No	Potential Impacts / Mitigation Requirements	Mitigation Implemented	Compliance Status / Remarks
6.	<p><b>Fragmentation of Land Use (HVTL alignment, ROW)</b></p> <p>The mitigation requirements for impact on land use fragmentation are intended for the operation of transmission lines, and therefore not applicable for the operation of substations reported in this table.</p>		Not applicable.
7.	<p><b>Increased Access (HVTL alignment)</b></p> <p>The mitigation requirements for impact on increased land access are intended for the operation of transmission lines, and therefore not applicable for the operation of substations reported in this table.</p>		Not applicable.
8.	<p><b>Health and Safety (HVTL alignment, Substations)</b></p> <ul style="list-style-type: none"> <li>• Operation phase occupational health &amp; safety (OHS) and community health &amp; safety (CHS) plans developed.</li> </ul>	<ul style="list-style-type: none"> <li>• The procedures for the operation phase of substation have been established in the OHSMS PLN's West Kalimantan Dispatch Unit (No. SMK3/AP2B/U/P/16 dated on 21 June 2017), covering, among others: <ul style="list-style-type: none"> <li>- Emergency response procedures;</li> <li>- Conductor transfer on tower emergency;</li> <li>- Taking unwanted objects on High Voltage and Extra High Voltage Transmission Lines;</li> <li>- Handling and storage of hazardous materials</li> </ul> </li> <li>• In the UP3B Kaibar's Maintenance Procedure, the community health and safety is added to point 5.7 which refer to PERDIR No. 0252.P/D/IR/2016 dated on 10 June 2016, about general safety guidelines.</li> </ul>	The mitigation implemented with this regard is compliant with its requirement.
	<ul style="list-style-type: none"> <li>• Towers to be fitted with anti-climbing devices and substations will have security fence and full-time time security personnel on site.</li> </ul>	<p>Ngabang substation has been completed with a security fence and full-time security personnel on site (as shown in <b>Appendix 5.c</b>).</p>	The mitigation implemented with this regard is compliant with its requirement.
	<ul style="list-style-type: none"> <li>• Substations to be equipped with fire suppression systems and emergency response plans.</li> </ul>	<p>The emergency response plan was included in the OHSMS procedure No. SMK3/AP2B/U/IK/10.01 (dated 21 June 2017) on Fire Work Instruction. The Ngabang Substation has been provided with a fire extinguisher (as shown in <b>Appendix 5.c</b>).</p>	The mitigation implemented with this regard is compliant with its requirement.
9.	<p><b>Avian Collisions (HVTL alignments)</b></p> <p>The mitigation requirements for avian collision impact are intended for the operation of transmission lines, and therefore not applicable for the operation of substations reported in this table.</p>		Not applicable.



### 3.5 Package 5: Sanggau and Sekadau Substations (Construction Phase)

The overall progress of Package 5 was 98.362% in December 2021. The 2<sup>nd</sup> extension of Tayan Substation was energized on 27 May 2019 and the remaining pending items were finished in March 2021. Sanggau SS was energized for Trafo Bay and power supply system on 20 December 2019 and Line Bay 1 & 2 also Couple Bay using the voltage of 20 kV on 6 March 2020. Energizing from the 150 kV Tayan - Sanggau Transmission Line was implemented on 16 July 2020, except for Line Bay 2 due to incomplete Sanggau-Sekadau Transmission Line. There are remaining constructions in Sanggau SS i.e. retaining wall, access road, open drainage, cable trench, etc. Sekadau SS. Sekadau SS was energized for Transformer Bay and power supply system on 26 December 2019 and Line Bay 1 & 2 also Couple Bay using the voltage of 20 kV on 4 March 2020. Yet, the substation has not been operated due to the incomplete Sanggau-Sekadau Transmission Line and the pending construction in Sekadau SS is ongoing.

**Table 3.5** describes the mitigation measures implemented for the **construction** activities of Sanggau and Sekadau SS including its compliance status against the mitigation requirements defined in the IEE (2016). The mitigation measures implemented are primarily compliant with the requirements of the corresponding EMP. Few mitigation measures are no longer applicable based on activities associated with the substation construction are nearly complete. **Table 3.6** describes the mitigation measures implemented for the **operational** activities of Tayan and partial of Sanggau SS including its compliance status against the mitigation requirements defined in the IEE (2016). The operational phase for these packages was managed by both UIP KLB and UP3B Kalbar until the rest of the construction was completed and ready to be handed over to UIKL Kalimantan-UP3B Kalbar.

**Table 3.5 Environmental Mitigation Status of Sanggau and Sekadau Substations (Construction Phase)**

No	Potential Impacts / Mitigation Requirements as per IEE (2016)	Mitigation Implemented	Compliance Status / Remarks
1.	<p><b>Vegetation Clearing</b></p> <ul style="list-style-type: none"> <li>Vegetation clearing will be conducted with the combination of cutting trees with hand and chainsaw, while the stump removal will be conducted by bulldozer.</li> <li>Local people will be allowed to access to clear vegetation.</li> <li>Burning of cleared vegetation will not be allowed; instead, this material will be used to protect the steep slope from erosion.</li> <li>The use of herbicides will be strictly prohibited.</li> </ul>	<p>Vegetation clearing at the substation site has been completed, and therefore these mitigation requirements are no longer applicable.</p> <p>The awareness on prohibiting the use of herbicide was delivered by the contractor at the toolbox meeting. The sample toolbox meeting is attached, for Sanggau substation was held on 7 November 2021 and Sekadau substation was held on 1 July 2021. The sign prohibiting the use of herbicide was installed at the fence of the substation. (Relevant evidence is included in <b>Appendix 6.a</b>).</p>	<p>The mitigation implemented is compliant with its requirements.</p>

No	Potential Impacts / Mitigation Requirements as per IEE (2016)	Mitigation Implemented	Compliance Status / Remarks
2.	<b>Soil Erosion</b>		
	<ul style="list-style-type: none"> <li>• Compaction of the soil will be conducted in the embankment areas, and re-vegetated with local grasses, and covered with protecting layers of rice straw or similar material to guard against rapid gully and rill erosion.</li> </ul>	<p>The soil compaction was completed based on the specification of the retaining wall designs approved by PLN Engineering division (dated November 2017) and environmental inspection checklist included in <b>Appendix 6.b</b> of this monitoring report.</p>	<p>The mitigation implemented is compliant with its requirements.</p>
	<ul style="list-style-type: none"> <li>• Construction of slope protection (e.g. retaining wall, gabions etc.) and planting of vegetation strips shrubs and grasses across contours of exposed slopes.</li> </ul>	<ul style="list-style-type: none"> <li>• The construction of slope protection was being undertaken based on the retaining wall designs approved by PLN Engineering division.</li> <li>• The progress of retaining wall construction in Sanggau substation was 97% during this monitoring period.</li> <li>• The retaining wall construction in Sekadau substation was completed in February 2021.</li> </ul>	
	<ul style="list-style-type: none"> <li>• Using the outdoor equipment, gravel over the land will be deployed; the unused open area will be covered with grass and small plants.</li> </ul>	<ul style="list-style-type: none"> <li>• The switchyard area in Sanggau SS was completely graveled on 7 July 2021. The open area will be covered with grass after the road construction is completed.</li> <li>• The gravelling switchyard area in Sekadau substation was completed on 21 June 2021. The unused open area was covered with grass on 20 September 2021. Relevant evidence is included in <b>Appendix 6.b</b>.</li> </ul>	
	<ul style="list-style-type: none"> <li>• The soil erosion control measures will be regularly inspected and maintained during construction and until the area is stabilized or re-vegetated.</li> </ul>	<p>The implementation of soil erosion control measures has been reported in the HSE quarterly report using the environmental inspection checklist included in <b>Appendix 6.b</b>.</p>	

No	Potential Impacts / Mitigation Requirements as per IEE (2016)	Mitigation Implemented	Compliance Status / Remarks
3.	<p><b>Drainage</b></p> <p>Site drainage plans will be developed in accordance with good drainage practices for each substation, including constructing above flood levels and ensuring drainage around the site is provided for high storm flows.</p>	<ul style="list-style-type: none"> <li>The site drainage construction at Tayan substation has been completed.</li> <li>During this monitoring period, the open drainage (outside the switchyard area) in the Sanggau substation and Sekadau substation was completed in August and July 2021 respectively.</li> </ul> <p>Relevant evidence is shown in <b>Appendix 6.c</b>.</p>	<p>The mitigation implemented is compliant with its requirements.</p>
4.	<p><b>Water Quality Impacts</b></p> <ul style="list-style-type: none"> <li>To protect water quality from spillage of oil, fuel and other hazardous materials, good international practices will be adopted.</li> <li>These materials will be stored in designated areas with temporary impermeable bunds in accordance with international standards and at distance of at least 100 m from any water course.</li> <li>Refueling of machinery, equipment and vehicles will be undertaken at distance of at least 100 m from any water course.</li> <li>Oil changing and engine maintenance will be done in designated areas at distance of at least 100 m from any water course with containment to prevent any oil spills washing.</li> <li>Waste oil shall be collected and taken away for recycling.</li> <li>Oil contaminated material shall be disposed at designated waste disposal facilities.</li> <li>Herbicides will not be used in the project.</li> </ul>	<ul style="list-style-type: none"> <li>For spillage of oil around substation transformers, PLN has built an oil catcher based on the drawing approved.</li> <li>Oil pit in hazardous waste temporary shelter (TPS) cannot automatically capture oil spills from transformers. Therefore, PLN plans to build an oil-water separator tank, as required in the IEE 2016 and SPLN No. T4.001:2021 dated 28 June 2021, to directly connect with the potential oil spill from the transformer. The oil-water separator can accommodate at least 30% (<math>\pm 58.5\%</math>) of the largest transformer capacity plus possible water spill inside the tank. The design drawing was finalized on 14 October 2021, and the budget proposal was submitted to DIVMKS on 11 November 2021. Procurement will be conducted after RAB approval, and the construction is targeted to complete in February - March 2022.</li> <li>Refueling of vehicles was conducted at the public fuel station in both Sanggau and Sekadau SS.</li> <li>The heavy equipment (excavator) oil change was not conducted in the Sanggau SS construction site but in the sub-contractor workshop, and no heavy equipment was used in Sekadau SS in this period.</li> <li>As stated in the agreement between UPP KLB 1 and DLH Sanggau, the hazardous waste temporary</li> </ul>	<p>The mitigation implemented is <b>partially compliant</b> with its requirements.</p>

No	Potential Impacts / Mitigation Requirements as per IEE (2016)	Mitigation Implemented	Compliance Status / Remarks
		<p>shelter in Sanggau SS will be constructed after the retaining wall near the 20kV control building construction completes to prevent landslides.</p> <ul style="list-style-type: none"> <li>• Hazardous waste temporary shelter to accommodate waste oil on site had been constructed in Sekadau Substation. The construction was completed on 18 January 2021. The documentation is shown in <b>Appendix 6.d</b>.</li> <li>• The contractor was delivered the herbicide prohibiting use awareness in toolbox meetings in both Sanggau and Sekadau substations. The use of herbicide prohibiting signs has been installed at the fence of the substation. (Relevant evidence is included in <b>Appendix 6. a</b>).</li> </ul>	
<b>5. Air Quality Impacts</b>			
	<ul style="list-style-type: none"> <li>• Spray the dusty soil within substation construction area with water</li> </ul>	<p>During this monitoring report, the dust level is considered low and rainfall tends to be high, therefore the mitigation requirement was not applicable.</p>	Not applicable
	<ul style="list-style-type: none"> <li>• Accumulated soil and debris should be cleaned from adjacent asphalt roads in the entrance of substation.</li> </ul>	<p>No soil and debris accumulated at the asphalt road, and therefore the mitigation requirement was not applicable for the reporting period.</p>	Not applicable
	<ul style="list-style-type: none"> <li>• Truckloads with dusty soil should be covered, except for on-site or local trips.</li> </ul>	<p>During this reporting period, there was no requirement to transport soil from/to Sanggau and Sekadau substations. Therefore, this migration requirement is no longer applicable.</p>	Not applicable.
	<ul style="list-style-type: none"> <li>• Cut and fill should be balanced to the maximum extent possible at each site in order to minimize the need for fill and spoil disposal.</li> </ul>	<p>The cut and fill materials at Sanggau and Sekadau substations have been optimized, and this has eliminated the need for spoil disposal.</p>	The mitigation implemented is compliant with its requirements.
	<ul style="list-style-type: none"> <li>• Construction waste and garbage burning are prohibited.</li> </ul>	<p>The contractor has provided warning signs at the substation site that the burning of cleared vegetation and construction waste is prohibited during this project.</p>	The mitigation implemented is compliant with its requirements.

