

New Planting Procedure - Summary of Integrated Management Plan



Roundtable on Sustainable Palm Oil



Bumitama Agri Ltd.



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NPP Reference Number

RSPO New Planting Procedure (NPP) 2021

Country of the NPP submission:

Indonesia

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Reference to the management unit management plan

- Integrated HCV-HCS Assessment of PT Karya Makmur Langgeng by Aksenta, satisfactory by February 2023
- Social and Environmental Impact Assessment Document (AMDAL) of PT Karya Makmur Langgeng, approved by the relevant government agency
- The latest update of Social Impact Assessment of PT Karya Makmur Langgeng by Ecotrop

Name(s) of estate(s) covered under this management plan:

PT Karya Makmur Langgeng

1. EIA

Table 1. Management & Monitoring Plan of EIA

No.	Impact	Benchmark Impact	Location	Environmental Management		Environmental Monitoring	
				Plan	Period	Indicators & Method	Period
I	PRE CONSTRUCTION PHASE						
	Attitude and Community Perceptions	<ul style="list-style-type: none"> - The emergence of negative or positive attitude and perceptions from community to plan activities - The existence of complaints, protests, or lawsuits and negotiation delays because of the involvement of third party, consumptive use of money and the existence of vulnerability to crime - The existence of price deals for the local community land acquisition 	<ul style="list-style-type: none"> - Village of Semandang Kanan and Kampar Sebomban, Sub-district of Simpang Dua - Village of Paoh Concong, Sub-district of Simpang Hulu 	<ul style="list-style-type: none"> - Socialization and transparency to community regarding company plan to build Palm Oil Mill and Oil Palm Plantation - Receiving advice, aspirations, and expectations from community - Strengthen relationships and communication with community - Engaging relevant agencies in socialization, boundary demarcation and land acquisition - Forming a counseling team consisting of community leaders / traditional leaders / religious leaders 	At preconstruction phase and during the project (if necessary)	<ul style="list-style-type: none"> - Interviews and questionnaires regarding community attitudes and perception, social restlessness, and the mindset of community, either positive or negative 	Yearly at pre-construction phase
II	CONSTRUCTION PHASE						
2.1.	Improvement of employment opportunities and business, attitude, and community perceptions	<ul style="list-style-type: none"> - Increasing the labor force and business opportunities for community especially to local community that directly affected, which can be known from periodically research regarding per capita income, living cost, and local revenue 	<ul style="list-style-type: none"> - Village of Semandang Kanan and Kampar Sebomban, Sub-district of Simpang Dua - Village of Paoh Concong, Sub-district of Simpang Hulu 	<ul style="list-style-type: none"> - Providing opportunities for local communities who are directly affected by oil palm plantation activities, to work as an employee in accordance with qualification - Providing training, business guidance and business capital to community who are directly affected, regarding new business opportunity outside the agricultural sector 	Once at the construction phase or continuously adjusted to the needs of labor during ongoing operations	<ul style="list-style-type: none"> - Interviews and questionnaires regarding opportunities of employment and business that can be utilized by the local community 	Once every 6 months

		<ul style="list-style-type: none"> - The emergence of economic infrastructure and productive activities - Group or the proportion of local communities who work in the company - The occurrence of change in mindset and behavior in community, there are recruitment of manpower 		<ul style="list-style-type: none"> - Participating in providing and complementing economic infrastructure - Involving local communities in plasma programs - Giving information regarding employment opportunities in a transparent way - Participating directly in youth activities, arts, and sports, by increasing the facilities and infrastructure that support the activities - Providing media / means to complaints which come from the local communities - Providing social assistance, in the form of public facilities, religious facilities, and improving rural infrastructure - Creating a forum for discussion with the local communities and holding useful counseling for society 			
2.2	Decreasing air quality and increasing noise	<ul style="list-style-type: none"> - Government Regulation no. 41 of 1999 regarding Controlling Air Pollution and Emission - Decree of the Minister of Environment Number: KEP-48/MENLH /11 /1996, regarding Noise Level Threshold 	<ul style="list-style-type: none"> - Village of Semandang Kanan and Kampar Sebomban, Sub-district of Simpang Dua - Village of Paoh Concong, Sub-district of Simpang Hulu 	<ul style="list-style-type: none"> - Selecting systems, methods and technologies of mobilization, land clearing, and construction of facilities and infrastructure which are expected to be able to reduce dust levels - Adjusting the vehicle speed at the location of the project area - Doing water spraying before the physical working to prevent the spreading of dust particles 	Immediately or maximum two (2) months after mobilization activities	<ul style="list-style-type: none"> - Measurements and laboratory analysis of air quality and compared to PP. 41 of year 1999 - Measurements of Noise Level and compared to Decree of the Minister of Environment Number: KEP-48/MENLH/11/1996 	Periodically every 6 months during construction activities, especially on the roads used to mobilization near the local community's settlement, land clearing and construction of facilities.
2.3.	Decreasing level of public health	Clean and healthy lifestyle in community, number of patients, the number of	<ul style="list-style-type: none"> - Village of Semandang Kanan and Kampar Sebomban, Sub- 	<ul style="list-style-type: none"> - Helping increase the frequency of health care for local communities that are affected by water borne diseases and air borne diseases 	- Education/ Counseling regarding health and environmental	- Analyse data of number and type of disease suffered by community due to construction activities	Every 6 months during construction activities

		accidents and the level of health care	district of Simpang Dua - Village of Paoh Concong, Sub-district of Simpang Hulu	<ul style="list-style-type: none"> - Developing/improving health facilities and increasing the number of medic/paramedi - Providing free health care for local communities who are underprivileged - Providing counseling regarding clean and healthy lifestyle - Coordinate with the clinic / local health center 	<p>sanitation which will be conducted twice a year</p> <ul style="list-style-type: none"> - Periodic medical checks will be conducted twice a year, or if there is complaint from employee and community regarding health problems 	- Secondary data related with health problems	
2.4.	Decreasing quality of surface water	<ul style="list-style-type: none"> - There is no decreasing quality of river water based on Government Regulation No. 82 of 2001, regarding Management of Water Quality and Water Pollution Control - There is no complaint from local communities who use the river water - There is no disease caused by the decreasing quality of river water (waterborne diseases) 	<ul style="list-style-type: none"> - Semandang River - Semandang Rivulet - Communities in the study area or communities who are directly affected by the activities of oil palm plantations 	<ul style="list-style-type: none"> - Maintaining green belt area (greenbelt) along the riparian and perform soil and water conservation - Planting land cover crop that can quickly grow on the banks of steep slope - Make sedimentation hole along the road 	<ul style="list-style-type: none"> - Twice a year during construction activities - or if there is reporting or complaint from communities which are using the river 	<ul style="list-style-type: none"> - Taking sample of river water and doing scientific/laboratory analysis - Measuring the percentage of open land 	Once every 6 months
2.5.	Forest and land fires	Increasing of open land and the occurrence of forest and land fires, especially on dry season	<ul style="list-style-type: none"> - Village of Semandang Kanan and Kampar Sebomban, Sub-district of Simpang Dua - Village of Paoh Concong, Sub-district of Simpang Hulu 	<ul style="list-style-type: none"> - Conducting information dissemination about forest and land fires - Procuring of facilities and infrastructure for forest and land fires prevention and control in quantities that can be adjusted to the area's hectarage - Making sign boards of fire hazard and make a ban of burning. - Building guard posts and doing patrol activities 	Once at every beginning of the dry season (between June until August).	<ul style="list-style-type: none"> - The number of land fires due to company activities and recording of fire management - Inventory of firefighting facilities and infrastructure - Analysis of the number of training that has been done 	Every 6 months during construction activities

				<ul style="list-style-type: none"> - Establishing firefighting team of forest and land at corporate and community levels - Providing training and counseling to handle forest and land fires to employee and community by cooperating with relevant agencies 			
2.6.	Attitude and community perceptions	Mindset and behavior changes in community around the study areal due to the land clearing	<ul style="list-style-type: none"> - Village of Semandang Kanan and Kampar Sebomban, Sub-district of Simpang Dua - Village of Paoh Concong, Sub-district of Simpang Hulu 	<ul style="list-style-type: none"> - Providing media / means to facilitate and accommodate the restlessness and complaints which coming from the local community - Creating a discussion forum with the community and holding useful counseling for society - Making procedures for communication between communities and companies and socializing to the community 	<ul style="list-style-type: none"> - One time in the first year of oil palm operational - Review and update once every 2 years 	<ul style="list-style-type: none"> - Interviews and questionnaires regarding communication procedures between communities and companies. 	<ul style="list-style-type: none"> - Once during construction activities - Review and update once every 2 years
2.7.	Decline of water biodiversity	Decreased levels of species diversity and number of aquatic biota	<ul style="list-style-type: none"> - River(s) at and around oprational area 	<ul style="list-style-type: none"> - Making sign boards that contain ban to take / find fish by exploitation of a destructive nature / dangerous for ecosystem balance - Creating wildlife posters - Providing training to employees regarding wildlife awareness 	At the same period as land clearing	<ul style="list-style-type: none"> - Secondary data regarding installation document of sign board - Training document 	Once every 6 months
III	OPERATIONAL PHASE						
3.1.	Decreasing air quality and increasing noise	Government Regulation no. 41 of 1999 regarding Controlling Air Pollution and Emission	<ul style="list-style-type: none"> - Village of Semandang Kanan and Kampar Sebomban, Sub-district of Simpang Dua - Village of Paoh Concong, Sub-district of Simpang Hulu 	<ul style="list-style-type: none"> - Selecting the systems, methods and technologies of FFB, CPO, and kernel transportations and POM, which are expected to be able to reduce dust levels below the threshold - Providing free medical treatment to people who suffer from diseases caused by climate changes as ARI (ISPA), diarrhea and others 	Immediately or a maximum of two (2) months after the factory construction and waste water treatment plan (WWTP)	<ul style="list-style-type: none"> - Measurements and laboratory analysis of air quality and compared to PP. 41 of 1999 - Measurements of Noise Level and compared to Decree of the Minister of Environment Number: KEP-48/MENLH/11/1996 	<ul style="list-style-type: none"> - Emissions: at emission sources (POM, Genset), once every 6 months - Air quality: at settlements which are passed by operational activities, once every 6 months - Noise level: at noise sources and settlements, once every 3 months

3.2	Increasing employment opportunities and business opportunities, which will also increase people's income	<ul style="list-style-type: none"> - Increasing capital income, living cost, and local revenue - Implementation of systems of remuneration issued by the government (Regional Minimum Wages), and other allowance in accordance with company financial capability - Group or proportion of community that is receiving extra income 	<ul style="list-style-type: none"> - Village of Semandang Kanan and Kampar Sebomban, Sub-district of Simpang Dua - Village of Paoh Concong, Sub-district of Simpang Hulu 	<ul style="list-style-type: none"> - Providing opportunities for local community who are directly affected by oil palm plantation activities, to work as an employee in accordance with qualification and labor requirements - Providing training, business guidance and business capital to community who are directly affected, regarding new business opportunity outside the agricultural sector - Using local labor maximally and using local businessman - Providing counseling and training regarding entrepreneurship management to community - Participating in providing and complementing economy infrastructure - Giving information to community leaders (formal and informal) regarding required employment opportunities 	Once at the operational phase or continuously adjusted to the project activity	<ul style="list-style-type: none"> - Interviews and questionnaires regarding income, new economic activities, company benefit to the community, proportion of community who get benefit from the company 	Once every year
3.3	The reduced level of public health	Clean and healthy lifestyle in community, number of patients, and the level of health servicing	<ul style="list-style-type: none"> - Emplacement of oil palm plantation and mill - Community settlements around the plantation 	<ul style="list-style-type: none"> - Helping increase the frequency of health care to communities that are affected by water borne diseases and air borne diseases - Developing/improving health facilities and increasing the number of medic/paramedics - Providing free health care to local communities who are underprivileged - Allocating funding for free health care - Providing counseling regarding clean and healthy lifestyle - Coordinating with clinic/local health center 	<ul style="list-style-type: none"> - Providing counseling regarding health and environmental sanitation periodically, twice every year - Medical checks periodically, twice every year or if there is complaint from employee and community regarding health problems 	<ul style="list-style-type: none"> - Secondary data: report of management activities - Survey and interview regarding health issues 	Once every 6 months

3.4	Community's attitude and perceptions regarding social restlessness	<ul style="list-style-type: none"> - There is no restlessness or polemics that develop in community on waste management activities - The existence of complaints, protests, or lawsuits and negotiation delays because of the involvement of third party, consumptive use of money and the existence of vulnerability to crime 	<ul style="list-style-type: none"> - Village of Semandang Kanan and Kampar Sebomban, Sub-district of Simpang Dua - Village of Paoh Concong, Sub-district of Simpang Hulu 	<ul style="list-style-type: none"> - Doing transfer of knowledge and technology to community especially regarding the community empowerment programmes - Doing socialization (focus group discussion) to group of communities regarding community empowerment programmes which will be implemented by the company - Performing approach using participatory methods (Participatory Rural Appraisal) - Performing proactive approach to community leaders and people through transparent socialization about the company planning - Facilitating and accommodating the wishes and expectations of communities that are affected by company activities - Involving society organizations located in study area - Participating directly in youth activities, arts and sport, by increasing the facilities and infrastructure that support the activities 	Periodically, once every 6 months	<ul style="list-style-type: none"> - Interviews and questionnaires regarding community's attitudes and perception to company 	Once per year
IV.	POST OPERATIONAL PHASE						
4.1	Decreasing community income	<ul style="list-style-type: none"> - Decreasing per capita income, level of community consumerism, living cost, and local revenue 	<ul style="list-style-type: none"> - Village of Semandang Kanan and Kampar Sebomban, Sub-district of Simpang Dua - Village of Paoh Concong, Sub-district of Simpang Hulu 	<ul style="list-style-type: none"> - Providing training, business guidance and business capital to community who are directly affected, regarding new business opportunity outside the agricultural sector - Giving information clearly regarding labor dismissals accordance to employment contract - Providing counseling and training regarding entrepreneurship management to community 	Once at the post-operational phase or continuously adjusted to the project activity	<ul style="list-style-type: none"> - Interviews, questionnaires, and analysis related to income and the number of trainings that are given during the post operational phase 	Once at the post-operational phase or continuously adjusted to the project activity

				- Involving local communities in monitoring and managing the implementation of the project in the post-operational phase.			
4.2.	Community's attitude and perceptions	<ul style="list-style-type: none"> - The occurrence of mindset and behaviour changes in community around areal study due to labor dismissals - The existence of complaints, protests, or lawsuits and negotiation delays because the involvement of third party, consumptive use of money and the existence of vulnerability to crime 	<ul style="list-style-type: none"> - Village of Semandang Kanan and Kampar Sebomban, Sub-district of Simpang Dua - Village of Paoh Concong, Sub-district of Simpang Hulu 	<ul style="list-style-type: none"> - Providing debriefing of entrepreneurship training - Performing approach using participatory methods (Participatory Rural Appraisal) - Giving information clearly regarding labor dismissals according to employment contract - Providing severance pay and reward money for the labor's services to the company, in reasonably and according to laws 	Conducted at the end of the post-operational phase activities and at the expiration of the operational activities	- Interviews, questionnaires, and analysis related of income and the number of trainings that are given during the post operational	Conducted at the end of the post-operational phase activities and at the expiration of the operational activities

2. SIA

Table 2. Management Plan of Social Impact

Social Impact	Management Plan	Monitoring Plan	Activities	Timeframe	Stakeholder engagement
Increasing job opportunity to the community around PT KML	Carrying out employee recruitment transparently and prioritizing hiring from the local community	Monitoring the quantity of local employee hiring	Providing information related to job vacancies and recruitment process especially to villages around the company	During the company's operation, adjust to the operational and worker needs of the company	<ul style="list-style-type: none"> - Local government at village level - Plasma cooperative (partnership) - Traditional Institutions - Local government at sub-district level
	Continuing the recruitment of local people as the company's labor according to the expertise they have	Monitoring employee Key Performance Indicator (KPI) achievements	Coordinating with HC and BCU Dept to monitor the capacity building of employees		

Increasing productivity and land economic value	Continuing the development of sustainable plantations followed by an agreed partnership scheme (plasma)	Monitoring the potential of community land that can be developed into oil palm plantations, considering the FPIC principle on the process	Collaborating with relevant departments and village governments in organizing training on economic land use	In line with the company's development plan, prioritizing the fulfillment of partnership programs in accordance with applicable regulations	<ul style="list-style-type: none"> - Local government at village level - Plasma cooperative (partnership) - Traditional institutions
		Monitoring and updating the number of people who join as company partners (plasma holders)			
High rate of FFB theft	<ul style="list-style-type: none"> - Providing clear area boundaries that are easy to identify - Setting limited access (open-close portal/entrance) - Putting the advisory/ information board related to threat and punishment against theft. Forming an integrated team involving the village government for security and patrolling 	<ul style="list-style-type: none"> - Doing patrol regularly - Monitoring theft cases regularly 	<ul style="list-style-type: none"> - Engaging the community and local government at village level - Determining and socializing the sanctions for theft - Creating patrol schedule 	2022 and continuous during the operational	<ul style="list-style-type: none"> - Local government at village level - Plasma cooperative (partnership) - Traditional Institutions
Increasing business opportunity and types of livelihood	Working with the community to identify the main potential in local business development	Monitoring the community impact of alternative livelihood programs	Working with related parties to provide entrepreneurship counseling and training	2022 - 2024	Local government at village and sub-district level
	Providing training, business guidance and business capital to community who are directly affected, regarding new business opportunity outside the agricultural sector		Participating in providing and complementing economy infrastructure	2022 and continuous during the operational of company	
			Reviving community businesses by prioritizing the use of local contractors who meet the required specifications	2022 and continuous during the operational of company	