No	Potential Impacts / Mitigation Requirements as per IEE (2016)	Mitigation Implemented	Compliance Status / Remarks
<b>6. Construction Waste Management</b>			
6.	<ul style="list-style-type: none"> <li>• Solid wastes generated from construction activities should not be haphazardly left around construction sites.</li> <li>• Construction waste will be contained in a designated area on each site (tower site, substation).</li> <li>• Wastes will be routinely collected and disposed at safe waste disposal facilities indicated by the District Environmental agencies</li> <li>• Construction waste burning is prohibited.</li> </ul>	<ul style="list-style-type: none"> <li>• The contractor provided separate trash bins for organic and non-organic wastes at the construction sites. Trash bins that have been full of construction waste were disposed to Sei Kosak waste disposal site, near Sanggau and Sekadau waste disposal site, near Sekadau. (Relevant evidence is included in <b>Appendix 6.e.</b>)</li> <li>• The contractor has provided the warning sign that the burning of waste is prohibited during this project. The awareness about the prohibition of burning vegetation and wastes was delivered by the contractor in the toolbox meeting with samples from Sanggau and Sekadau substations. (Relevant evidence is included in <b>Appendix 6.a.</b>)</li> </ul>	The mitigation implemented is compliant with its requirements.
<b>7. Domestic Waste Management</b>			
7.	<ul style="list-style-type: none"> <li>• Temporary worker camps will be required to be provided with appropriate sanitation facilities, including water supply, and washing facilities, temporary toilets, and waste containers.</li> <li>• Domestic waste will be routinely collected and disposed of at safe waste disposal facilities.</li> <li>• Garbage burning is prohibited.</li> </ul>	The construction worker employed for the Tayan, Sanggau, and Sekadau substations was from the nearby area. Therefore, the mitigation measures defined herein are no longer applicable.	Not applicable.
<b>8. Roads and Infrastructure Impacts</b>			
8.	<ul style="list-style-type: none"> <li>• A mapping of the locations of expected heavy equipment mobilization is needed versus settlement area locations. This is to monitor the potential damage to existing roads.</li> <li>• Any damaged infrastructure after heavy equipment mobilization, will be repaired to at least the same standard and condition on completion of the project.</li> </ul>	In this reporting period, there was no heavy equipment mobilization. Therefore, the mitigation measures defined herein are no longer applicable.	Not applicable.

No	Potential Impacts / Mitigation Requirements as per IEE (2016)	Mitigation Implemented	Compliance Status / Remarks
<b>Encroachment into Protected Forests, Hunting, Wood Collection</b>			
9.	<ul style="list-style-type: none"> <li>• Hunting extraction by workers of forest products such as firewood and keeping of firearms on the project will be prohibited.</li> <li>• To avoid impact on ecological valuable sites, habitats, natural forest, flora and fauna, this risk should be particularly monitored: <ul style="list-style-type: none"> <li>– along the 35-km transmission line between Tayan and Sosok where the alignment passes secondary/production forest reserves; and along the alignment which runs close (3.5 km and 11 km) to the primary forest within <i>Gunung Tiong Kandang</i> and <i>Gunung Sanggau</i>; and</li> <li>– along the alignment which passes close (1.5-km distant) to the primary forests of the 'Pancur Aji' Forest Recreation Reserve.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• The awareness on prohibition of hunting, wood collection, and keeping firearms was delivered by the contractor at the toolbox meeting with samples for Sanggau and Sekadau substations. Relevant evidence on this mitigation is included in <b>Appendix 6.a</b>.</li> <li>• The sites of Tayan, Sanggau, and Sekadau substations are not located in the forest area or close to the sensitive areas mentioned earlier. Nevertheless, the contractor has provided the signs stating that hunting is prohibited in the project areas and also awareness on this matter as described earlier. Relevant evidence on this mitigation can be seen in <b>Appendix 6.f</b>.</li> </ul>	The mitigation implemented is compliant with its requirements.
<b>Impacts on Cultural Heritage Sites</b>			
10.	<p>The Project area falls closely adjacent several notable heritage sites:</p> <ul style="list-style-type: none"> <li>• Although, it is unlikely to suffer impact from Project due to separation distance, Project workers should be made aware that these sites should not be disturbed, or material extracted if visited.</li> <li>• Project construction traffic and heavy equipment should also not be routed anywhere near these sites to avoid vibration damage.</li> </ul> <p>• The transmission line construction should not make impact on important cultural sites, such as community sacred forest (<i>hutan adat</i>) and sacred grave sites. Consultation should be conducted with local traditional leaders (Temengung) for each indigenous ethnic group to identify and avoid any such sites prior to construction.</p>	<p>The contractor already delivered awareness related to cultural heritage during the toolbox meeting with samples for Sanggau and Sekadau substations. The evidence related to this mitigation can be seen in <b>Appendix 6.a</b>.</p>	The mitigation implemented is compliant with its requirements.
		This table reports on the implementation of EMP related to the construction of substations, and therefore the mitigation requirements defined herein are not applicable.	Not applicable.



No	Potential Impacts / Mitigation Requirements as per IEE (2016)	Mitigation Implemented	Compliance Status / Remarks
11.	<p><b>Occupational Health and Safety</b></p> <p>Prior to the commencement of civil works a construction phase Occupational Health and Safety Plan (OHSP) will be developed. The OHSP should:</p> <ul style="list-style-type: none"> <li>● identify and minimize, the causes of potential hazards to workers, including communicable diseases and vector borne diseases;</li> <li>● provide preventive and protective measures, including modification, substitution, or elimination of hazardous conditions, with attention to live power lines, working at height, working during thunderstorms (lightning strikes), EMFs, and exposure to chemicals;</li> <li>● provide measures for the management and appropriate disposal of B3 wastes;</li> <li>● provide the provision of appropriate personal protective equipment (PPE) to minimize risks;</li> <li>● provide training for workers, and establish appropriate incentives to comply with health and safety procedures and utilize PPE;</li> <li>● include procedures for documenting and reporting occupational accidents, diseases, and incidents;</li> <li>● include emergency prevention, preparedness, and response arrangements.</li> </ul>	<ul style="list-style-type: none"> <li>● PT Siemens as the contractor of Package 5 has developed an environmental health &amp; safety (EHS) (covering OHS) plan. This EHS plan has been reviewed and approved by PLN UPP 2 Sintang and PUSMANPRO on 16 October 2018.</li> <li>● The Siemens' EHS plan provides guidance and procedures which are considered adequate for mitigating environmental and OHS risks associated with the construction of 150 kV substations.</li> <li>● PT Siemens has implemented the EHS plan, among others: <ul style="list-style-type: none"> <li>- Providing safety induction to workers on OSH rules and appropriate PPE to workers;</li> <li>- Submitting monthly reports including documenting and reporting occupational accidents, diseases, and incidents;</li> <li>- Establishing emergency response procedures including provision of first-aid kits, fire extinguishers, and emergency call lists; and</li> <li>- Conducting socialization related to current health issues, COVID-19.</li> </ul> </li> <li>● Relevant evidence of this mitigation is included in <b>Appendix 6.g</b>.</li> </ul>	<p>The mitigation implemented is compliant with its requirements.</p>
12.	<p><b>Community Health and Safety</b></p> <p>Prior to the commencement of civil works a construction phase Community Health and Safety Plan (CHSP) will be developed. The CHSP should include:</p> <ul style="list-style-type: none"> <li>● procedures to identify and minimize, the causes of potential project related hazards to local communities, including communicable diseases such as HIV/AIDS and vector borne diseases;</li> <li>● specific emergency response procedures;</li> <li>● relevant emergency equipment;</li> </ul>	<ul style="list-style-type: none"> <li>● PT Siemens has developed community health and safety procedures included in its Community Health, Safety, and Security Management Plan that has been reviewed and approved by PLN UPP 2 Sintang and PUSMANPRO on 4 July 2019.</li> <li>● It explained in the contractor's CHSP the hazards that are likely to occur around the project area and their handling for community safety near the project area.</li> <li>● The socialization related to the CHSP has been</li> </ul>	<p>The mitigation implemented is compliant with its requirements.</p>

No	Potential Impacts / Mitigation Requirements as per IEE (2016)	Mitigation Implemented	Compliance Status / Remarks
	<ul style="list-style-type: none"> <li>• protocols for emergency vehicle services; and</li> <li>• put safety sign.</li> </ul>	<p>conducted by the contractor in the villages near the substations, i.e. Bunut village, Sanggau substation and Mungguk village, Sekadau substation. During this semester, there was no socialization conducted by the contractor.</p> <ul style="list-style-type: none"> <li>• The relevant emergency equipment such as emergency vehicle and safety signs are included in <b>Appendix 6.h</b>.</li> </ul>	
	<ul style="list-style-type: none"> <li>• the settlements in close location from the transmission line should be clearly mapped in order to better inventory and address the EMF (electro-magnetic fields) health &amp; safety risks.</li> <li>• an effective socialization program should follow in this at the mapped locations to address community concerns on the EMF effects of transmission line operation.</li> </ul>	<p>These mitigation requirements are not applicable for the construction of substations reported in this table.</p>	<p>Not applicable.</p>
<b>13.</b>	<b>Employment Opportunities</b>		
	<ul style="list-style-type: none"> <li>• To communicate about employment opportunities on a regular basis and to demonstrate the efforts are made to accommodate as many people as possible.</li> <li>• Be clear about the limited possibility and communicate this limitation during the meetings.</li> <li>• Give priority to impact affected people to participate with the project works e.g. in transmission work the material transportation from roadside to tower site, and other unskilled and semi-skilled labor for either transmission line or substation works.</li> </ul>	<ul style="list-style-type: none"> <li>• The contractor has delivered the message on employment opportunities with the village officials before the construction started.</li> <li>• Local people who have been hired as laborers in the project, such as earthworks and construction work. During this monitoring report, the construction of open drainage in Sekadau substation and pending item work in Sanggau substation are in progress. The employed local worker was 12 people and non-local worker was 9 people with the total of workers on site in November 2021 was 21 people. And in December 2021 the total of local people hired is 31 people.</li> </ul>	<p>The mitigation implemented is compliant with its requirements.</p>
<b>14.</b>	<b>Physical Cultural Resources</b>		
	<p>Awareness to all workers concerning chance find of physical cultural resources during construction implementation:</p> <ul style="list-style-type: none"> <li>• If physical cultural resources are encountered during</li> </ul>	<ul style="list-style-type: none"> <li>• A chance find procedure from PT Siemens has been developed (Ref: page 50 chapter 5.32 about Unexpected Discovery of the EHS plan dated on 16 October 2018. The contractor has conducted the</li> </ul>	<p>The mitigation implemented is compliant with its requirements.</p>



No	Potential Impacts / Mitigation Requirements as per IEE (2016)	Mitigation Implemented	Compliance Status / Remarks
	<p>the construction phase, all works at the find site should be immediately halted.</p> <ul style="list-style-type: none"> <li>• The find should be assessed by a competent expert, and procedures to avoid, minimize or mitigate impacts to the physical cultural resources should be developed by the expert in cooperation with the relevant local heritage authority.</li> <li>• The find should be assessed in consultation with local Traditional Leaders (<i>Temenggung</i>) for each indigenous ethnic group to identify the local cultural significance and obtain guidance on what follow-up actions to be conducted.</li> <li>• Work should not begin until the procedures to avoid, minimize or mitigate impacts to the physical cultural resources have been implemented.</li> <li>• In case avoidance is not feasible and the Project benefits outweigh the anticipated cultural heritage loss from removal, the physical cultural resource should be removed and preserved.</li> <li>• Any removal should be conducted in accordance with relevant national and/or local laws.</li> <li>• Records should be maintained of all finds, including chain of custody for movable finds.</li> <li>• All Project workers and staff should be made aware of the chance-find procedure.</li> </ul>	<p>awareness to the employee during toolbox meeting with sample for Sanggau and Sekadau substations. Relevant documents related to this mitigation are shown earlier in <b>Appendix 6.a</b>.</p> <ul style="list-style-type: none"> <li>• During 2<sup>nd</sup> semester of 2021 reporting period, there were no cultural physical resources found at the substation sites.</li> </ul>	

### 3.6 Package 5: 2<sup>nd</sup> Extension of Tayan and Sanggau Substations (Operation Phase)

**Table 3.6 Environmental Mitigation Status of Phase 2 Tayan Extension and Sanggau Substations (Operation Phase)**

No	Potential Impacts / Mitigation Requirements	Mitigation Implemented	Compliance Status / Remarks
<b>1.</b>	<b>Electric and Magnetic Fields/EMF (substation)</b> All conductors and equipment will be designed and constructed to comply with national and international engineering and maintenance standards/guidelines for Transmission high voltage (SNI 04-6918-2002. Clearance of Transmission High Voltage and SNI 04-6950-203 Threshold value of Magnetic Field of Transmission High Voltage.)	The status of EMF monitoring is discussed in the environmental monitoring chapter of this report.	The mitigation implemented with this regard is compliant with its requirement.
<b>2.</b>	<b>Contamination of Soil and Water (substation)</b> Transformers and equipment selected will meet international standards and will be routinely maintained.	The transformer and equipment selected for the substation meets the 1999 International Electrical Community (IEC) Standard 60076 1 and 2. Further, the transformer is routinely maintained following the Decree of PLN Director No. 0520-2.K/DIR/2014 on Transformer Maintenance.	The mitigation implemented with this regard is compliant with its requirements.
	PCB will not be used in transformers and other electrical equipment.	According to PLN letter No. 0203 Facs./KLH.01.01/DIVK3L/2018 (dated on April 30, 2018) on <i>Persyaratan Pengadaan Material/Peralatan (Trafo, Kapasitor, Minyak Trafo) Bebas PCBs</i> . In the transformer procurement process that owned by PLN must be free from PCB.	The mitigation implemented with this regard is compliant with its requirement.
	<ul style="list-style-type: none"> <li>Areas around substation transformers and areas where oils, fuels, and hazardous wastes are stored will be encased in an impervious bund capable of holding 150% of oils, fuels, and hazardous wastes in that area.</li> <li>Discharge from these bunds and other areas with the potential to be oil contaminated will be directed to oil-water separators.</li> </ul>	<ul style="list-style-type: none"> <li>The construction in Tayan Ext 2 was to add a line bay to distribute towards Sanggau SS, there was no new oil containment added.</li> <li>The training for Tayan substation operators related to oil spill response procedures had been conducted in 2019 and for Sanggau substation will be conducted after handing over to UP3B Kalbar.</li> <li>The availability of oil pits in Sanggau Substation can</li> </ul>	The mitigation implemented with this regard is <b>partially compliant</b> with its requirement.