Road damage	Performing road maintenance, especially for the roads frequently used by the company	Regularly monitoring the condition of roads frequently used by the company	Looking for alternative new roads that do not pass through community villages	2022 - 2024	<ul style="list-style-type: none"> - Local government at sub-district level - Local government at village level
Water Pollution	Not applying chemicals at river border areas that have already been planted with oil palm. Prioritizing organic materials, fertilization is done by injection, the circle(s) are treated manually, not by spraying chemicals	Monitoring river water quality, upstream and downstream of the river (within the company locations)	Determine river border demarcations, in accordance with regulations/guidelines and the results of HCV identification	Immediately	<ul style="list-style-type: none"> - Environmental services at Ketapang - Local government at village level - Local community
	Carrying out land enrichment/rehabilitation of the riparian area with oil palm plantations prior to replanting, with emphasis on natural succession		Carry out analysis of water quality	Once every 6 months	
	Towards river border areas with natural vegetation, coordinating with the community and local government to protect these areas from degradation and deliberate destruction		Carry out patrols within the Conservation Area	Once every month	
	Holding socialization about good and safe use of rivers and protection of river border areas to the community and employees		To monitor public perceptions regarding river pollution from company activities	Socialization of management and monitoring by involving multi-stakeholders	
Air Pollution	<ul style="list-style-type: none"> - Selection of systems, methods and technology of mobilization, land clearing, and construction of facilities and infrastructure which expected can reduce dust levels. 	To monitor air quality periodically, based on regulation	Doing water spraying before the physical working to prevent spread of dust particles	2022 and continuous during the operational, especially on dry season	<ul style="list-style-type: none"> - Environmental services at Ketapang - Local government at village level - Local community
	<ul style="list-style-type: none"> - Adjusting the vehicle speed at the location of the project area. 		Carry out the sampling test and analysis of air quality	Once every 6 months	

Facilities for the employee(s); emplacement, office equipment and supplies	Provide livable housing with adequate facilities, considering the company's capabilities and priority for development	Monitoring the suitability/repair of employee homes	Work with Civil engineering and estate management to fulfillment of employee housing needs and other standard facilities	2024 - 2025	- CE Area 8B - Tim social handling - Estate Manager SMJE
Inadequate childcare facility	Provide adequate childcare according to the priorities and needs of employees within 2 years	To monitor the condition of childcare, its safeties, cleanness, and number of caregivers with sufficient norms	Work with Civil engineering and estate management to fulfillment of childcare needs and other standard facilities	2022 - 2024	Estate Management
Workers considered inadequate clean water source that comes from the river	Build boreholes or construct water treatment plants	To monitor water quality periodically	Carry out analysis of water quality	2022 -2023	Estate Management
The road infrastructure that connects the divisions is often damaged	Carry out regular maintenance for all roads that connect between divisions	Coordinate with related unit to regularly monitor road conditions	Carry out regular maintenance for all roads that connect between divisions	Immediately and continuous during the operational, based on priority	Traction Dept., Estate Management
Employee shuttle transportation is not always available	Providing safe and adequate means of transportation for employee pick-up and drop-off	Coordinate with related department (unit operational) to monitor condition of employee pick-up transportation periodically.	Ensure safe vehicle conditions, with licensed drivers.	Immediately and continuous during the operational	Traction Dept., Estate Management
Less discipline and awareness related to Safety and Health	Create and implement strict rules and sanctions for all employees within the company	To monitor employee discipline levels in routine use of PPE	Provide proper PPE according to the national standard	Immediately and continuous during the operational of company	- Sustainability Dept. Estate Manager
	Provide proper PPE in sufficient quantity	To monitor the index perception of workers related to company regulations and safety implementation	Periodically inspection related to PPE usage	2022 and continuous. Inspection will be held periodically once a month	- Sustainability Dept. - Estate Manager
	Continuous and periodically socialization related to Safety & Health to the workers. Also, to use PPE during work.	To monitor the index perception of workers related to company regulations and safety implementation	Monitoring the suitability of PPE regularly	2022 and continuous	- Sustainability Dept. - Estate Manager

3. HCV Areas and HCS Forests

Management and Monitoring Recommendation

Threat assessment

Threat in this Assessment is assessed by applying the IUCN Threat Classification Scheme (Salafsky *et al.*, 2008) which identifies threats and their sources, and assesses the level of potential impacts or risks in each HCV-HCS area. Weighting is also applied to assess which threats are considered priorities, to which development of Management and Monitoring Plan will be referring. In general, there are five groups of threats to conservation areas, i.e., threats against biodiversity, rivers (including their riparian areas), forests, cultural reserves, and peatlands.

The output indicates that, in general, the intensity of threat impacts on conservation areas is considered medium-high, although most of them are currently potential threats. Threats with high intensity impacts include land conversion of naturally vegetated areas (including in riparian areas), logging, and poaching. Based on the assessment, it is understood that management and monitoring plan is developed to suppress threats that may potentially be eliminated and mitigate impacts from others that may not.

Table 3. The presence of important values and major threats

Conservation value	Summary of important values in the Assessment area	Major Threats	Threat Status
HCV 1	Population of endemic fauna and flora species or RTE species	Declining size and quality of wildlife habitat due to logging activities and lack of connectivity to potential habitats outside the area	Actual
		Poaching	Actual
		Landuse conversion and deterioration of riparian forest habitat, lowland mixed dipterocarp forest, and peat forest	Potential
		Forest and land fires	Potential
		Agrochemical residue and household waste bring the risks of deteriorating aquatic habitat	Potential
HCV 2	Smaller areas that provide key functions to the landscape such as connectivity and buffer	Logging activity	Actual
		Landuse conversion	Potential
		Forest and land fires	Potential

HCV 3	Mixed dipterocarp forest, peat swamp forest, freshwater swamp forest, riparian forest, and heath forest	Landuse conversion on naturally vegetated riparian areas for plantation and farming	Potential
		Forest encroachment and logging activity	Actual
		Forest and land fires	Potential
		Land subsidence on peat area	Potential
		Edaphic factor in heath forest	Actual
HCV 4	The presence of river and riparian area with natural vegetation/riparian forest serving as natural drainage for flood control, erosion and morpho-erosion control, and natural firebreak. Forested Seriung and Tujubelas Hills function as water catchment, flood and erosion control, and habitats to pollinating agents. Peat swamp forest to the south functions as flood control and natural firebreak	Logging activity	Actual
		Land clearing for farming or palm oil plantations around major rivers increases sedimentation in the river body, thus increasing flood risks	Potential
		Land clearing for farming or palm oil plantations around tributaries increases sedimentation in the river body, thus increasing flood risks	Actual
		Surface runoff carries agrochemical residues	Potential
		Forest and land fires	Potential
HCV 5	River and spring as sources of clean water	Agrochemical pollution	Potential
		Land clearing near sources of water	Actual
HCV 6	Cultural reserve sites (<i>tembawang</i> , <i>ponti</i> , and burial grounds)	Land clearing around sacred sites and burial grounds which may threaten the sites' presence	Potential
HCS	Presence of natural vegetation fragments in the riparian area of Penyawan River, Seriung Hill, Tujubelas Hill, and Division 1-2 Secondary Forest	Logging activity	Actual
		Landuse conversion	Potential
		Forest and land fires	Potential
Peat	Presence of peatland to the southwest of MU	Logging activity	Actual
		Landuse conversion	Potential
		Forest and land fires	Potential
		Land subsidence	Potential

The major causes or sources of threat that contribute to the pressures are mostly from external factor (community). This is because HCV areas are in areas where community freely use forest resources and these activities have long been carried out (before land acquisition by the Company). These include logging, poaching, and fishing in the rivers. As for internal threats, they come from the application of chemicals around riparian zones.

Recommendation by HCV

The main concerns in managing conservation areas include:

- 1) Stakeholder identification, including landowners of the conservation areas;
- 2) Collaborative verification with BKSDA and YIARI to ensure the presence of orangutan in the Assessment area;
- 3) Development of conservation area management and monitoring plan in a collaborative manner;
- 4) Prevention measures against activities potentially causing the destruction or loss of conservation values, e.g., disseminating information to community and installing information boards; and
- 5) Redesign of profit-sharing mechanism in plasma plantation development.