No	Potential Impacts / Mitigation Requirements	Mitigation Implemented	Compliance Status / Remarks
	<ul style="list-style-type: none"> <li>Any oil contaminated material will be disposed of at a proper waste disposal approved as required by authorities.</li> </ul> <p>An emergency spill response plan will be established, and staff will be trained on spill response procedures.</p>	<p>be seen in <b>Appendix 7.a.</b></p> <ul style="list-style-type: none"> <li>PLN is constructing an oil-water separator as required in IEE following SPLN No. T4.001:2021 dated on 28 June 2021. The oil-water separator capacity can accommodate at least 30% (<math>\pm 58.5\%</math>) of the largest transformer capacity plus possible water spill inside the tank.</li> </ul>	
<b>3.</b>	<b>Vegetation Management (HVTL alignment, RoW)</b>		
	The mitigation requirements defined for vegetation management impact are intended for the operation of transmission lines, and therefore not applicable for the operation of substations reported in this table.		
<b>4.</b>	<b>Restriction on Development in RoW (HVTL alignment, RoW)</b>		
	Payment of compensation to affected people during the LARP processes.	Implementation of this mitigation requirement is reported separately in the social monitoring report submitted to ADB.	Not applicable.
<b>5.</b>	<b>Fragmentation of Land Use (HVTL alignment)</b>		
	The mitigation requirements defined for vegetation management impact are intended for the operation of transmission lines, and therefore not applicable for the operation of substations reported in this table.		
<b>6.</b>	<b>Increased Access (HVTL alignment)</b>		
	The mitigation requirements defined for vegetation management impact are intended for the operation of transmission lines, and therefore not applicable for the operation of substations reported in this table.		
<b>7.</b>	<b>Health and Safety (HVTL alignment, substation)</b>		
	<ul style="list-style-type: none"> <li>Operation phase occupational health &amp; safety (OHS) and community health &amp; safety (CHS) plans developed.</li> </ul>	<ul style="list-style-type: none"> <li>The procedures for the operation phase of substation have been established in the OHSMS PLN's West Kalimantan Dispatch Unit (No. SMK3/AP2B/U/P/16 dated on 21 June 2017), covering, among others: <ul style="list-style-type: none"> <li>Emergency response procedures;</li> <li>Conductor transfer on tower emergency;</li> <li>Taking unwanted objects on High Voltage and Extra High Voltage Transmission Lines;</li> <li>Handling and storage of hazardous materials</li> </ul> </li> </ul>	The mitigation implemented with this regard is compliant with its requirement.

No	Potential Impacts / Mitigation Requirements	Mitigation Implemented	Compliance Status / Remarks
	<ul style="list-style-type: none"> <li>Towers to be fitted with anti-climbing devices and substations will have security fence and full-time security fence and full-time security personnel on site.</li> </ul>	<ul style="list-style-type: none"> <li>In the UP3B Kalbar's Maintenance Procedure, the community health and safety is added to point 5.7 which refer to PERDIR No. 0252.P/DIR/2016 dated on 10 June 2016, about general safety guidelines.</li> </ul>	
<ul style="list-style-type: none"> <li>Towers to be fitted with anti-climbing devices and substations will have security fence and full-time security fence and full-time security personnel on site.</li> </ul>	<ul style="list-style-type: none"> <li>Substations to be equipped with fire suppression systems and, as noted above, emergency response plans to be developed.</li> </ul>	<p>Tayan and Sanggau substation has been completed with security fence and full-time security personnel on site (as shown in <b>Appendix 7.b</b>).</p> <p>The emergency response plan was included in the OHSMS procedure No. SMK3/AP2B/UJK/10.01 (dated 21 June 2017) on Fire Work Instruction. The Tayan Substation has been provided with a fire extinguisher (as shown in <b>Appendix 7.b</b>). However, firefighting equipment in Sanggau Substation has not arrived on site.</p>	<p>The mitigation implemented with this regard is compliant with its requirement.</p> <p>The mitigation implemented with this regard is <b>partially compliant</b> with its requirement.</p>
<p><b>8. Avian Collisions (HVTL alignment)</b></p>	<p>The mitigation requirements defined for vegetation management impact are intended for the operation of transmission lines, and therefore not applicable for the operation of substations reported in this table.</p>		

### 3.7 Packages 6 and 7: Tayan - Sanggau - Sekadau Transmission Lines (Construction Phase)

150 kV Tayan - Sanggau Transmission Line (Package 6) has been fully energized (Line 1 & 2) on 16 October 2020. Construction of 8 towers retaining walls has been completed in November 2021, backfill in several towers are in progress and remaining in 1 tower (T.05R) will also be equipped with a retaining wall. Construction progress reached 97.92% in December 2021. The amendment for BOQ should be issued, therefore the construction of the retaining wall can be included in the progress calculation.

150 kV Sanggau - Sekadau Transmission Line (Package 7) is under construction of foundation work, tower erection and stringing work as the primary activities in Semester 2/2021. The progress reached 91.20% as of December 2021.

**Table 3.7** describes the mitigation measures implemented for the **construction** activities of Package 7 and construction activity of retaining walls in Package 6 including its compliance status against the mitigation requirements defined in the IEE (2016), while **Table 3.8** provides the mitigation measures implemented for the **operational** activities of Package 6. UIP KLB is responsible for the construction phase in both packages. UIP KLB is managing the operational phase for this package. The mitigating item of the operational phase in Package 6 is conducted by both UIP KLB and UP3B Kalbar until the construction is completed and ready to be handed over to UP3B Kalbar.

**Table 3.7 Environmental Mitigation Status of Packages 6 and 7 (Construction Phase)**

No	Potential Impacts / Mitigation Requirements per IEE (2016)	Mitigation Implemented	Compliance Status / Remarks
1.	<p><b>Vegetation Clearing</b></p> <ul style="list-style-type: none"> <li>Vegetation removal will be allowed with the designated width of the ROW and the minimum area required for other infrastructure and activities.</li> <li>Vegetation cutting within the ROW will be undertaken to achieve the required clearances.</li> <li>Tree removal and trimming will only be undertaken by hand tools, including chain saws.</li> <li>Local people will be allowed to access to cleared vegetation for the collection of building materials and firewood.</li> <li>Burning of cleared vegetation will not be allowed; instead this material will be used to protect the soil from erosion, particularly in steeper slope areas, until permanent soil protection measures are in place.</li> </ul>	<ul style="list-style-type: none"> <li>Vegetation cutting within the ROW of the transmission line was conducted to achieve the required clearance of the MEMR Regulation No. 18/2015.</li> <li>In the PT Krakatau Engineering (KE) HSE plan (page 27, chapter 7.22), it is stated that vegetation cutting can only be done manually and using chainsaws. The local people are allowed to collect the remaining vegetation.</li> <li>KE's HSE plan (page 28, chapter 7.22) stated that the use of herbicides is prohibited in the vegetation clearing process. The prohibition of herbicides was also made in the form of warning signs and it was always emphasized to the workers at the toolbox meeting in Package 7 construction site that conducted regularly i.e. on 1 December 2021 in T.72. As for</li> </ul>	<p>The mitigation implemented is compliant with its requirement.</p>

No	Potential Impacts / Mitigation Requirements per IEE (2016)	Mitigation Implemented	Compliance Status / Remarks
	<ul style="list-style-type: none"> <li>The use of herbicides will be strictly prohibited.</li> </ul>	<p>Package 6 the toolbox talk was conducted based on work schedule as in T.60 on 15 November 2021.</p> <ul style="list-style-type: none"> <li>Relevant evidence on the above activities is included in <b>Appendix 8.a.</b></li> </ul>	
<b>2.</b>	<p><b>Soil Erosion</b></p> <ul style="list-style-type: none"> <li>Soil erosion control measures have been incorporated into the engineering design, including the use of adjustable height tower which allow the tower to conform to the slope of the site, thereby reducing land cutting and erosion.</li> </ul>	<ul style="list-style-type: none"> <li>Several locations in Package 6 and 7 requiring adjusting tower height had been constructed to accommodate clearance requirements.</li> <li>Construction of 8 towers retaining walls was completed in November 2021 and backfill in several towers is in progress.</li> <li>The remaining in 1 tower (T.05R) will also be equipped with a retaining wall according to a joint survey on 14 October 2021 and as stipulated in the UPP KLB 1 letter No.0366/TRS.01.03/C40010000/2021 dated 24 December 2021.</li> <li>Relevant evidence on the above activities is included in <b>Appendix 8.b.</b></li> </ul>	<p>The mitigation implemented is compliant with its requirement</p>
	<ul style="list-style-type: none"> <li>In addition, mitigations were, designed in accordance with relevant guidelines and good construction practices adapted to suit the requirements at each site as follows: <ul style="list-style-type: none"> <li><i>On steep slope</i>: minimizing the extent and duration of land disturbance; using sandbags, banks or channels to divert water flows from upslope around the disturbed area; and using vegetation cut or foliage to protect disturbed ground on a temporary basis.</li> <li><i>On dry flat area</i>: using vegetation cut or foliage to protect disturbed ground from rainwater impact on a temporary basis.</li> <li><i>On rice field and wet area</i>: no significant erosion is anticipated.</li> </ul> </li> <li>The soil erosion control measures will be regularly inspected and maintained during construction and until the area is stabilized or re-vegetated.</li> </ul>	<ul style="list-style-type: none"> <li>KE's HSE plan (page 28, chapter 7.22) stated that soil erosion management would be implemented during construction. <ul style="list-style-type: none"> <li><i>On a steep slope</i>: install the embankment before construction begins to prevent erosion; and use vegetation cut or foliage to protect disturbed ground on a temporary basis.</li> <li><i>On dry flat area</i>: using vegetation cut or foliage to protect disturbed ground from rain-water impact on a temporary basis.</li> <li>soil erosion will be monitored regularly during the construction stage until the area is stabilized and re-vegetated.</li> </ul> </li> </ul> <p>Relevant evidence of this mitigation is shown in <b>Appendix 8.b.</b></p>	<p>The mitigation implemented is compliant with its requirement</p>

No	Potential Impacts / Mitigation Requirements per IEE (2016)	Mitigation Implemented	Compliance Status / Remarks
3.	<b>Drainage (substations)</b>		
	The mitigation requirements for drainage are intended for the construction of substations, and therefore not applicable for that of transmission lines reported in this table.		Not applicable.
4.	<b>Water Quality Impacts</b>		
	<ul style="list-style-type: none"> <li>Mitigation measures to protect water quality from erosion are the same as "Vegetation Clearing" and "Soil Clearing", above</li> <li>To protect from impacts on water quality arising from spillage of oil, fuel and other hazardous materials to be taken away by licensed third party.</li> </ul>	<p>The prevention to protect water quality from erosion during vegetation clearing is as described in sub-chapter 3.2, numbers 1 and 2.</p> <ul style="list-style-type: none"> <li>KE's HSE plan (page 29, chapter 7.22) states that fuel, oil, and hazardous materials must be taken away by licensed third parties and managed according to Government Regulation no. 101/2014 as revoked by the new Government Regulation no. 22/2021.</li> <li>The hazardous waste is generated in small quantities and stored in the dedicated temporary storage area, away from watercourses. As of October 2020, the hazardous waste collected during the construction of Packages 6 and 7 was handed over to UPP KBB 2 Sintang by the contractor.</li> <li>Furthermore, Package 6 retaining walls construction started in August 2021 (intermittent), and the hazardous waste generated of used oil residue. It was reused by the workers for their personal use (as motorcycle lubricants). In November 2021, hazardous waste was stored in the contractor's warehouse and recorded in the waste balance.</li> <li>Hazardous waste generated during Package 7 construction has been monitored in the waste balance and facilities owned by the contractor.</li> <li>The hazardous waste of Packages 6 and 7 will be handed over to a licensed 3rd party when the construction process ends.</li> <li>Related evidence of this mitigation is presented in <b>Appendix 8.c.</b></li> </ul>	<p>The mitigation implemented is compliant with its requirement.</p> <p>The mitigation implemented is <b>not compliant</b> with its requirement.</p>



No	Potential Impacts / Mitigation Requirements per IEE (2016)	Mitigation Implemented	Compliance Status / Remarks
	<ul style="list-style-type: none"> <li>Refueling of machinery, equipment and vehicles will be undertaken at distance of at least 100 m from any water course.</li> </ul>	<ul style="list-style-type: none"> <li>Refueling of the construction vehicles was undertaken at the public fuel station. However, refueling the concrete mixer machine was carried out on site and provided with some secondary containment to accommodate spills (as shown in <b>Appendix 8.c</b>).</li> </ul>	The mitigation implemented is compliant with its requirement.
	<ul style="list-style-type: none"> <li>Any major work including oil changing and engine maintenance with the potential for oil to be spilled will be done in designated areas at distance of at least 100 m from any water course with containment to prevent any oil spills washing away.</li> </ul>	<ul style="list-style-type: none"> <li>Any oil changing and engine maintenance were carried out at the off-site workshop, except for the concrete mixer; it was conducted on site similar to refueling (as shown in <b>Appendix 8.c</b>).</li> </ul>	The mitigation implemented is compliant with its requirement.
	<ul style="list-style-type: none"> <li>During the construction of tower sites at rice fields and wet areas, extra measures shall be applied to prevent water contamination by the oil drip or spilled wastewater concrete.</li> </ul>	<ul style="list-style-type: none"> <li>Since there was no construction work located at rice fields and wet areas during this period, therefore this mitigation requirement is not applicable.</li> <li>The nearest distance of the water body to the tower site is 50 m at the crossing tower (T.72). The secondary oil containment was used to prevent oil spill contamination during foundation construction. In September 2021, sandbags were installed to hinder the backfill from eroding (as seen in <b>Appendix 8.b</b>). In October 2021, when the water flow increased and, most of the West Kalimantan area was flooded, this area was also overflowing and, construction work was suspended due to unsafe conditions. The tower erection work is continued with a higher laydown area material to prevent rising water levels.</li> </ul>	Not applicable.
	<ul style="list-style-type: none"> <li>Herbicides will not be used in the project</li> </ul>	In the contractor's HSE plan (page 28, chapter 7.22), it is stated that herbicides are prohibited in vegetation clearing process and mitigation is conducted as described earlier (as shown in <b>Appendix 8.a</b> ).	The mitigation implemented is compliant with its requirement.
<b>5.</b>	<b>Air Quality Impacts</b>		
	<ul style="list-style-type: none"> <li>Truckloads with dusty soil should be covered, except for on-site or local trips.</li> <li>Cut and fill should be balanced to the maximum extent possible at each site in order to minimize the</li> </ul>	<ul style="list-style-type: none"> <li>During the construction of the tower foundation, excavated soil was used as backfill materials for the tower foundation. Therefore, this mitigation requirement is not applicable.</li> </ul>	The mitigation implemented is compliant with its requirement



No	Potential Impacts / Mitigation Requirements per IEE (2016)	Mitigation Implemented	Compliance Status / Remarks
	<ul style="list-style-type: none"> <li>need for fill and for spoil disposal.</li> <li>Construction waste and garbage burning are prohibited.</li> </ul>	<ul style="list-style-type: none"> <li>KE's HSE plan (page 17, chapter 7.8) stated that the waste should not be burned. Further, the prohibition on burning of cleared vegetation and construction wastes was made in the form of warning signs and awareness sessions at the toolbox meeting as described earlier.</li> </ul>	
<b>6.</b>	<p><b>Construction Waste Management</b></p> <ul style="list-style-type: none"> <li>Solid wastes generated from construction activities should not be haphazardly left on site.</li> <li>Construction waste will be contained in a designated area on each construction site.</li> <li>Wastes will be routinely collected and disposed of at safe waste disposal facilities indicated by the District Environmental agencies.</li> </ul>	<p>The contractor has provided a trash bag to collect the garbage contained at each tower construction site and routinely disposed of the waste to Sei Kosak waste disposal site and Sekadau waste disposal site (as shown in <b>Appendix 8.d.</b>)</p>	<p>The mitigation implemented is compliant with its requirement</p>
<b>7.</b>	<p><b>Domestic Waste Management</b></p> <ul style="list-style-type: none"> <li>Temporary worker camps will be required to be provided with appropriate sanitation facilities, including water supply, and washing facilities, temporary toilets, and waste containers.</li> <li>Domestic waste will be routinely collected and disposed of at safe waste disposal facilities.</li> <li>Garbage burning is prohibited.</li> </ul>	<ul style="list-style-type: none"> <li>Workers in Package 6 are local people as shifting workers from Package 7, therefore no camp is required.</li> <li>The contractor of Package 7 rented a house in Bunut Village from the local community people. This house is provided with adequate sanitation facilities. Related evidence is shown in <b>Appendix 8.e</b>;</li> <li>The domestic wastes were managed and disposed of in the same way as the construction wastes.</li> <li>The prohibition on burning of wastes was made in the form of warning signs and reminders at the toolbox meeting.</li> <li></li> </ul>	<p>The mitigation implemented is compliant with its requirement.</p>
<b>8.</b>	<p><b>Roads and Infrastructure Impacts</b></p> <ul style="list-style-type: none"> <li>A mapping of the locations of expected heavy equipment mobilization route is needed versus settlement areas. This needs inventory and monitors the potential damage to existing roads.</li> </ul>	<ul style="list-style-type: none"> <li>The previous existing access road in T60 and T82 (Package 6) was re-leveled to accommodate the material transport process.</li> <li>During this monitoring periode, the damaged road</li> </ul>	<p>The mitigation implemented is compliant with its requirement.</p>

No	Potential Impacts / Mitigation Requirements per IEE (2016)	Mitigation Implemented	Compliance Status / Remarks
	<ul style="list-style-type: none"> <li>Any damaged infrastructure after heavy equipment mobilization (e.g., 150 kV power transformer) will be repaired to at least the same standard and condition</li> </ul>	<p>occurred and was immediately repaired by the contractor, such as road maintenance in T29 (Package 7).</p> <p>Relevance evidence of this mitigation is presented in <b>Appendix 8.f</b>.</p>	
<b>9.</b>	<p><b>Encroachment into Protected Forests, Hunting, Wood Collection</b></p> <ul style="list-style-type: none"> <li>Hunting extraction by workers of forest products such as firewood and keeping of firearms on the project, will be prohibited.</li> <li>To avoid impact on ecological valuable sites, habitats, natural forest, flora and fauna, this risk should be particularly monitored along the ecologically sensitive alignments of the Transmission line: along the 35 km between Tayan and Sosok where the alignment passes close by secondary forest within production forest reserves; along the alignment which runs close (3.5. and 11 km) to the primary forest within Gunung Tiong Kangang and Gunung Sanggau; and along the alignment which passes close (1.5 km distant) to the Pancur Aji Forest Recreation Reserve.</li> </ul>	<ul style="list-style-type: none"> <li>KE's HSE plan (chapter 7.22, page 31) stated that the project work does not interfere with or pass-through areas that have status as protection forests, wildlife reserves, national parks or other ecologically sensitive areas.</li> <li>Although the project site is not located in the forest area, the contractor has provided warning signs that hunting is prohibited at project sites.</li> <li>The awareness about the prohibition of hunting and wood collection was delivered by the contractor at the toolbox meeting (as shown in <b>Appendix 8.a</b>).</li> </ul>	<p>The mitigation implemented is compliant with its requirement.</p>
<b>10.</b>	<p><b>Impacts on Cultural Heritage Sites</b></p> <p>The project area falls closely adjacent several notable heritage sites:</p> <ul style="list-style-type: none"> <li>Although unlikely to suffer impact from project due to separation distance, the project workers should be made aware that these sites should not be disturbed, or material extracted if visited.</li> <li>Project construction traffic and heavy equipment should also not be routed anywhere near these sites to avoid vibration damage.</li> </ul> <p>The project construction should also take care not to make impact on important cultural sites, such as community sacred forest groves (<i>hutan adat</i>) and</p>	<ul style="list-style-type: none"> <li>Contractors have been transported heavy equipment and materials away from cultural heritage sites.</li> <li>Further, awareness related to this mitigation has been delivered during toolbox meetings in Package 7 and Package 6 since the workers are shifting employed from Package 7 (as shown in <b>Appendix 8.a</b>).</li> </ul> <p>The <i>Ngudas</i> ceremony was conducted before cutting trees along the ROW path in the village. During this monitoring period, the cutting of trees along the ROW</p>	<p>The mitigation implemented is compliant with its requirement.</p> <p>Not applicable.</p>

No	Potential Impacts / Mitigation Requirements per IEE (2016)	Mitigation Implemented	Compliance Status / Remarks
	<p>sacred grave sites (<i>tempat keramat</i>).</p> <ul style="list-style-type: none"> <li>Consultation should be conducted with local Traditional Leaders (<i>Teranggung</i>) for each indigenous ethnic group to identify and avoid any such sites prior to construction of all project works.</li> </ul>	<p>was done without Ngudas ceremony because there were no sacred trees and graves found on site.</p> <ul style="list-style-type: none"> <li>Furthermore, on 21 October 2021, the worker, Contractor together with the traditional leader and people around T.29 held <i>syukuran</i> and <i>doa bersama</i> before starting work in T.29 (as shown in <b>Appendix 8.g</b>).</li> </ul>	
<b>11.</b>	<p><b>Occupational Health and Safety (HVTL alignments)</b></p> <p>Prior to the commencement of civil works during construction phase, Occupational Health and Safety Plan (OHSP) will be developed. The OHSP should:</p> <ul style="list-style-type: none"> <li>Identify and minimize so far as reasonably practicable, the causes of potential hazards to workers, including communicable diseases and vector borne diseases;</li> <li>Provide preventive and protective measures, including modification, substitution, or elimination of hazardous conditions, with particular attention to live power lines, working at height, working during thunderstorms (lightning strikes), EMFs, and exposure to chemicals;</li> </ul>	<p>PT KE has developed an environmental health &amp; safety (EHS) plan, covering OHS aspects. The EHS plan has been reviewed and approved by PLN UPP 2 in October 2017, and found to be adequate in terms of providing procedures on:</p> <ul style="list-style-type: none"> <li>Identifying potential hazard for workers is available in HIRAC (Hazard Identification Risk Assessment Control) and JSA (Job Safety Analysis), as seen in <b>Appendix 8.h</b>;</li> <li>Eliminating hazardous condition as defined in the mitigation requirements;</li> <li>Managing disposal of hazardous wastes;</li> <li>Providing personal protective equipment to minimize risk; and</li> <li>Conducting communication and training to establish awareness on site.</li> </ul>	<p>The mitigation implemented is compliant with its requirement.</p>
	<ul style="list-style-type: none"> <li>Provide measures for the management and appropriate disposal of hazardous wastes to ensure protection of the workforce and the prevention and control of releases and accidents;</li> </ul>	<ul style="list-style-type: none"> <li>In PT KE's HSE plan (page 26, chapter 7.21), procedures for the management and appropriate disposal of hazardous wastes are included.</li> <li>The contractor has made a temporary hazardous waste storage area (as shown in <b>Appendix 8.h</b>).</li> </ul>	<p>The mitigation implemented is compliant with its requirement.</p>
	<ul style="list-style-type: none"> <li>Provide appropriate personal protective equipment (PPE) to minimize risks;</li> </ul>	<ul style="list-style-type: none"> <li>In implementation workers have used PPE in accordance with the type of work. When on stringing work, the worker using safety helmet, boots, safety vests and safety gloves and frequently distribute health mask to prevent the covid-19 disease. The</li> </ul>	<p>The mitigation implemented is compliant with its requirement.</p>

No	Potential Impacts / Mitigation Requirements per IEE (2016)	Mitigation Implemented	Compliance Status / Remarks
		documentation is shown in <b>Appendix 8.h</b> .	
	<ul style="list-style-type: none"> <li>Provide training for workers, and establish appropriate incentives to use and comply with health and safety procedures and utilize PPE;</li> </ul>	<ul style="list-style-type: none"> <li>During this period the contractor had informed the workers regarding to covid-19 disease during toolbox meeting. Workers' health is checked periodically. The information sign related to covid-19 disease is provided in worker camp. The documentation shown in <b>Appendix 8.h</b>.</li> </ul>	The mitigation implemented is compliant with its requirement.
	<ul style="list-style-type: none"> <li>Include procedures for documenting and reporting occupational accidents, diseases, and incidents; and</li> </ul>	<ul style="list-style-type: none"> <li>The contractor makes a report related to accidents, disease and incidents, and reports it to the HSE monitoring and conducted monthly.</li> </ul>	The mitigation implemented is compliant with its requirement.
	<ul style="list-style-type: none"> <li>Include emergency prevention, preparedness, and response arrangements in place.</li> </ul>	<ul style="list-style-type: none"> <li>In the contractor's HSE document (page 34, chapter 8) on Emergency Condition, the contractor provided procedure for emergency prevention, preparedness and response arrangements.</li> <li>The contractor has set up the emergency team which is equipped with a first aid kit box, fire extinguisher, evacuation route, safety sign, etc., (as shown in <b>Appendix 8.h</b>).</li> </ul>	The mitigation implemented is compliant with its requirement.
<b>12</b>	<b>Community Health and Safety</b>		
	<p>Prior to the commencement of civil works a construction phase Community Health and Safety Plan (CHSP) will be developed. The CHSP should include:</p> <ul style="list-style-type: none"> <li>Procedures to identify and minimize the causes of potential Project related hazards to local communities, including communicable diseases such as HIV/AIDS and vector borne diseases;</li> <li>Specific emergency response procedures;</li> <li>Relevant emergency equipment;</li> <li>Protocols for emergency vehicle services;</li> <li>Put safety sign;</li> <li>The houses and settlements at close location from the transmission line should be clearly mapped in order to better inventory and address the EMF</li> </ul>	<ul style="list-style-type: none"> <li>PT KE has developed a Community Health, Safety, and Security Management Plan (CHSSMP) that has been reviewed and approved by PLN UPP 2 Sintang and PUSMANPRO on 4 July 2019.</li> <li>First aid kit and fire extinguisher for Package 6 is available in the contractor's emergency vehicles, while in Package 7 is provided on site.</li> <li>The contractor has provided the vehicle for transportation in case of emergency.</li> <li>Safety signs have been installed, to warn the community on the potential risk of entering the project sites, locations that have potential danger.</li> <li>Houses and settlements located close to the transmission lines are being mapped out as the</li> </ul>	The mitigation implemented is compliant with its requirement.