There are 52 HCV/HCVMA locations in the MU, most of which overlap with HCS areas. HCVMA are areas identified as HCVA as well as the surroundings that support HCV. An HCVMA is designed to mitigate both actual and potential threats, maintaining the HCVA key functions.

For riparian areas, HCVMA design includes 50 m wide buffer zones on each side of the riverbank for both areas that remain with natural vegetation and others that are already in the form of cultivation areas. Riparian areas also serve as wildlife corridors (Barclay *et al.*, 2017, and Lucey *et al.*, 2018), thus they are designed to connect forest patches serving as wildlife habitats, particularly between forests in the southeastern and western parts of the MU. Furthermore, small forest fragments in the MU are also designed as stepping stones to several wildlife species, such as birds from the *Bucerotidae* family (hornbill).

Table 4. HCVMA management and monitoring plan

No	Conservation Value	Map ID	Threat	Management Plan	Monitoring Plan	Frequency	Timeline	PIC
HCV 1								
1	All species	All IDs	Loss, destruction, and fragmentation of habitats and loss of important species as an implication of the loss of land cover due to landuse conversion and land fires	<ul style="list-style-type: none"> - Delineate and demarcate conservation areas (HCV and HCS). - Survey biodiversity to verify the presence of wildlife species that, although may potentially be found in the Assessment area, remain unidentified during the HCV assessment. - Form a collaborative team to monitor conservation areas, mitigate human-wildlife conflict and forest fires, and improve the quality of the conservation areas. - Install signboards on the presence of conservation areas. 	<ul style="list-style-type: none"> - Collaborate with West Kalimantan BKSDA and YIARI to ensure the presence of orangutan in the Assessment area. - Install camera traps and check them monthly. - Create Permanent Sampling Plots (PSP) to monitor plants and wildlife species in the conservation area. - To monitor conservation areas in the PSPs by documenting the presence of RTE, endemic, and protected species. 	<ul style="list-style-type: none"> - Vegetation Growth & key species presence will be monitored once every six months. - Periodic socialization and refreshment will be conducted twice per year. - Forest/conservation area patrols are 	- Start 2023 and continuous	<ul style="list-style-type: none"> - Sustainability Dept. - Responsible Land Use & Conservation Dept. - Management Unit

			<ul style="list-style-type: none"> - Disseminate information to staff, employees, and community on the importance of conservation areas. - Manage the direction of land clearing in potential development areas to move towards conservation areas, so that wildlife species can be led towards the direction and prevented from getting trapped outside the conservation areas instead. - Plant pioneer plant species in areas that have been cleared out of farming activities or land fires. - Enrich habitats by planting local plant species in logged areas. 	<ul style="list-style-type: none"> - Monitor the trend of growth of carbon stock in the PSPs. - Patrol to identify and mitigate any kinds of activities that may cause the loss of land cover. - Increase the patrol intensity during dry seasons to prevent forest and land fires. - To monitor the growth of planted vegetation. 	<ul style="list-style-type: none"> - conducted twice per week. - Monitoring at the PSP will be conducted once per month. 		
		Loss of wildlife species as an implication of poaching	<ul style="list-style-type: none"> - Disseminate information to staff, employees, and community on the prohibition to poach wildlife species and keep them as pets. - Collaborate with relevant authorities to regulate the use of air rifles by the community and workers. - Install signboards on hunting prohibition. - Regulate hunting system for community related to the wildlife species, set the hunting season based on the species population density, and limit the use of hunted animals for household consumption (subsistence) and not for sale. 	Patrol to prevent poaching.	Once per month	Start 2023 and continuous	<ul style="list-style-type: none"> - Sustainability Dept. - Responsible Land Use & Conservation Dept. - Management Unit
		Loss of plant species as an implication of illegal logging activity	<ul style="list-style-type: none"> - Disseminate information to staff, employees, and communities on logging prohibition. - Install signboards on logging prohibition. - Regulate community logging system by applying good silviculture practices, considering the population of species to log, ensuring that the logged timbers are for local community's personal or communal uses. - Plant local plant species in areas previously used as illegal logging sites. 	<ul style="list-style-type: none"> - Patrol to prevent illegal timber logging activity. - Monitor the growth of planted vegetation species. 	<ul style="list-style-type: none"> - Illegal logging activity patrol will be conducted once per month - Vegetation Growth & key species presence will be monitored once every six months 	Start 2023 and continuous	<ul style="list-style-type: none"> - Sustainability Dept. - Responsible Land Use & Conservation Dept. - Management Unit
		Human-wildlife conflict	<ul style="list-style-type: none"> - Collaborate with relevant authorities and experienced stakeholders to mitigate human-wildlife conflict. - Deliver training to mitigate conflict and handle emergency situations in case of wildlife attack. 	<ul style="list-style-type: none"> - To monitor locations of potential human-wildlife conflict. - Conduct intensive supervision on plantation operations near conservation areas. 	<ul style="list-style-type: none"> - Once per 3 months 	<ul style="list-style-type: none"> - Start 2023 and continuous 	<ul style="list-style-type: none"> - Sustainability Dept. - Responsible Land Use &

				- Develop integrated reporting procedures for cases of conflict between wildlife and workers/community.				Conservation Dept. - Management Unit
2	Pangolin	All IDs	Habitat loss	<ul style="list-style-type: none"> - Disseminate information to staff, employees, and communities on logging prohibition. - Install signboards on logging prohibition. - Regulate community logging system by applying good silviculture practices, considering the population of species to log, ensuring that the logged timbers are for local community's personal or communal uses. - Plant local plant species in areas previously used as illegal logging sites. - Assess population and habitat suitability. 	<ul style="list-style-type: none"> - Patrol to prevent illegal timber logging activity. - Monitor the growth of planted vegetation species. - Conduct integrated monitoring to increase the probability to encounter pangolin. 	<ul style="list-style-type: none"> - Once per month - Vegetation Growth & key species presence will be monitored once every six months. 	- Start 2023 and continuous	<ul style="list-style-type: none"> - Sustainability Dept. - Responsible Land Use & Conservation Dept. - Management Unit
			Poaching	<ul style="list-style-type: none"> - Coordinate with BKSDA and the relevant NGOs to disseminate information on pangolin poaching prohibition. 	<ul style="list-style-type: none"> - Patrol to prevent poaching. 	<ul style="list-style-type: none"> - Once per month 	- Start 2023 and continuous	<ul style="list-style-type: none"> - Sustainability Dept. - Responsible Land Use & Conservation Dept. - Management Unit
			Disconnected corridors	<ul style="list-style-type: none"> - Map pangolin encounter locations. - Map locations where pangolins often pass through and classify the vulnerability level of each location. - Where necessary, move pangolin from high-vulnerability locations to larger HCVA. - Install signboards on pangolin passing locations with high vulnerability. 	<ul style="list-style-type: none"> - Conduct integrated monitoring to increase pangolin encounter frequency and probability. - Update pangolin distribution data. - Conduct intensive monitoring on pangolin passing locations with high vulnerability. 	<ul style="list-style-type: none"> - Quarterly basis 	Start 2023 and continuous	<ul style="list-style-type: none"> - Sustainability Dept. - Responsible Land Use & Conservation Dept.
3	Müller's gibbon	All IDs	Habitat loss	<ul style="list-style-type: none"> - Conduct population and habitat suitability assessment. - Enrich habitats by planting gibbon's food plant species. 	<ul style="list-style-type: none"> - Update annual data on populations and habitats. - Monitor the growth of gibbon's food plant species. 	<ul style="list-style-type: none"> - Quarterly basis 	2023 and continuous during the operational activity	<ul style="list-style-type: none"> - Sustainability Dept. - Responsible Land Use & Conservation Dept.
			Loss of forest canopy	<ul style="list-style-type: none"> - Disseminate information to staff, employees, and communities on logging prohibition. - Install signboards on logging prohibition. 	<ul style="list-style-type: none"> - Patrol to prevent illegal timber logging activity. - Monitor the growth of planted vegetation species. 	<ul style="list-style-type: none"> - Once per month - Vegetation Growth & key species presence 	Start 2023 and continuous	<ul style="list-style-type: none"> - Sustainability Dept.