No	Potential Impacts / Mitigation Requirements per IEE (2016)	Mitigation Implemented	Compliance Status / Remarks
	<p>(electro-magnetic fields) health and safety risk; and</p> <ul style="list-style-type: none"> <li>An effective socialization program should be conducted at the mapped locations to address community concerns in regard to the EMF effects of transmission line operation.</li> </ul>	<p>construction progresses.</p> <ul style="list-style-type: none"> <li>PLN has conducted the dissemination regarding the effect of EMF as part of the compensation, land payment, and ROW socialization in each village.</li> </ul> <p>Relevant evidence related to the above description is included in <b>Appendix 8.i</b>.</p>	
<b>13.</b>	<p><b>Employment Opportunities</b></p> <ul style="list-style-type: none"> <li>Communicate about employment opportunities on a regular basis and demonstrate the efforts being made to accommodate as many people as possible.</li> <li>Be clear about the limited possibility and communicate this limitation during the meetings.</li> <li>Give priority to affected people to participate with the project works e.g. in transmission work, to transport the materials from roadside to tower site; other unskilled and semi-skilled available labor either transmission line and/ or substation works.</li> </ul>	<ul style="list-style-type: none"> <li>The workers for Package 6 are decreasing with remaining retaining wall construction. The workers hired for retaining wall construction are the local people from nearby areas with a total 16 people in December 2021.</li> <li>For Package 7, during this semester, most of the works need skilled worker, the number of local workers are decreasing. The local people hired is 86 people and 22 workers hired from outside the project area for December 2021.</li> </ul>	<p>The mitigation implemented is compliant with its requirement</p>
<b>14.</b>	<p><b>Physical Cultural Resources</b></p> <p>Awareness to all workers concerning chance find physical cultural resources during construction implementation:</p> <ul style="list-style-type: none"> <li>If physical cultural resources are encountered during the construction phase, all works at the find site should be immediately halted.</li> <li>The find should be assessed by a competent expert, and procedures to avoid, minimize or mitigate impacts to the physical cultural resources should be developed by the expert in cooperation with the relevant local heritage authority.</li> <li>The find should be assessed in consultation with local Traditional Leaders (<i>Te mungguh</i>) for each indigenous ethnic group to identify the local cultural significance and obtain guidance on what follow-up actions required.</li> </ul>	<ul style="list-style-type: none"> <li>In the KE's HSE plan (page 31, chapter 7.22) there are procedures for finding chances of physical cultural resources. This procedure gives a guidance for someone who works on the project and finds a physical cultural resource, then he has to stop all the activities within the discovery, marks the site area found, secures the site area, prevents the collection of objects by labor or other person, notifies the nearest cultural management agency within 24 hours, submits the object found to local cultural management agency, records all the findings and actions taken.</li> <li>The contractor has conducted the awareness to the employee related physical cultural resources at the toolbox meeting.</li> <li>Further, awareness related to this mitigation has been delivered during toolbox meetings in Package 7 and</li> </ul>	<p>The mitigation implemented is compliant with its requirement</p>

No	Potential Impacts / Mitigation Requirements per IEE (2016)	Mitigation Implemented	Compliance Status / Remarks
	<ul style="list-style-type: none"> <li>• Work should not begin until the procedures to avoid, minimize or mitigate impacts to the physical cultural resources have been implemented.</li> <li>• Where avoidance is not feasible, no alternatives to removal exist, and the Project benefits outweigh the anticipated cultural heritage loss from removal; the physical cultural resource should be removed and preserved accordingly.</li> <li>• Any removal should be conducted in accordance with relevant national and/or local laws.</li> <li>• Records should be maintained of all finds, including chain of custody instructions for movable finds.</li> <li>• All Project workers and staff should be made aware of the chance-find procedure.</li> </ul>	<p>Package 6.</p> <p>The awareness related to this mitigation has been delivered during toolbox meetings in Package 7 ( as shown in <b>Appendix 8.a</b>).</p>	

### 3.8 Package 6 : Tayan – Sanggau Transmission Line (Operation Phase)

**Table 3.8 Environmental Mitigation Status of Package 6 (Operation Phase)**

No	Potential Impacts / Mitigation Requirements	Mitigation Implemented	Compliance Status / Remarks
<b>1.</b>	<b>Electric and Magnetic Fields/EMF (HVTL alignment)</b> All conductors and equipment will be designed and constructed to comply with national and international engineering and maintenance standards/guidelines for Transmission high voltage (SNI 04-6918-2002. Clearance of Transmission High Voltage and SNI 04-6950-203 Threshold value of Magnetic Field of Transmission High Voltage.)	The status of EMF monitoring is discussed in the environmental monitoring chapter of this report.	The mitigation implemented with this regard is in compliant with its requirement.
<b>2.</b>	<b>Contamination of Soil and Water (substation)</b> The mitigation requirements for soil/water contamination impact are intended for substation operations, and therefore not applicable for those of the transmission lines reported in this table.		Not applicable.
<b>3.</b>	<b>Vegetation Management (HVTL alignment, RoW)</b> <ul style="list-style-type: none"> <li>Vegetation removal will only be allowed within the designated width of the RoW;</li> <li>Vegetation cutting within the RoW will be undertaken only to achieve the required clearances;</li> <li>Tree removal and trimming will only be undertaken by hand tools, including chain saws; and</li> </ul> <ul style="list-style-type: none"> <li>The use of herbicides will be strictly prohibited.</li> </ul>	The vegetation monitoring within the designated width of RoW in the HVTL alignment is conducted by UP3B Kalbar and reported in the weekly ground patrol checklist. Related evidence of this activity is shown in <b>Appendix 9.a.</b>  UP3B Kalbar has developed procedures related to this matter i.e., ROW maintenance procedures no. SMK3/UP3B/IK/22.001 dated on 3 March 2020, in point 5.6.	The mitigation implemented with this regard is in compliant with its requirement.



No	Potential Impacts / Mitigation Requirements	Mitigation Implemented	Compliance Status / Remarks
4.	<b>Restriction on Development in RoW (HVTL alignment, RoW)</b> Payment of compensation to affected people during the LARP processes.	Implementation of this mitigation requirement is reported separately in the social monitoring report submitted to ADB.	Not applicable.
5.	<b>Fragmentation of Land Use (HVTL alignment)</b> Siting HVTL alignment is sited so as to avoid, as far as practicable, such fragmentation by following existing roads and boundaries and avoiding cutting across individual land use plots.	The monitoring conducted by UP3B Kalbar on ground patrol had been compliant with ROW maintenance requirements.	Not applicable.
7.	<b>Increased Access (HVTL alignment)</b> <ul style="list-style-type: none"> <li>No permanent access roads to RoW.</li> <li>Any temporary access roads to be decommissioned and restored to natural conditions once construction has been completed.</li> </ul>	The access roads have been naturally overgrown with local vegetation, following the completion of the tower construction (as shown in <b>Appendix 9.b</b> ), except for the existing road. Several temporary roads were left for community use.	The mitigation implemented with this regard is in compliant with its requirement.
6.	<b>Health and Safety (HVTL alignment, substation)</b> <ul style="list-style-type: none"> <li>Operation phase occupational health &amp; safety (OHS) and community health &amp; safety (CHS) plans developed.</li> </ul>	<ul style="list-style-type: none"> <li>The procedures for the operation phase of substation have been established in the OHSMS PLN's West Kalimantan Dispatch Unit (No. SMK3/AP2B/U/P/16 dated on 21 June 2017), covering, among others: <ul style="list-style-type: none"> <li>Emergency response procedures;</li> <li>Conductor transfer on tower emergency;</li> <li>Taking unwanted objects on High Voltage and Extra High Voltage Transmission Lines;</li> <li>Handling and storage of hazardous materials</li> </ul> </li> <li>In the UP3B Kalbar's Maintenance Procedure, the community health &amp; safety is added to point 5.7 which refer to PERDIR No. 0252.P/DIR/2016 dated on 10 June 2016, about general safety guidelines.</li> </ul>	The mitigation implemented with this regard is in compliant with its requirement.
	<ul style="list-style-type: none"> <li>Towers to be fitted with anti-climbing devices and substations will have security fence and full-time security fence and full-time security personnel on site.</li> </ul>	Each transmission tower has been installed with anti-climbing device and lock nut (as shown in <b>Appendix 9.c</b> ).	The mitigation implemented with this regard is compliant with its corresponding requirements.

No	Potential Impacts / Mitigation Requirements	Mitigation Implemented	Compliance Status / Remarks
	<ul style="list-style-type: none"> <li>Substations to be equipped with fire suppression systems and, as noted above, emergency response plans to be developed.</li> </ul>	<p>These mitigation requirements are intended for substation operations, and therefore do not apply for the operation of transmission lines reported in this table.</p>	<p>Not applicable.</p>
7.	<b>Avian Collisions (HVTL alignment)</b>		
	<ul style="list-style-type: none"> <li>Monitoring will include asking local people and maintenance personnel to report occurrences of dead birds or other dead animals under the line.</li> </ul>	<p>The UP3B supervisor conducted informal interviews with the community around selected locations of transmission towers, and the results suggested that no dead birds and animals were observed. Related evidence of this activity is shown in <b>Appendix 9.d.</b></p>	<p>The mitigation implemented with this regard is compliant with its requirements.</p>
	<ul style="list-style-type: none"> <li>If a location is to be identified with frequent occurrence, then action will be taken e.g., installing line markers to reduce the incidence.</li> </ul>	<p>Due to the above circumstances, installing the line markers has not been conducted and is considered unnecessary.</p>	<p>Not applicable.</p>

## **Chapter 4 Environmental Monitoring Status**

The outcomes of the environmental mitigation conducted for the Work Packages 1 to 7 in the period of July – December 2021 were monitored to ensure its effectiveness and compliance with the requirements of the EMP defined in the Project's IEE.

The environmental monitoring requirements of Packages 1 to 4 (i.e., power transmission lines from Bengkayang to Tayan including associated substations) are defined in the IEE (2011). The monitoring implemented including its compliance status is described in sub-chapters 4.1 to 4.4.

The environmental monitoring requirements of Packages 5 to 7 (i.e., power transmission lines from Tayan to Sekadau including associated substations) are defined in the IEE (2016). The monitoring implemented including its compliance status is described in sub-chapters 4.5 to 4.6.

#### 4.1 Package 1: Bengkulu - Jagoibabang Transmission Lines (Operation Phase)

Table 4.1 describes the environmental monitoring conducted for the operation of Bengkulu to Jagoibabang transmission lines including its compliance status against the monitoring requirements defined in the IEE (2011) in the period of July to December 2021.

Table 4.1 Environmental Monitoring Status of Package 1 (Operation Phase)

No	Aspects, Means, and Frequency of Monitoring	Monitoring Implemented	Compliance Status / Remarks
1.	<b>Electrical and Magnetic Fields/EMF (RoW)</b> Monitoring to determine if EMFs generated by the transmission lines are within national and international standards (once every 5 years).	The EMF's first monitoring after the operation had been reported in SAEMR 2 2018. PLN operational unit (UP3B Kalbar) will conduct in the upcoming monitoring with every 5-year interval (due in 2023).	Not applicable
2.	<b>Vegetation Management (RoW)</b> Ensure that vegetation removal mitigations are implemented (monitoring on quarterly basis).	The vegetation monitoring within the designated width of RoW in the HVTL alignment is conducted by UP3B Kalbar and reported in the weekly ground patrol checklist, can be seen earlier in <b>Appendix 2.b</b> .	The monitoring implemented with this regard is compliant with its requirement.
3.	<b>Health and Safety (RoW)</b> <ul style="list-style-type: none"> <li>Ensure operation phase OHS and CHS have been develop and are being implemented (monitoring on quarterly basis).</li> <li>Ensure towers fitted with anti-climbing devices, and substations fitted with security fences (monitoring on quarterly basis).</li> </ul>	<p>The implementation of health and safety included in the ground patrol inspection based on SK DIR No. 0520-1.K/DIR/2014 in the guidelines book for Maintenance of High and Extra High Voltage Transmission Lines (as shown in <b>Appendix 2.b</b>).</p> <p>The monitoring indicated that every transmission tower has been equipped with anti-climbing devices (as shown in <b>Appendix 2.b</b> point 1.4).</p>	<p>The monitoring implemented with this regard is compliant with its requirement.</p> <p>The monitoring implemented with this regard is compliant with its requirement.</p>
4.	<b>Bird Collision (RoW)</b> Monitor bird collision occurrences (monitoring on quarterly basis).	The monitoring through interview and field observations at selected transmission towers/ROW indicated that no death of birds was seen or known <b>Appendix 2.d</b> provides the interview documentation with local people and reports the monitoring.	The monitoring implemented with this regard is compliant with its requirement.