				<ul style="list-style-type: none"> - Regulate community logging system by applying good silviculture practices, considering the population of species to log, ensuring that the logged timbers are for local community's personal or communal uses. - Plant local plant species in areas previously used as illegal logging sites. 		will be monitored once every six months.		<ul style="list-style-type: none"> - Responsible Land Use & Conservation Dept. - Management Unit
4	Proboscis monkey	All IDs	Loss of habitat	<ul style="list-style-type: none"> - Conduct population and habitat suitability assessment. - Enrich habitat by planting food species. 	<ul style="list-style-type: none"> - Conduct regular monitoring. - Update annual data on population and habitat. - Monitor plant species. 	Quarterly basis	- 2023 and continuous during the operational activity	<ul style="list-style-type: none"> - Sustainability Dept. - Responsible Land Use & Conservation Dept.
			Disconnected corridors	<ul style="list-style-type: none"> - Disseminate information to staff, employees, and communities on logging prohibition. - Install signboards on logging prohibition. - Regulate community logging system by applying good silviculture practices, considering the population of species to log, ensuring that the logged timbers are for local community's personal or communal uses. - Plant local plant species in areas previously used as illegal logging sites. 	<ul style="list-style-type: none"> - Patrol to prevent illegal timber logging activity. - Monitor the growth of planted vegetation species. 	<ul style="list-style-type: none"> - Once per month - Vegetation Growth & key species presence will be monitored once every six months. 	Start 2023 and continuous	<ul style="list-style-type: none"> - Sustainability Dept. - Responsible Land Use & Conservation Dept. - Management Unit
			Human-wildlife conflict	<ul style="list-style-type: none"> - Collaborate with relevant authorities and experienced stakeholders to mitigate human-wildlife conflict. - Deliver training to mitigate conflict and handle emergency situations in case of wildlife attack. - Develop integrated reporting procedures for cases of conflict between wildlife and workers/community. 	<ul style="list-style-type: none"> - Monitor locations of potential human-wildlife conflict. - Conduct intensive supervision on plantation operations near conservation areas. 	Once per 3 months	Start 2023 and continuous	<ul style="list-style-type: none"> - Sustainability Dept. - Responsible Land Use & Conservation Dept. - Management Unit
5	Sun bear, muntjac, mouse-deer	All IDs	Loss of habitat	<ul style="list-style-type: none"> - Disseminate information to staff, employees, and communities on logging prohibition. - Install signboards on logging prohibition. - Regulate community logging system by applying good silviculture practices, considering the population of species to log, ensuring that the logged timbers are for local community's personal or communal uses. - Plant local plant species in areas previously used as illegal logging sites. 	<ul style="list-style-type: none"> - Patrol to prevent illegal timber logging activity. - Monitor the growth of planted vegetation species. - Conduct integrated monitoring to increase the probability to encounter sun bear, muntjac, and mouse deer. 	<ul style="list-style-type: none"> - Once per month - Vegetation Growth & key species presence will be monitored Once every six months. 	Start 2023 and continuous	<ul style="list-style-type: none"> - Sustainability Dept. - Responsible Land Use & Conservation Dept. - Management Unit

				- Assess population and habitat suitability.				
			Hunting	Coordinate with BKSDA and the relevant NGOs to disseminate information on sun bear, muntjac, and mouse deer poaching prohibition.	Patrol to prevent poaching.	Once per month	Start 2023 and continuous	- Sustainability Dept. - Responsible Land Use & Conservation Dept. - Management Unit
			Human-sun bear conflict	- Collaborate with relevant authorities and experienced stakeholders to mitigate human-wildlife conflict. - Deliver training to mitigate conflict and handle emergency situations in case of wildlife attack. - Develop integrated reporting procedures for cases of conflict between wildlife and workers/community.	- To monitor locations of potential human-wildlife conflict. - Conduct intensive supervision on plantation operations near conservation areas.	Once per 3 months	Start 2023 and continuous	- Sustainability Dept. - Responsible Land Use & Conservation Dept. - Management Unit
6	Felidae group (marbled cat and leopard cat)	All IDs	Poaching for pet	- Disseminate information to staff, employees, and community on the importance of Felidae species for pest control in plantation areas.	Patrol to prevent poaching	Once per month	Start 2023 and continuous	- Sustainability Dept. - Responsible Land Use & Conservation Dept. Management Unit
7	Cercopithecidae group, such as pig-tailed macaque and long-tailed macaque	All IDs	Human conflict because these species are considered agricultural pests	Build capacity and deliver training on techniques to drive away pig-tailed macaque and long-tailed macaque from community farms.	Map community lands and their disturbance intensity.			
8	Bucerotidae group (wrinkled hornbill, rhinoceros hornbill, and black hornbill)	All IDs	Loss of habitat and corridor	- Map nesting and stepping stone trees, both in conservation and plantation areas. - Preserve large trees as stepping stones during land clearing. - Enrich conservation area by planting fig trees (<i>Ficus</i> sp.) as food plants	- Conduct regular monitoring of these birds on locations they fly through.	- Monthly basis	- Start 2023 and continuous	- Sustainability Dept. - Responsible Land Use & Conservation Dept.
			Poaching	Disseminate information to staff, employees, and community on the importance of these species for as indicator of good quality forest.	Patrol to prevent poaching	Once per month	Start 2023 and continuous	- Sustainability Dept. - Responsible Land Use &

								Conservation Dept. - Management Unit
			Logging	<ul style="list-style-type: none"> - Regulate community logging system by applying good silviculture practices, considering the population of species to log, ensuring that the logged timbers are for local community's personal or communal uses. - Plant local plant species in areas previously used as illegal logging sites. 	<ul style="list-style-type: none"> - Patrol to prevent illegal timber logging activity. - Monitor the growth of planted vegetation species. 	<ul style="list-style-type: none"> - Once per month - Vegetation Growth & key species presence will be monitored once every six months. 	Start 2023 and continuous	<ul style="list-style-type: none"> - Sustainability Dept. - Responsible Land Use & Conservation Dept. - Management Unit
9	Raptor bird group (black-winged kite, brahminy kite, bat hawk, crested goshawk, and black-thighed falconet)	All IDs	Loss of habitat and corridor	<ul style="list-style-type: none"> - See 'all species' section on loss of habitat. - Map nesting and stepping stone trees, both in conservation and plantation areas. - Preserve large trees as stepping stones during land clearing. 	See 'all species' section on loss of habitat.			
			Poaching for pet	<ul style="list-style-type: none"> - See 'all species' section on hunting. - Disseminate information to staff, employees, and community on the importance of raptor bird species for controlling pests in plantation areas. 	Patrol to prevent poaching	Once per month	Start 2023 and continuous	
			Logging	<ul style="list-style-type: none"> - Regulate community logging system by applying good silviculture practices, considering the population of species to log, ensuring that the logged timbers are for local community's personal or communal uses. - Plant local plant species in areas previously used as illegal logging sites. 	<ul style="list-style-type: none"> - Patrol to prevent illegal timber logging activity. - Monitor the growth of planted vegetation species. 	<ul style="list-style-type: none"> - Once per month - Vegetation Growth & key species presence will be monitored once every six months. 	Start 2023 and continuous	<ul style="list-style-type: none"> - Sustainability Dept. - Responsible Land Use & Conservation Dept.t - Management Unit
10	Dusky munia	All IDs	No serious threats are identified	See 'all species' section.	See 'all species' section.			
11	Barn swallow	All IDs	No serious threats are identified	See 'all species' section.	See 'all species' section.			
12	Aquatic species (estuarine crocodile, false gharial, Malayan soft-	5, 7, 23, 24, 28	Loss of habitat	<ul style="list-style-type: none"> - Conduct assessment on the presence of amphibian and aquatic biota to indicate disturbed environments. 	<ul style="list-style-type: none"> - Monitor amphibian species presence, particularly in water streams used as sources of drinking water. 	Once per 6 months	Start 2023 and continuous	<ul style="list-style-type: none"> - Sustainability Dept. - Responsible Land Use & Conservation Dept.
			Poaching for food	<ul style="list-style-type: none"> - Disseminate information to staff, employees, and community on the importance of these species as indicator of good ecosystem. 	<ul style="list-style-type: none"> - Patrol to prevent poaching 	Once per month	Start 2023 and continuous	<ul style="list-style-type: none"> - Responsible Land Use & Conservation Dept.