#### 4.2 Package 2: Bengkayang Substation (Operation Phase)

Table 4.2 describes the environmental monitoring conducted for the operation of the Bengkayang substation including its compliance status against the related requirements defined in the IEE (2011) in the period of July to December 2021.

**Table 4.2 Environmental Monitoring Status of Package 2 (Operation Phase)**

No	Aspects, Means, and Frequency of Monitoring	Monitoring Implemented	Compliance Status / Remarks
<b>1. Electrical and Magnetic Fields/ EMF</b>			
	Monitoring to determine if EMFs within national and international standards/guidelines (once every 5 years)	The EMF's first monitoring after the operation had been reported in SAEMR 2 2018. PLN operational unit (UP3B Kalbar) will conduct in the upcoming monitoring with every 5-year interval.	Not applicable
<b>2. Oil, Fuel and Hazardous Materials Management</b>			
	Ensure mitigation measures are in place with respect to oil, fuel and other hazardous materials storage, handling, disposal; and fueling and maintenance of equipment (monitoring on quarterly basis).	<ul style="list-style-type: none"> <li>The monitoring indicated that the OHS management system (locally known as SMK3) of PLN <i>Unit Pelaksana Penyaluran dan Pengaturan Beban (UP3B) Kalimantan</i> was implemented. The OHS monitoring can be seen in <b>Appendix 10.a</b>.</li> <li>The oil pit has been provided underneath the transformer. No oil spills occurred during Semester 2/2021 in Bengkayang substations.</li> </ul>	The monitoring implemented with this regard is compliant with its requirement.
<b>3. Health and Safety (RoW)</b>			
	<ul style="list-style-type: none"> <li>Ensure operation phase OHS and CHS have been develop and are being implemented (monitoring on quarterly basis).</li> <li>Ensure towers fitted with anti-climbing devices, and substations fitted with security fences (monitoring on quarterly basis).</li> </ul>	<p>The monitoring is intended for the operation of the transmission line, and therefore not applicable for that of the substation.</p> <p>The monitoring by UP3B supervisor indicates that the substation has been fitted with a security fence and full-time security personnel. Relevant evidence is included in <b>Appendix 3.c</b>.</p>	<p>Not applicable.</p> <p>The monitoring implemented with this regard is compliant with its requirement.</p>

### 4.3 Package 3: Bengkayang-Ngabang-Tayan Transmission Lines (Operation Phase)

**Table 4.3** describes the environmental monitoring conducted for the operation of Bengkayang – Ngabang – Tayan transmission lines including its compliance status against the monitoring requirements defined in the IEE (2011) in the period of July to December 2021.

**Table 4.3 Environmental Monitoring Status of Package 3 (Operation Phase)**

No	Aspects, Means, and Frequency of Monitoring	Monitoring Implemented	Compliance Status / Remarks
<b>1.</b>	<b>Electrical and Magnetic Fields/EMF</b>		
	Monitoring to determine if EMFs within national and international standards/guidelines (once every 5 years).	The EMF's first monitoring after the operation had been reported in SAEMR 2 2018. PLN operational unit (UP3B Kalbar) will conduct in the upcoming monitoring with every 5-year interval.	Not applicable
<b>2.</b>	<b>Vegetation Management</b>		
	Ensure that vegetation removal mitigations are implemented (monitoring on quarterly basis).	The vegetation monitoring within the designated width of RoW in the HVTL alignment is conducted by UP3B Kalbar and reported in the weekly ground patrol checklist, can be seen earlier in <b>Appendix 4.a</b> .	The mitigation implemented with this regard is compliant with its requirements.
<b>3.</b>	<b>Health and Safety</b>		
	<ul style="list-style-type: none"> <li>Ensure operation phase OHS and CHS have been develop and are being implemented (monitoring on quarterly basis).</li> </ul>	The implementation of health and safety included in the patrol grounding inspection based on SK DIR No. 0520-1.K/DIR/2014 in the guidelines book for Maintenance of High and Extra High Voltage Transmission Lines (as shown in <b>Appendix 4.a</b> ).	The monitoring implemented with this regard is compliant with its requirement.
	<ul style="list-style-type: none"> <li>Ensure towers fitted with anti-climbing devices, and substations fitted with security fences (monitoring on quarterly basis).</li> </ul>	The monitoring indicated that every tower has been equipped with anti-climbing devices. Relevant evidence of this monitoring is shown in <b>Appendix 4.a</b> point 1.4 and 1.14 (T124) and point 1.11 and 1.14 (T22).	The monitoring implemented with this regard is compliant with its requirement.
<b>4.</b>	<b>Bird Collision</b>		
	Monitor bird collision occurrences (monitoring on quarterly basis).	The monitoring of bird collisions has been conducted by the PIC supervisor and obtained the results that no one reported occurrence of death birds within the ROW. <b>Appendix 4.c</b> provides the interview documentation with local people and reports the monitoring.	The monitoring implemented with this regard is compliant with its requirement.

#### 4.4 Package 4: Ngabang Substation and 1st Extension of Tayan Substation (Operation Phase)

Table 4.4 describes the environmental monitoring conducted for the operation of Ngabang substation and 1st extension of Tayan substation, including its compliance status against the mitigation requirements defined in the IEE (2011) in the period of July to December 2021.

**Table 4.4 Environmental Monitoring Status of Package 4 (Operation Phase)**

No	Aspects, Means, and Frequency of Monitoring	Monitoring Implemented	Compliance Status / Remarks
<b>1. Electrical and Magnetic Fields/EMF (RoW)</b>			
	Monitoring to determine if EMFs within national and international standards/guidelines (once every 5 years).	The EMF's first monitoring after the operation had been reported in SAE MR 2 2018. PLN operational unit (UP3B Kalbar) will conduct in the upcoming monitoring with every 5-year interval.	Not applicable
<b>2. Oil, Fuel and Hazardous Materials Management (Substation)</b>			
	Ensure mitigation measures are in place with respect to oil, fuel and other hazardous materials storage, handling, disposal; and fueling and maintenance of equipment.	<ul style="list-style-type: none"> <li>Ngabang Environmental Commission (DLH) has surveyed the location, due to insignificant quantity of hazardous waste; permission related to management waste material in accordance with the requirement of Government Regulation No. 101/2014 on Hazardous and Toxic Waste Management was not required.</li> <li>The monitoring indicates that the OHS management system (locally known as SMK3) of UP3B KALBAR has been implemented. The oil pit has been provided underneath the transformer. No oil spills occurred during Semester 2/2021 in Ngabang substations. The OHS monitoring can be seen in <b>Appendix 10.b</b>.</li> </ul>	The monitoring implemented with this regard is compliant with its requirement.
<b>3. Health and Safety (RoW)</b>			
	<ul style="list-style-type: none"> <li>Ensure operation phase OHS and CHS have been develop and are being implemented.</li> <li>Ensure towers fitted with anti-climbing devices, and substations fitted with security fences.</li> </ul>	<ul style="list-style-type: none"> <li>The monitoring is intended for the operation of the transmission line, and therefore not applicable for the substation.</li> <li>The substation has been fitted with the security fence and guarded by security personnel. Relevant evidence is shown in <b>Appendix 5.c</b>.</li> </ul>	<p>Not applicable.</p> <p>The monitoring implemented with this regard is compliant with its requirement.</p>



#### 4.5 Package 5: Sanggau and Sekadau Substations (Construction Phase)

Up to the end of December 2021, the Tayan (2<sup>nd</sup> extension) and Sanggau substations have been energized. The construction of the Sekadau substation was nearly complete but not yet energized related to Sanggau - Sekadau transmission line completion. The overall progress of Package 5 was 98.362%. **Table 4.5** describes the monitoring activities and results during the construction of partial Sanggau and Sekadau substations. **Table 4.6** describes the monitoring activities during the operation phase for Tayan (Phase 2 extension) and Sanggau substations from July to December 2021.

**Table 4.5 Environmental Monitoring Status of Package 5 (Construction Phase)**

No	Aspect and Means of Monitoring	Monitoring Implemented	Compliance Status / Remarks
<b>1. Vegetation Clearing (RoW)</b>			
	<ul style="list-style-type: none"> <li>Ensure that vegetation removal mitigations are implemented.</li> <li>Monitor effectiveness of vegetation removal control measures.</li> </ul>	This monitoring was intended for the construction of transmission lines, and therefore not applicable for the construction of substation reported herein.	Not applicable.
<b>2. Drainage (Substations)</b>			
	<ul style="list-style-type: none"> <li>Ensure drainage plans are implemented.</li> <li>Monitor effectiveness of drainage system.</li> </ul>	<ul style="list-style-type: none"> <li>The drainage channels at Sanggau and Sekadau substations have been constructed according to the approved drawings.</li> <li>These drainage channels are monitored periodically for removal of weeds, sediments that disrupt water flow. Related evidence is presented in <b>Appendix 10.c</b>.</li> </ul>	The monitoring implemented is compliant with its requirement.
<b>3. Soil Erosion (Tower and Substation Sites)</b>			
	<ul style="list-style-type: none"> <li>Ensure soil erosion control measures are applied.</li> <li>Monitor effectiveness of soil erosion control measures.</li> </ul>	<ul style="list-style-type: none"> <li>The monitoring conducted by the PIC's environmental supervisor at Sanggau substation indicated that erosion prevention has been carried out. Evidence of this monitoring is shown in <b>Appendix 6.b</b>.</li> <li>The temporary sediment trap was no longer used because most of the open area on site was used as road or covered with gravel, particularly for the switchyard.</li> </ul>	The monitoring implemented is compliant with its requirement.

No	Aspect and Means of Monitoring	Monitoring Implemented	Compliance Status / Remarks												
<b>4. Acid Sulphate Soils</b>															
<ul style="list-style-type: none"> <li>Check for presence of potentially acid forming soils at construction site</li> <li>If encountered, ensure mitigations are implemented</li> <li>Monitor effectiveness of acid forming soil mitigation measures</li> </ul>	<p>There was no acid sulphate soils indicated in the substations' location.</p>	<p>Not applicable.</p>													
<b>5. Water Quality (Construction Sites and Storage Areas)</b>															
<ul style="list-style-type: none"> <li>Ensure mitigation measures are in place with respect to oil, fuel and other hazardous materials storage, handling, disposal; and fueling and maintenance of equipment.</li> <li>Monitor effectiveness of mitigation on water quality</li> </ul>	<p>Based on the measurement result of water quality at the Sanggau substation, it was stated that all parameters are still under the threshold for water quality grade 1 of the Government Regulation 22/2021. This monitoring was conducted on 2 December 2021 by the University of Tanjung Pura. The result will be shown in <b>Appendix 10.d</b>.</p>	<p>The monitoring implemented is compliant with its requirement.</p>													
<b>6. Air Quality (Construction Sites and Storage Areas)</b>															
<ul style="list-style-type: none"> <li>Ensure mitigation measures with respect to dust control, truck cleaning, load covering, and soil and spoil pile management are in place.</li> <li>Monitor effectiveness of mitigation on air quality.</li> </ul>	<p>Dust control with spraying water at the construction site of the substation was monitored and reported periodically. During this monitoring report, the dust level is considered low and rainfall tends to be high, therefore the mitigation requirement was not applicable.</p>	<p>The monitoring implemented is compliant with its requirement.</p>													
<ul style="list-style-type: none"> <li>Monitor effectiveness of mitigation on air quality.</li> </ul>	<p>The ambient air quality monitoring was conducted on 2 December 2021 at Sanggau substation by the University of Tanjung Pura. The monitoring result below indicates that all air quality parameters are below the threshold values of ambient air quality standards stipulated in Government Regulation No. 22/2021.</p> <table border="1" data-bbox="1227 590 1404 1224"> <thead> <tr> <th>Parameter</th> <th>Unit</th> <th>Result</th> <th>Threshold value</th> </tr> </thead> <tbody> <tr> <td>Dust</td> <td>µg/Nm<sup>3</sup></td> <td>3.45</td> <td>230</td> </tr> <tr> <td>Nitrogen Oxide (NO<sub>x</sub>)</td> <td>µg/Nm<sup>3</sup></td> <td>2.27</td> <td>200</td> </tr> </tbody> </table>	Parameter	Unit	Result	Threshold value	Dust	µg/Nm <sup>3</sup>	3.45	230	Nitrogen Oxide (NO <sub>x</sub> )	µg/Nm <sup>3</sup>	2.27	200	<p>The monitoring implemented is compliant with its requirement.</p>	
Parameter	Unit	Result	Threshold value												
Dust	µg/Nm <sup>3</sup>	3.45	230												
Nitrogen Oxide (NO <sub>x</sub> )	µg/Nm <sup>3</sup>	2.27	200												

No	Aspect and Means of Monitoring	Monitoring Implemented	Compliance Status / Remarks																												
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7.		<p><b>Waste Management (Construction Sites and Worker Camps)</b></p> <ul style="list-style-type: none"> <li>Ensure construction and domestic waste management collection, storage and disposal mitigations are in place and effective.</li> </ul>	<p>The monitoring implemented is compliant with its requirement.</p>																												