	shelled turtle, and several species of amphibian group)								- Management Unit
			Human-crocodile conflict	<ul style="list-style-type: none"> - Collaborate with relevant authorities and experienced stakeholders to mitigate human-wildlife conflict. - Deliver training to mitigate conflict and handle emergency situations in case of wildlife attack. - Develop integrated reporting procedures for cases of conflict between wildlife and workers/community. - To put the signboard according to the presence of crocodiles in the river 	<ul style="list-style-type: none"> - To monitor locations of potential human-wildlife conflict. - Conduct intensive supervision on plantation operations near conservation areas. 	Once per 3 months	Start 2023 and continuous	<ul style="list-style-type: none"> - Sustainability Dept. - Responsible Land Use & Conservation Dept. - Management Unit 	
13	Other reptile species group (king cobra, Sumatran cobra, reticulated python)	Entire MU	Human-venomous snake conflict	<ul style="list-style-type: none"> - Collaborate with relevant authorities and experienced stakeholders to mitigate human-wildlife conflict. - Deliver training to mitigate conflict and handle emergency situations in case of wildlife attack. - Develop integrated reporting procedures for cases of conflict between wildlife and workers/community. - Disseminate information to employees on use of Personal Protective Equipment (PPE) to avoid venomous snake bite and cobra venom spat. - Provide anti-snake venom serum in the Company clinics. 	<ul style="list-style-type: none"> - To monitor locations of potential human-wildlife conflict. - Conduct intensive supervision on plantation operations near conservation areas. 	Once per 3 months	Start 2023 and continuous	<ul style="list-style-type: none"> - Sustainability Dept. - Responsible Land Use & Conservation Dept. - Management Unit 	
14	Important tree species with high economic value, including <i>keruing</i> (<i>Dipterocarpus tempehes</i>), balau (<i>Shorea laevis</i>), swamp meranti (<i>Shorea uliginosa</i>), and Bornean ironwood (<i>Eusideroxylon zwagerii</i>)	All IDs, particularly 4, 23, and 24	Logging that causes loss of biodiversity and loss of important wildlife habitat	<ul style="list-style-type: none"> - Label trees with RTE, endemic, and protected status. - Replant logged areas using local tree species of ecological value to serve as food plants for wildlife. 	<ul style="list-style-type: none"> - Implement Chain of Custody (CoC) to identify the origin of timbers circulating in the Assessment area. - Monitor disturbances and tree sapling growth rates in logged areas. - Prepare PSPs (Monitoring and Evaluation Plan) to monitor the development of trend of biomass carbon stock value. 	<ul style="list-style-type: none"> - Tree sapling and disturbances will be monitored once every six months. - PSP document per 3 years, and its monitoring will be on annual basis (yearly). 	2023 and continuous during the operational activity	<ul style="list-style-type: none"> - Responsible Land Use & Conservation Dept. - Sustainability Dept. - Unit Operational - Climate Risk Mitigation Dept. 	

15	Other important plant species, including <i>dedera</i> (<i>Horsfieldia borneensis</i>), <i>kelat api</i> (<i>Syzigium tenuicaudatum</i>), lamantan (<i>Mangivera similis</i>), <i>Baccaurea edulis</i> , <i>Popowia cf. odoardi</i> , and <i>Macaranga pearsonii</i> .	All IDs	Logging that causes loss of biodiversity and important wildlife habitats	<ul style="list-style-type: none"> - Label trees with RTE, endemic, and protected status. - Replant logged areas using local tree species of ecological value to serve as food plants for wildlife. 	<ul style="list-style-type: none"> - Implement Chain of Custody (CoC) to identify the origin of timbers circulating in the Assessment area. - Monitor disturbances and tree sapling growth rates in logged areas. - Prepare PSPs (Monitoring and Evaluation Plan) to monitor the development of trend of biomass carbon stock value. 	<ul style="list-style-type: none"> - Tree sapling and disturbances will be monitored once every six months. - PSP document per 3 years, and its monitoring will be on annual basis (yearly). - 	2023 and continuous during the operational activity	<ul style="list-style-type: none"> - Responsible Land Use & Conservation Dept. - Sustainability Dept. - Unit Operational - Climate Risk Mitigation Dept.
HCV 2								
16	Part of wider landscape	4	<ul style="list-style-type: none"> - Logging and landuse conversion - Forest and land fires 	<ul style="list-style-type: none"> - Maintain HCVA intactness through gazettement and demarcation. - Conduct reforestation and enrich vegetation in cleared or degraded HCVMA. - Facilitate village governments to develop village spatial plans concerning designation of cultivation and protected areas. - Maintain potential manmade firebreaks, such as plantation road or main drain, including (i) reducing fuel availability (e.g., piled frond and twig) around the areas; and (ii) construct slightly convex roads to allow the formation of channels on both sides of the road. - Maintain plantation roads to support accessibility of emergency response team or fire patrol team. - Map the locations of sources of water for land fire management. 	<ul style="list-style-type: none"> - To monitor HCVA boundaries. - Monitor vegetation growth (growth percentage) - Document every meeting with stakeholders. - Document number of fire events, supplemented with documentation and official report. - Coordinate with neighbouring companies and local governments to mitigate forest and land fires. - On a regular basis, patrol during dry seasons (July-September). - Monitor firebreaks, particularly in July-September. - Monitor water discharge in sources of water for fire management. 	<ul style="list-style-type: none"> - Quarterly basis - Vegetation Growth & key species presence will be monitored once every six months. - Once per week for patrols in dry seasons 	2023 and continuous during the operational activity	<ul style="list-style-type: none"> - Responsible Land Use & Conservation Dept. - Sustainability Dept. - Unit Operational - Climate Risk Mitigation Dept.
HCV 3								
17	Ecosystems of riparian forest, peat swamp forest, lowland	2, 4, 5, 7, 10, 11, 12, 13, 19, 20,	Logging and land conversion	<ul style="list-style-type: none"> - Maintain HCVA intactness through gazettement and demarcation. 	<ul style="list-style-type: none"> - To monitor HCVA boundaries. - To monitor vegetation growth (growth percentage). 	<ul style="list-style-type: none"> - Quarterly basis - Vegetation Growth & key species presence will be monitored 	2023 and continuous during the operational activity	<ul style="list-style-type: none"> - Responsible Land Use & Conservation Dept.

	dipterocarp forest, and heath forest	22, 23, 24, 27, and 28		<ul style="list-style-type: none"> - Conduct reforestation and enrich vegetation in cleared or degraded HCVMAS. - Facilitate village governments to develop village spatial plans concerning designation of cultivation and protected areas. 	<ul style="list-style-type: none"> - Document every meeting with stakeholders. 	once every six months.		<ul style="list-style-type: none"> - Sustainability Dept. - Unit Operational
			Forest and land fires	<ul style="list-style-type: none"> - Develop fire management SOP, including emergency response and reporting to relevant authorities. - Establish task force for land fire mitigation and management, supported by trainings, facilities, and infrastructures. - Disseminate information on danger of land fires and install signboards to warn of the danger. - Collaborate with communities, village governments, and relevant authorities to control use of fire for developing farm. - Maintain potential manmade firebreaks, such as plantation road or main drain, including (i) reducing fuel availability (e.g., piled frond and twig) around the areas; and (ii) construct slightly convex roads to allow the formation of channels on both sides of the roads. - Maintain plantation roads to support accessibility of emergency response team or fire patrol team. - Map the locations of sources of water for land fire management. - Implement good water management system on peatland. - Implement fire information system, including early warning system based on drought index or monitoring from fire watchtower, as well as Fire Danger Rating System (FDRS). 	<ul style="list-style-type: none"> - Document SOP information dissemination events and reporting documentation. - Document number of fire events, supplemented with documentation and official report. - Coordinate with neighbouring companies and local governments to mitigate forest and land fires. - On a regular basis, patrol during dry seasons (July-September). - Monitor firebreaks, particularly in July-September. - Monitor water discharge in sources of water for fire management. - Monitor peatland water table. - Document FDRS-related reports. 	<ul style="list-style-type: none"> - Once per week for patrols in dry seasons - Peatland water table: once per week using automatic digital monitoring tools. 	2023 and continuous during the operational activity	<ul style="list-style-type: none"> - Unit operational - Climate Risk Mitigation Dept.
HCV 4								