No	Aspect and Means of Monitoring	Monitoring Implemented	Compliance Status / Remarks
8.	<p><b>Roads and Infrastructure (Construction Sites, Access Roads, Relevant District Roads)</b></p> <ul style="list-style-type: none"> <li>Ensure mitigation measures are in place with respect to road and infrastructure damage by heavy equipment transport (monthly during construction).</li> <li>Ensure any damage is documented and repaired.</li> <li>Monitor effectiveness of mitigation on road and infrastructure</li> </ul>	<p><b>Roads and Infrastructure (Construction Sites, Access Roads, Relevant District Roads)</b></p> <p>During this monitoring period, there was no heavy equipment mobilization. Therefore, this monitoring requirement is not applicable.</p>	Not applicable.
9.	<p><b>Encroachment (Gunung Condong in West Kalimantan, Areas adjacent to RoW)</b></p> <ul style="list-style-type: none"> <li>Ensure mitigation measures are in place with respect to no hunting or wildlife collection, plant or timber collection, or lighting of fires, or possession of firearms, traps or snares, by workers.</li> <li>Monitor effectiveness of mitigation on encroachment impact.</li> </ul>	<p><b>Encroachment (Gunung Condong in West Kalimantan, Areas adjacent to RoW)</b></p> <p>The monitoring that was conducted in the construction area during the working hours, indicated that no hunting, wildlife collection or other encroachment incidents were known or reported for this reporting period (as shown in <b>Appendix 10.f</b>).</p>	The monitoring implemented is compliant with its requirement.
10.	<p><b>Occupational and Community Health and Safety (Construction Sites and Worker Camps)</b></p> <ul style="list-style-type: none"> <li>Ensure mitigation measures in place with respect to construction phase OHS and CHS plans are being implemented.</li> <li>Monitor effectiveness of mitigation on Occupational and Community Health and Safety.</li> </ul>	<p><b>Occupational and Community Health and Safety (Construction Sites and Worker Camps)</b></p> <p>The OHS for the construction of substations have been implemented as reported in Sub-chapter 3.1 of this report. The contractor has conducted socialization for workers and local people related to this subject. The mitigation of OHS and CHS has been effectively implemented as indicated with no OHS incidents reported during this reporting period.</p>	The monitoring implemented is compliant with its requirement.
11.	<p><b>Employment Opportunities</b></p> <ul style="list-style-type: none"> <li>Ensure mitigation measures are in place with respect to employment opportunity</li> <li>Monitor effectiveness of employment opportunities</li> </ul>	<p><b>Employment Opportunities</b></p> <ul style="list-style-type: none"> <li>Monitoring indicated that the contractor has delivered the message on employment opportunities with the local (village) government. The employed workers were reported monthly by the contractor.</li> <li>The worker for remaining works in Sanggau and Sekadau substation is hired from the local people by contractor.</li> </ul>	The monitoring implemented is compliant with its requirement.

No	Aspect and Means of Monitoring	Monitoring Implemented	Compliance Status / Remarks
12.	<b>Physical Cultural Resources (Construction Sites)</b> <ul style="list-style-type: none"> <li>• Ensure mitigation measures are in place with respect to implementation of chance-finding physical cultural resources awareness and applied if required.</li> <li>• Monitor effectiveness of mitigation on physical cultural resources.</li> </ul>	<ul style="list-style-type: none"> <li>• Monitoring indicated that procedures on the chance-find of physical cultural resources are put in place.</li> <li>• There were no findings on physical cultural resources reported during this reporting period.</li> </ul>	The monitoring implemented is compliant with its requirement.

#### 4.6 Package 5: 2<sup>nd</sup> Extension of Tayan and Sanggau Substations (Operation Phase)

Table 4.6 Environmental Monitoring Status of Package 5 (Operation Phase)

No	Aspects, Means, and Frequency of Monitoring	Monitoring Implemented	Compliance Status / Remarks
<b>1.</b>	<b>Electrical and Magnetic Fields/EMF (RoW)</b> Monitoring to determine if EMFs within national and international standards/guidelines (first 2 years conducted every year and then once every 5 years).	Based on IEE 2016, the EMF will be conducted once every year during the first 2 year. The sampling has been conducted on 2 December 2021 by the University of Tanjung Pura as shown in <b>Appendix 10.g</b> .	The monitoring implemented is compliant with its requirement.
<b>2.</b>	<b>Oil, Fuel and Hazardous Materials Management (Substation)</b> Ensure mitigation measures are in place with respect to oil, fuel and other hazardous materials storage, handling, disposal; and fueling and maintenance of equipment.	<ul style="list-style-type: none"> <li>The monitoring indicates that the OHS management system (locally known as SMK3) of UP3B KALBAR has been implemented. The oil pit has been provided underneath the transformer and no oil spills occurred during Semester 2/2021 in Sanggau substations.</li> <li>Sanggau Environmental Commission (DLH) has surveyed the location and reached agreement with UPP KLB 1 that the hazardous waste temporary shelter in Sanggau SS will be constructed after the retaining wall near the 20kV control building construction completes to prevent landslides (as shown earlier in <b>Appendix 6.d</b>).</li> </ul>	The monitoring implemented with this regard is compliant with its requirement.
<b>3.</b>	<b>Health and Safety (RoW)</b>		
	<ul style="list-style-type: none"> <li>Ensure operation phase OHS and CHS have been develop and are being implemented.</li> </ul>	<ul style="list-style-type: none"> <li>The monitoring is intended for the operation of the transmission line, therefore not applicable for the substation.</li> </ul>	Not applicable.
	<ul style="list-style-type: none"> <li>Ensure towers fitted with anti-climbing devices, and substations fitted with security fences.</li> </ul>	<ul style="list-style-type: none"> <li>The substation has been fitted with the security fence and guarded by security personnel. Relevant evidence is shown earlier in <b>Appendix 5.b</b>.</li> </ul>	The monitoring implemented with this regard is compliant with its requirement.

#### 4.7 Packages 6 and 7: Tayan-Sanggau and Sanggau-Sekadau Transmission Lines (Construction Phase)

**Table 4.7** describes the monitoring activities and results for the **construction** activities of Package 7 and construction activity of retaining walls in Package 6 including its compliance status against the mitigation requirements defined in the IEE (2016), while **Table 4.8** provides the monitoring activities and results for the **operational** activities of Package 6. UIP KLB is responsible for the construction phase in both packages. UIP KLB is managing the operational phase for this package. The mitigating item of the operational phase in Package 6 is conducted by both UIP KLB and UP3B Kalbar until the construction is completed and ready to be handed over to UP3B Kalbar. The environmental monitoring conducted on a monthly basis is primarily compliant with the requirements of corresponding EMP, and the results indicate that the measures implemented are quite effective in minimizing environmental impacts.

**Table 4.7 Environmental Monitoring Status of Packages 6 and 7 (Construction Phase)**

No	Aspect and Means of Monitoring	Monitoring Implemented	Compliance Status / Remarks
1.	<b>Vegetation Clearing (RoW)</b>		
	<ul style="list-style-type: none"> <li>Ensure that vegetation removal mitigations are implemented.</li> <li>Monitor effectiveness of vegetation removal control measures.</li> </ul>	The mitigation measures related to vegetation removal control/cutting using hand tools has been well-implemented by the contractor. Related evidence is shown in <b>Appendix 10.h</b> .	The monitoring implemented is compliant with its requirement.
2.	<b>Drainage (Substations)</b>		
		The monitoring requirement defined under this subject is intended for the construction of substation, and therefore it is not applicable for that of transmission lines reported herein.	Not applicable.
3.	<b>Soil Erosion (Tower and Substation Sites)</b>		
	<ul style="list-style-type: none"> <li>Ensure soil erosion control measures are applied.</li> <li>Monitor effectiveness of soil erosion control measures.</li> </ul>	The implementation of mitigation measures related to soil erosion control has been implemented. In September 2021, sandbags were installed to hinder the backfill from eroding. In October 2021, when the water flow increased and most of the West Kalimantan area was flooded, this area was also overflowing and construction work was suspended due to unsafe conditions. The tower erection work is continued with a higher material laydown area to prevent it from rising water level. It is monitored periodically by Pusmanpro. Related evidence is shown earlier in <b>Appendix 8.b</b> .	The monitoring implemented is compliant with its requirement.



No	Aspect and Means of Monitoring	Monitoring Implemented	Compliance Status / Remarks
4.	<p><b>Acid Sulphate Soils</b></p> <ul style="list-style-type: none"> <li>Check for presence of potentially acid forming soils at construction site</li> <li>If encountered, ensure mitigations are implemented</li> <li>Monitor effectiveness of acid forming soil mitigation measures</li> </ul>	<p>According to Letter (KLH) No. S.87/PPKL/PKG/PKL-O/3/2020, several location in Package 6 and 7 indicated located in acid forming soil, during construction, several action had been taken to minimize disturbance such as minimize excavation period to re-closure as shown in SAEMR 1 2021. Currently all the towers in the peat land area have finished construction with the last tower foundation in the peatland area completed in September 2019.</p>	<p>The monitoring implemented is compliant with its requirement.</p>
5.	<p><b>Water Quality (Construction Sites and Storage Areas)</b></p> <ul style="list-style-type: none"> <li>Ensure mitigation measures are in place with respect to oil, fuel and other hazardous materials storage, handling, disposal; and fueling and maintenance of equipment.</li> <li>Monitor effectiveness of mitigation on water quality</li> </ul>	<ul style="list-style-type: none"> <li>The hazardous waste generated during Package 7 construction and Package 6 construction (in November 2021) is monitored in the waste balance and facilities owned by the contractor.</li> <li>The hazardous waste of Packages 6 and 7 will be handed over to a licensed 3rd party when the construction process ends.</li> </ul> <p>Related evidence is shown earlier in <b>Appendix 8.c.</b></p>	<p>The monitoring implemented is <b>partially compliant</b> with its requirement.</p>
6.	<p><b>Air Quality (Construction Sites and Storage Areas)</b></p> <ul style="list-style-type: none"> <li>Ensure mitigation measures with respect to dust control, truck cleaning, load covering, and soil and spoil pile management are in place.</li> <li>Monitor effectiveness of mitigation on air quality.</li> </ul>	<p>Most mitigation measures were not applicable for the construction of transmission lines, because the excavated soil was used as a backfill fill material to cover the tower foundation when construction was completed.</p> <ul style="list-style-type: none"> <li>The ambient air quality monitoring was conducted in collaboration with the University of Tanjung Pura at Sanggau District for Package 6 in W1 December 2021. The monitoring result indicates that all air quality parameters are below the ambient air quality standards threshold stipulated in Government Regulation No. 22/2021. The monitoring was held in resettlement area Sei Mawang village and tower T.185.</li> </ul>	<p>The monitoring implemented is compliant with its requirement.</p>

No	Aspect and Means of Monitoring	Monitoring Implemented				Compliance Status / Remarks																																																				
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No	Aspect and Means of Monitoring	Monitoring Implemented	Compliance Status / Remarks
7.	<p><b>Waste Management (Construction Sites and Worker Camps)</b></p> <ul style="list-style-type: none"> <li>Ensure construction and domestic waste management collection, storage and disposal mitigations are in place.</li> <li>Monitor effectiveness of mitigation on waste management.</li> </ul>	<p>The monitoring identified that the construction sites have been provided with trash bags to collect the wastes. The wastes collected are disposed regularly to the final disposal site operated by Sekadau Regency. Relevant evidence of the monitoring described are shown in <b>Appendix 8.d and 8.e.</b></p>	<p>The monitoring implemented is compliant with its requirement.</p>
8.	<p><b>Roads and Infrastructure (Construction Sites, Access Roads, Relevant District Roads)</b></p> <ul style="list-style-type: none"> <li>Ensure mitigation measures are in place with respect to road and infrastructure damage by heavy equipment transport.</li> <li>Ensure any damage is documented and repaired.</li> <li>Monitor effectiveness of mitigation on road and infrastructure.</li> </ul>	<ul style="list-style-type: none"> <li>The monitoring indicated that road damage occurred and the contractor has repaired the road damage immediately, as shown in <b>Appendix 8.f.</b></li> <li>The monitoring indicated there was no complaint filed by the community.</li> </ul>	<p>The monitoring implemented is compliant with its requirement.</p>
9.	<p><b>Encroachment (Gunung Condong in West Kalimantan, Areas adjacent to RoW)</b></p> <ul style="list-style-type: none"> <li>Ensure mitigation measures are in place with respect to no hunting or wildlife collection, plant or timber collection, or lighting of fires, or possession of firearms, traps or snares, by workers.</li> <li>Monitor effectiveness of mitigation on Encroachment impact.</li> </ul>	<ul style="list-style-type: none"> <li>The monitoring indicated that the project site to date was not located in the forest area.</li> <li>The contractor has provided the warning sign that hunting is prohibited during this project to avoid impact on ecological valuable sites.</li> <li>The awareness about the prohibition of hunting and wood collection was delivered by the contractor in the toolbox meeting, as shown in <b>Appendix 8.a.</b></li> </ul>	<p>The monitoring implemented is compliant with its requirement.</p>
10.	<p><b>Occupational and Community Health and Safety (Construction Sites and Worker Camps)</b></p> <ul style="list-style-type: none"> <li>Ensure mitigation measures are in place with respect to construction phase and OHS and CHS have been developed and are being implemented.</li> </ul>	<ul style="list-style-type: none"> <li>The monitoring results showed that the OHS plans have been developed and well implemented in the construction phase. The use of PPE was monitored before the work started.</li> <li>According to the contractor HSE report, the total number of workers hired is 84 people in December 2021. There was no accident, based on the related report shown in <b>Appendix</b></li> </ul>	<p>The monitoring implemented is compliant with its requirement.</p>