18	Hydrological functions of the major rivers: Semandang (Batang Prodam) River, including its riparian areas	4, 22-24	<ul style="list-style-type: none"> - Logging - Landuse conversion on riparian areas 	<ul style="list-style-type: none"> - Disseminate information on the presence and important functions of rivers and their riparian areas. - Collaborate with stakeholders to develop conservation programmes for rivers and their riparian areas. - Install signboards to prohibit logging and land clearing for farm/plantation in riparian areas. - Identify community members who carry out logging activities and implement community empowerment programmes. - Delineate buffer zones by installing boundary signs/markers relevant to the riparian width. 	<ul style="list-style-type: none"> - Document meetings with stakeholders. - Conduct regular monitoring in riparian boundaries identified as HCVA. - Prepare official reports on signboard installation. - Assist land clearing contractors and prepare land clearing official report. 	Once every 6 months	2023 and continuous during the operational activity	<ul style="list-style-type: none"> - Responsible Land Use & Conservation Dept. - Sustainability Dept. - Unit Operational
19	Hydrological functions of tributaries and springs, including their riparian areas	1, 18, 23, 28	Agrochemical residue carried by runoff	<ul style="list-style-type: none"> - Install signboards and disseminate prohibition of agrochemical use in riparian areas. - Conduct manual weeding in riparian areas planted with oil palms. - Delineate buffer zones by installing boundary signs/markers relevant to the riparian width. 	<ul style="list-style-type: none"> - Document information dissemination events to stakeholders. - Prepare official reports on signboard installation. - Check water quality at monitoring points, i.e., river inlets and outlets in the Assessment area (visually checked or tested at laboratory). 	Water quality analysis test once per 6 months	2023 and continuous during the operational activity	<ul style="list-style-type: none"> - Sustainability Dept. - Unit Operational
			Conversion of riparian area into plantation and farm	<ul style="list-style-type: none"> - Collaborate with communities, local governments, other companies, and NGOs to develop river conservation and protection programmes. - Disseminate information to land clearing contractors regarding riparian area boundaries to prevent over-clearing. - Prevent replanting in riparian areas relevant to the riparian width. - Strengthen streambanks prone to landslide using civil engineering techniques or vegetation enrichment (it is recommended to use native tree species and/or species with deep and strong rooting). - Construct sediment traps/gully plugs along rivers or tributaries in the Assessment area, particularly in areas with rolling slope. 	<ul style="list-style-type: none"> - Document meetings with stakeholders. - Conduct regular monitoring on riparian area boundaries identified as HCVA. - Assist land clearing contractors and prepare land clearing official reports. - Monitor and document civil structures and/or vegetation growth (growth percentage). 	Once every 6 months	2023 and continuous during the operational activity	<ul style="list-style-type: none"> - Responsible Land Use & Conservation Dept. - Sustainability Dept. - Unit Operational
20	Environmental service functions of hilly areas	4, 22, 27, and 28	<ul style="list-style-type: none"> - Logging - Land clearing 	<ul style="list-style-type: none"> - Maintain HCVA intactness through gazettement and demarcation. - Conduct reforestation and enrich vegetation in cleared or degraded HCVMAs. 	<i>See HCV 2 and HCV 3 sections.</i>			

				- Facilitate village governments to develop village spatial plans concerning designation of cultivation and protected areas				
21	Erosion management areas	10, 11, 12, 13, 15, 22, 25, 28	Land conversion without management	<ul style="list-style-type: none"> - Develop SOPs for soil and water conservation. - Construct bench or individual terraces following the specific situations in each location. Rather steep areas can be planted with vetiver grass to strengthen the terrace slopes. - Construct silt pits in planting areas and roadside pits. - Construct sediment traps/gully plugs along rivers or tributaries in the Assessment area, particularly in areas with undulating slope. - Plant Legume Cover Crops (LCC) on newly planted areas. 	<ul style="list-style-type: none"> - Monitor and document TSS in major river inlets and outlets. - Conduct maintenance of civil engineering constructions, including terrace, silt pit, and sediment trap. - Monitor and maintain LCC to prevent them from passing planting blocks or covering the main crops. - Document activities implemented for soil and water conservation. 	Once every 6 months	Start on 2023 and continuous during the operational	Unit operational
HCV 5								
22	Rivers for fishing and springs as source of water	4, 23, 24	<ul style="list-style-type: none"> - Landuse conversion on riparian areas - Agrochemical residue 	<ul style="list-style-type: none"> - Collaborate with stakeholders to develop conservation programmes for rivers and their riparian areas. - Install signboards to prohibit logging and land clearing for farm/plantation in riparian areas. - Delineate buffer zones by installing boundary signs/markers relevant to the riparian width. - Conduct manual weeding in riparian areas planted with oil palms. - Prohibit fishing using electricity and toxic chemicals. 	<ul style="list-style-type: none"> - Conduct regular monitoring in riparian boundaries identified as HCVA. - Check water quality at monitoring points, i.e., river inlets and outlets in the Assessment area (visually checked or tested at laboratory). 	Once every 6 months	Start on 2023 and continuous during the operational	<ul style="list-style-type: none"> - Responsible Land Use & Conservation Dept. - Sustainability Dept. - Unit Operational
HCV 6								
23	Sites with cultural and historical values	22	Potential loss of HCV 6 area	<ul style="list-style-type: none"> - Conduct further study to confirm cultural and historical values of sites in the MU. - Document stakeholders related to HCV 6 elements. - Develop communication with stakeholders and encourage the participatory development of management plan. 	<ul style="list-style-type: none"> - Organise annual meetings to document HCV element management progress. - Document every meeting with stakeholders. 	Once every 6 months	Start on 2023 and continuous during the operational	<ul style="list-style-type: none"> - Responsible Land Use & Conservation Dept. - CSR Dept. - Unit Operational
HCS Forest								
24	Natural vegetation fragments on	37,17,7, 38	<ul style="list-style-type: none"> - Logging - Forest and land fires 	<ul style="list-style-type: none"> - Provide support and assistance to extinguish fire, including facilitating emergency response team establishment and training and tool provision. 	<ul style="list-style-type: none"> - Document number of fire occurrences, supplemented with documentation and official report. 	Once every 6 months	Start on 2023 and continuous during the operational	<ul style="list-style-type: none"> - Responsible Land Use &

	riparian areas of Penyawan River, Seriung Hill, Tjujuhbelas Hill, and Division 1-2 secondary forests		- Land conversion	- Disseminate information and install signboards on fire events. - Prohibit encroachment of undisturbed areas.	- Coordinate with local governments to mitigate forest and land fires. - Patrol regularly during dry seasons. - Analyse land cover based on UAV images and survey output.			Conservation Dept. - Climate Risk Mitigation Dept. - Unit Operational
Peat								
25	Peat area to the southwest of the MU	4	- Logging - Forest and land fires - Land conversion - Land subsidence	- Disseminate information and install signboards containing information of forest fire and land clearance prohibition. - Prepare SOP on peatland management, including SOP on water management. - Map locations of alternative sources of water for fire response team. - Collaborate with stakeholders to prepare peatland management plan. - Develop water management grand design that prevents against drainage construction on peatlands. - Instal subsidence markers on locations that are already cultivated areas.	- Maintain plantation roads to support accessibility of fire emergency response team or fire patrol team. - Coordinate with the Government (at the local or national levels) for mitigation of forest and land fires - Monitor land cover change annually.	- On a regular basis (quarterly), particularly in dry seasons.	Start on 2023 and continuous	- Responsible Land Use & Conservation Dept. - Unit Operational

Cross-Value Recommendations

General management applied to each conservation area, includes:

- (1) conservation area designation;
- (2) information dissemination and stakeholder engagement; and
- (3) capacity building for conservation area management.

In carrying out such activities, estate management should collaborate with community, village governments, relevant organisations and agencies, and neighbouring companies around the Assessment area.

Table 5. Management that generally applies to each conservation area

Designation of Conservation Area	Information Dissemination and Engagement in Conservation Area Management	Capacity Building
<ul style="list-style-type: none"> • Conduct field delineation, verification, and establish conservation area definitive map. • Establish boundary markers for conservation areas (delineation). • Install signboards in conservation areas. 	<ul style="list-style-type: none"> • Neighbouring companies • Local communities (village government, traditional organisation, and general public) • Government agencies • NGOs 	<ul style="list-style-type: none"> • Deliver trainings on conservation area monitoring (basic identification, water quality measurement, and other aspects relevant to sustainability). • Implement Standard Operational Procedures (SOP) on consistent policies on monitoring of conservation areas.

4. Stakeholder and local people engagement (FPIC process)

Table 6. Management & Monitoring Plan of FPIC Issue

Social Impact	Management Plan	Monitoring Plan	Activities	Timeframe	Stakeholder Engagement
Land ownership status	<ul style="list-style-type: none"> - Conduct a participatory mapping by involving community representative(s), local government, and traditional institutions to ensure community land within the company concession. - Negotiate with the people who are willing to release their land, considering the FPIC principal. - Respect their rights to the lands which have not been compensated. 	Monitor land use by the community, prevention of land use by burning.	<ul style="list-style-type: none"> - Engagement with the community - Landowner identification and mapping 	Once every year and/or when needed	<ul style="list-style-type: none"> - Local government at sub-district level - Local government at village level - Plasma cooperative (partnership) - Traditional Institutions

Diversity of perceptions (positive and negative) of the community towards the company, as well as high expectations from the community	<ul style="list-style-type: none"> - See and explore community needs through CSR and community development programs. - Coordinate with local government at village level and traditional institution. 	Monitor public perception of the company through regular meetings.	<ul style="list-style-type: none"> - Carry out an inventory of community & village potential. - Create business opportunities that are integrated with plantation operations so that there is market guarantee. - Provide community development/empowerment training to community groups with the hope of the community being positively impacted increasing. 	2022 - 2024	<ul style="list-style-type: none"> - Local government at village level - Traditional Institutions - Local community
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5. Soil and Topography

The following is a summary of the limiting factors for the 7 land suitability areas and their management recommendations:

1. Dry Months/ Dry Season

The seven Soil Map Units all had one dry month in the last 5 years. A dry month is a condition where the amount of accumulated rainfall in one month is <60 mm. The following are recommendations for land management for oil palm during the dry months:

- Fertilization should be stopped during the dry months.
- Planting Cover Crops such as beans during immature plants and Nephrolepis during mature plants can maintain soil moisture for longer.
- During the dry season, forage slashing activities can be prioritized because apart from adding organic material, it also reduces the rate of evaporation (transpiration).
- Construction of water blocks in Main Road/ Collection Road ditches, especially in the Quartzpsamment, Palaeudult and Plinthudult areas to maintain water availability
- Construction of reservoirs, especially in sandy areas, to inject water into the land
- Irrigation with considering the socio-environment

2. Elevation and Slope

Wavy to hilly slope conditions are found on Soil Map Unit Typic Paleudults, Typic Dystrudepts and Plinthudult at PT KML. In order to conserve soil and water to support oil palm plants in areas with wavy to hilly slopes, management planning is carried out as follows:

Area Classification	Soil & Water Conservation Facilities
Flat-Undulating	<ul style="list-style-type: none"> - Plant of Land Cover Crops - Application of empty bunches - Arrangement of palm fronds - Conservation ditch(es)/rorak
Rolling	<ul style="list-style-type: none"> - Plant of Land Cover Crops - Plant of vetiver - Application of empty bunches - Arrangement of palm fronds - Conservation ditch(es)/ rorak with terrace fortifications
Hilly	<ul style="list-style-type: none"> - Plant of Land Cover Crops - Plant of vetiver - Application of empty bunches - Arrangement of palm fronds - Conservation ditch(es)/ rorak with terrace fortifications - Individual terrace/platform - Contour terrace with stop bund
Low-lying land in each land slope classification	<ul style="list-style-type: none"> - Plant of Land Cover Crops - Arrangement of palm fronds - Drainage ditches - Oil palm landfill sites

Also, in sloping areas that are prone to leaching nutrients, it is necessary to apply Kieserite fertilizer at a dose of 1 – 1.5 kg/tree.

3. Management of Low-land Area

The obstructed drainage classes are in Soil Map Unit: Typic Endoaquepts, Dystrudept and Typic Udifluvents. Management planning is carried out as follows:

- Construction of drainage channels in the form of outlet ditches, main drains, and collection drains
- Creation of landfill sites in the basin area
- Making in-field trenches 8:1, 4:1, or 2:1 (depending on area conditions)
- Construction of elevated ditches on kaolin soil (Dystrudept) which experiences flooding after rain
- Application of fertilizer by pocketing in areas prone to temporary flooding
- Arrange fertilizer application when rainfall is low and the distance between rotations is shortened

4. Management at the area of Quartzpsamment, Plinthudult and Paleudult areas

- Application of composted organic material or empty bunches
- Plant of land cover crops
- Forage slashing once every 4 months
- Arrange the fronds in a zigzag form
- Application of special micro fertilizer in sand areas, namely micro compound with dose of 100 - 150 gr/tree
- Creation of focal feeders in the Quartzpsamment and Plinthudult areas to improve the physical, chemical, and biological properties of the soil
- Construction of road side pits in areas with sloping topography for rain harvesting into blocks

5. Management at the area of Haplosaprist

- Construction of drainage channels to manage water surface levels
- Maintain a water level of 40 cm above the ground surface to prevent subsidence by creating water barriers
- Make subsidence poles, piezometers and water levels to monitor water levels and take action to prevent subsidence
- Fertilize with special micro compound fertilizer at a dose of 100 – 150 gr/tree

6. Soil pH

The soil pH below 4 is found in Soil Map Units Typic Haplosaprist, Typic Endoaquept, Typic Dystrudepts and Typic Udifluvents. Management recommendations include:

- Regular application of Dolomite (1-1.5 kg/tree/year)
- Addition of composted organic material or empty bunches (100 – 200 kg/tree/year)

- Application of boiler ash (if there it is close to palm oil mill) with dose of 10 kg/tree

The Operational Units (Assistant, Estate Manager to Area Controller) will be responsible for managing the plantation based on the identified land type and suitability, by obtaining assistance from the Research Department.

Since there are areas with high slopes (> 45) in potential development areas for community within the PT KML concession, the company does not prohibit the community from using this area as an oil palm plantation, especially if the community clearance and manages the area independently. In the future, if the community willing to become a partner with PT KML, then the management of those area will follow the PT KML's policies and procedures.

6. GHG

6.1. Steps to Manage and Increase the Carbon Stock

6.1.1. Land Use Change / New Planting

Land conversion appeared as the largest emission factor contributing to 64,107.96 tCO₂e.

Target : Reduction of emissions from land clearing activities

Action Plan : 1. No land clearing of conservation and forest area
2. Management plan of conservation areas
3. Development of fire mitigation and completion of firefighting equipment

6.1.2. Carbon Crop Sequestration

Carbon crop sequestration contributes to emissions reductions of -74,920.42 tCO₂e.

Target : Increase of carbon crop sequestration

Action Plan : 1. Use of seeds with high production potential

2. Use of land cover crops

6.1.3. Fertilizer

Emission source: manufacturing of the fertilizer and its application on the field.

Target : Emission reduction from fertilizing

Action Plan : 1. Leaf & soil analysis to obtain the data of optimal amounts of fertilizer applied
2. Empty bunch used for mulching (composting)
3. Fertilizers application technique based on topography
4. Proper fertilization dose, right time, and place, and in accordance with the Good Agricultural Practice

6.1.4. Diesel Consumption in Operation

Fuel Consumption in the field contributed to 3,091.55 tCO₂e.

Target : Reduction of emission from Diesel Consumption in Operation

Action Plan : 1. Good maintenance of vehicles and other equipment, periodically
2. Safety of driving related training

6.1.5. HCV Crop Sequestration

Crop sequestration from the conservation area contributes to emission reduction of -6,245.52 tCO₂e.

Target : Increase of carbon sequestration

Action Plan : 1. Rehabilitation on the Conservation Areas which has open land and/or bushes as a land cover

2. Monitor the Conservation Area from any other activities
3. Work with the local community to protect the Conservation Area

In order to reduce carbon emissions when the plantation has finished the land clearances, and it continuous to operation and producing the FFB, the company will send its FFB to mills under one company group. Where in this mill there will be an installation for POME management, at least a belt press system or methane capture/ flare system.

6.2. Monitoring of the Action Plan implementation

6.2.1. Land Use Change/ New Planting

Monitoring of land clearing

Action Plan	Timeline
To monitor the plans for land clearing and its realisation	January 2024 – December 2026 (During land clearing phase)

6.2.2. Carbon Crop Sequestration

Monitoring carbon crop sequestration

Action Plan	Timeline
To make sure that seed is good quality and with a government license	January 2024 – December 2026 by QC Dept.
To monitor the realisation of oil palm planting & legume cover crops	January 2024 – December 2026 by QC Dept.
To minimise the FFB losses	On mature plant by Quality Agronomy Control Dept.

6.2.3. Fertilizer

Monitoring fertilizer emissions

Action Plan	Timeline
To monitor leaf and soil analysis activity	Once every 1 year, on April – May by Research Dept.
To monitor empty bunch application for mulching	When its applied by Quality Control Dept.
To monitor plan and realisation of fertilizer application	Every fertiliser application by Estate Assistant and QC Dept.

6.2.4. Diesel Consumption for Transport



Monitoring fuel consumption in the operational activity

Action Plan	Timeline
To monitor the fuel consumption of each device and vehicle	Every month by Traction Dept.
To analyse work of equipment compared to its fuel consumption	Every month by Traction Dept.
To monitor planning & realisation of training related with driving safety	Once every 6 months by Training Center

6.2.5. HCV Crop Sequestration

Monitoring carbon sequestration of the HCV – HCS Areas

Action Plan	Timeline
To monitor the planning and realisation of HCV areas rehabilitation, where the land cover is grassland or open land	Once every 6 months by Responsible Landuse and Conservation Dept.

6	Acceptance of Management Plans	Name of Person Responsible	Martin Mach
		Designation	Deputy Head of Environmental Protection & Governance
		Signature	
		Name of Person Responsible	Wedy Sulistyono
		Designation	Director
		Signature	
		Date	12 October 2023