No	Aspect and Means of Monitoring	Monitoring Implemented	Compliance Status / Remarks
		<p><b>10. j.</b></p> <ul style="list-style-type: none"> <li>The contractor provided the Community Health Safety and Security Management Plan to cover the CHS procedure. The relevant evidence related to the above description can be seen in <b>Appendix 8.h and 8.i.</b></li> </ul>	
	<ul style="list-style-type: none"> <li>Monitor effectiveness of mitigation on Occupational and Community Health and Safety.</li> </ul>	<p>The mitigation of OHS has been effectively implemented as evidenced there is no accident reported during this monitoring period.</p>	<p>The monitoring implemented is compliant with its requirement.</p>
<b>11.</b>	<b>Employment Opportunities</b>	<ul style="list-style-type: none"> <li>The contractor has delivered the message on employment opportunities with the local (village) government and provided the monthly report of their worker.</li> <li>The number of workers of Package 6 is decreasing because the construction work is almost complete, remaining on the retaining wall. The worker hired for retaining wall construction is comes from local communities.</li> <li>During this semester, Package 7 requires skilled workers for erection and stringing towers, thus most of the workers are non-local. For the tower foundation work, the local people were hired by the contractor.</li> </ul>	<p>The monitoring implemented is compliant with its requirement.</p>
<b>12.</b>	<b>Physical Cultural Resources (Construction Sites)</b>	<ul style="list-style-type: none"> <li>Monitoring indicated that the chance-find procedures on the cultural resources are in place and the construction workforce have been informed on this matter during the toolbox meeting (as shown in <b>Appendix 8.a</b>).</li> <li>There were no physical cultural resources found in this reporting period.</li> </ul>	<p>The monitoring implemented is compliant with its requirement.</p>

#### 4.8 Packages 6 : Tayan-Sanggau Transmission Line (Operation Phase)

Table 4.8 Environmental Monitoring Status of Packages 6 (Operation phase)

No	Aspects, Means, and Frequency of Monitoring	Monitoring Implemented	Compliance Status / Remarks
<b>1.</b>	<b>Electrical and Magnetic Fields/EMF</b>		
	Monitoring to determine if EMFs within national and international standards/guidelines (once every 5 years).	Based on IEE 2016, the EMF will be conducted once every year during the first 2 year, conducted on 2 December 2021 by the University of Tanjung Pura as shown in <b>Appendix 10.k</b> .	The monitoring implemented with this regard is compliant with its requirement.
<b>2.</b>	<b>Vegetation Management</b>		
	Ensure that vegetation removal mitigations are implemented. Monitor effectiveness of vegetation management (monitoring on quarterly basis).	No vegetation removal was conducted as reported in the ground patrol monitoring provided by UP3B Kalbar.	The monitoring implemented with this regard is compliant with its requirement.
<b>3.</b>	<b>Health and Safety</b>		
	<ul style="list-style-type: none"> <li>Ensure operation phase OHS and CHS have been develop and are being implemented</li> </ul>	The implementation of health and safety included in the patrol grounding inspection based on SK DIR No. 0520-1.K/DIR/2014 in the guidelines book for Maintenance of High and Extra High Voltage Transmission Lines.	The monitoring implemented with this regard is compliant with its requirement.
	<ul style="list-style-type: none"> <li>Ensure towers fitted with anti-climbing devices, and substations fitted with security fences</li> <li>Monitor effectiveness of implementation OSH and CHS (monitoring on quarterly basis).</li> </ul>	The monitoring indicated that every tower has been equipped with anti-climbing devices. Relevant evidence of this monitoring is shown earlier in <b>Appendix 9.c</b>	The monitoring implemented with this regard is compliant with its requirement.
<b>4.</b>	<b>Bird Collision</b>		
	Monitor bird collision occurrences Monitor effectiveness of bird collision (monitoring on quarterly basis).	The monitoring of bird collisions has been conducted by UP3B Kalbar and obtained the results that no one reported occurrence of death birds within the ROW. <b>Appendix 9.d</b> provides the interview documentation with local people and reports the monitoring.	The monitoring implemented with this regard is compliant with its requirement.

## Chapter 5 Findings on EMP Implementation and Corrective Actions

As elaborated in Chapters 3 and 4 of this monitoring report, both PLN and its contractors have put their efforts to implement corrective actions identified in the previous monitoring report and comply with the environmental mitigation and monitoring requirements defined in the project's EMP. **Table 5.1** provides an update of the status of identified corrective actions as of the end of December 2021. In Package 3, some of the corrective action considered unresolved since 2018 related to the contractor's responsibility for the IEE implementation during construction. There had been outstanding issues up to the end of the construction phase which was completed in 2018.

**Table 5.1 Findings on EMP Implementation and Corrective Actions**

No	Aspects / Findings	Corrective Actions and Responsible Party	Status (as of end December 2021)
<b>Package 3: Bengkayang-Ngabang-Tayan Transmission Lines (Operation Phase)</b>			
1.	<b>Vegetation Removal (HVTL alignment)</b>		
	There is no formal documentation indicating that the Project does not use herbicides for pest management.	Develop a related document e.g. instruction prohibiting the project to use herbicides; and report the monitoring of this in the site inspection record, minutes of meeting or other documents as appropriate. The responsible party was KEC International Ltd (remain outstanding since Q2/2018)	Until the construction had been finished, the contractor has not closed this issue. <b>Therefore, this aspect is considered unresolved from the previous semesters.</b>
2.	<b>Acid sulphate soils (HVTL alignment)</b>		
	There was no formal documentation, procedures or awareness on mitigation requirements related to the potential acid sulphate soils in the project areas.	Conduct awareness to workers regarding the potential presence of acid sulphate soil at the construction site and provide management directions if this type of soil is encountered. Evidence can be delivered in the form of MoM meetings, attendance list and handout of capacity building. The responsible party was PLN UIP Kalbagbar and KEC International Ltd (remain outstanding since Q1/2018)	Until the construction had been finished, the contractor has not closed this issue. <b>Therefore, this aspect is considered unresolved from the previous semesters.</b>
3.	<b>Encroachment into Protected Forest, Hunting and Wood Collection</b>		
	There was no sign or procedure to all workers about the prohibition to accessing forest and forest products, including maintaining firearms on the Project areas	Develop the required instruction and communicate it through safety or minutes of meeting as appropriate. The responsible party was PLN UIP Kalbagbar and KEC International Ltd (remain	Until the construction had been finished, the contractor has not closed this issue. <b>Therefore, this aspect is considered unresolved from the previous semesters.</b>

No	Aspects / Findings	Corrective Actions and Responsible Party	Status (as of end December 2021)
		outstanding since Q2/2018)	
4.	<b>Occupational Health and Safety</b>		
	EHS plan did not provide identification and minimization of potential hazards to worker, including corresponding preventive and protective measures.	Develop a related procedure or other documents as appropriate and consistently enforce the implementation of the procedures and increase its supervision. The responsible party was KEC International Ltd (remain outstanding since Q2/2018)	Until the construction had been finished, the contractor has not closed this issue. <b>Therefore, this aspect is considered unresolved from the previous semesters.</b>
5.	<b>Community Health and Safety</b>		
	There was no procedure for interaction with local and regional emergency and health authorities in EHSP document.	Contractor submitted procedures for interaction with local and regional emergency and health authorities in EHSP document. The responsible party was KEC International Ltd (remain outstanding since Q2/2018)	Until the construction had been finished, the contractor has not closed this issue. <b>Therefore, this aspect is considered unresolved from the previous semesters.</b>
6.	<b>Physical Cultural Resources</b>		
	The chance to find procedures to identify and manage physical cultural resources in the project area has not been developed.	Develop a chance find procedure considering the requirements of the Project's IEE (2011). The responsible party was PLN UIP Kalbagbar and KEC International Ltd (remain outstanding since Q2/2018)	Until the construction had been finished, the contractor has not closed this issue. <b>Therefore, this aspect is considered unresolved from the previous semesters.</b>
<b>Package 5: Tayan (Phase 2 Extension) and Sanggau and Sekadau Substation</b>			
1	Site drainage plans will be developed in accordance with good drainage practices for each substation, including constructing above flood levels and ensuring drainage around the site is provided for high storm flows.	Site drainage plans will be developed in accordance with good drainage practices for each substation.	<b>Completed</b> - The drainage construction was completed in August 2021 for Sanggau SS and in July 2021 for Sekadau SS.
<b>Package 6 and 7: Tayan – Sanggau and Sanggau – Sekadau Transmission Line</b>			
1	The hazardous waste generated in small quantities and stored in the dedicated temporary storage area, away from any water courses. By the end of October 2020, the hazardous waste collected during the construction of Package 6 and Package 7 were handed over to UPP KBB 2 Sintang by the	<ul style="list-style-type: none"> <li>Package 6 retaining walls construction was started in August 2021 (intermittent), and the hazardous waste was generated of used oil residue. It was reused by the workers for personal use (motorcycle chain lubricants). Since November 2021, hazardous waste has</li> </ul>	<b>Pending</b> – The hazardous waste of Packages 6 and 7 will be handed over to a licensed 3rd party when the construction process ends.



No	Aspects / Findings	Corrective Actions and Responsible Party	Status (as of end December 2021)
	<p>contractor. During this monitoring period, the oil changing was carried out in workshops along with machinery maintenance and since the S1/2021 monitoring period the waste oil on site has been collected by the local worker for their personal use.</p>	<p>been stored in the contractor's warehouse and recorded in the waste balance.</p> <ul style="list-style-type: none"> <li>● Hazardous waste generated during Package 7 construction is monitored in the waste balance and facilities owned by the contractor.</li> </ul>	

## Chapter 6 Status of Corrective Actions Identified at ADB Evaluation Meeting

The last field review Mission of the project was conducted by ADB and PLN in October 2019. Due to global COVID-19 pandemic, several virtual meetings between these two parties have been conducted in 2021 to evaluate the progress of remaining construction works of Packages 5 to 7, including its environmental safeguard status. **Table 6.1** presents an update (as of December 2021) of the action items in response to the findings identified at the October 2019 Mission. The corrective actions that have been completed and reported in the former SAEMR are no longer presented in the following table.

**Table 6.1 Status of Action Items (as of December 2021)**

No	Findings	Responsible Party	Corrective Action (and status)
<b>Items Identified at the October 2019 Mission</b>			
<b>Sanggau and Sekadau Substations and Phase II Extension of Tayan Substation (Package 5)</b>			
1	<b>Sanggau and Sekadau substation</b> - construct the oil containment (bund wall) facility and associated oil-water separator as required by IEE. The same issue was identified during previous ADB mission.	UIP KLB	<b>Pending</b> – Oil pit in Hazardous waste temporary shelter (TPS) cannot automatically capture oil spill from transformer. Therefore, PLN plans to build an oil-water separator tank, as required in the IEE and SPLN, to be directly connected with potential oil spill from the transformer. The design drawing was finalized as required in the SPLN T4.001:2021 on 14 October 2021 and RAB was submitted to DIVMKS on 28 October 2021. Contractor procurement will be conducted after approval is achieved and construction is targeted to be completed in February - March 2022. The design drawing of the oil-water separator can be seen in <b>Appendix 11.a</b> .
<b>Items Identified at the May 2020</b>			
<b>Semi-annual Environmental Monitoring Report</b>			
2	Action items that are identified as pending, partially complete or not yet undertaken as of S2/2018 and S1/2019 reports should be reported in subsequent environmental monitoring reports.	UIP KLB	<b>Ongoing</b> - from S2/2019 monitoring report onwards

## Chapter 7 Conclusions and Recommendations

**Conclusion.** The 2<sup>nd</sup> Semester/2021 environmental monitoring report describes the environmental mitigation and monitoring conducted by the PLN in the West Kalimantan Power Grid Strengthening Project for the period of July to December 2021 and evaluates its compliance against the Initial Environmental Examination (IEE) documents of 2011 and 2016.

During the construction phase in Package 3 (2013 – 2018) some of the IEE 2011 requirements have not been implemented by the contractor. This finding is considered unresolved because Package 3 has been in the operation phase since June 2018.

Related PLN units i.e., UIP KALBAGBAR (in charge of the construction of packages 5 to 7) and UP3B KALBAR (in charge of the operation of packages 1 to 4) have been primarily implementing the environmental mitigation and monitoring, and therefore considered compliant with the requirements of IEE.

For most sections of Packages 5 and 6 that have been energized, PLN has carried out monitoring for the operation phase, under the obligation of the PLN UIP KLB before handed over to the UIKL Kalimantan - UP3B Kalbar.

**Recommendation.** The contractors shall maintain their performance in presenting monthly reports submitted to PLN, including: complete and accurate data of the mitigation items in accordance with the requirements mentioned in the IEE 2016 documents completely; and complete evidence of the implementation of mitigation measures in the form of photos, supporting documents as well as relevant drawing. The mitigation plans that remains partially compliant or not compliant with IEE 2016 construction requirement needs to be solved soon to maintain the performance. The UP3B Kalbar shall conduct the system operation in accordance with the procedures and have to implement the environment monitoring as stated in the IEE 2011 and IEE 2016.