



EXECUTIVE SUMMARY

1.0 INTRODUCTION

The title of the proposed project is “***Cadangan 404 Hektar Projek Pengkayaan Hutan Dengan Pokok Getah (Spesis Getah Klon Balak) Di HSK Balah Kompatmen 143 (Sebahagian), Kompatmen 144 (Sebahagian), Kompatmen 176 (Sebahagian), Kompatmen 178 (Sebahagian) dan Kompatmen 179 (Sebahagian), Mukim Ulu Nenggiri, Daerah Bertam,, Gua Musang, Kelantan Darul Naim***”.

The detail of project proponent and environmental consultant for the proposed project is as below:

a) **Project Proponent:**

JANA ARMADA SDN BHD

485, Tingkat 1 & 2, Lembah Sireh,

Jalan Sultanah Zainab,

15050 Kota Bharu,

Kelantan Darul Naim.

Tel: 09 – 960 0598 Fax: 09 – 960 0598

Attention: Mr. Lai Ying Haur (Manager)



b) **EIA consultant:**

GS ALAM LESTARI SOLUTIONS

PT 1220, Tingkat 1,
Taman Bendahara,
16100 Kota Bharu,
Kelantan Darul Naim.

Attention: Mr. Mohd Zikri Bin Azmi



1.1 Legal Requirement

This proposed project falls under **Activity 5 (e)** in the **First Schedule** of the **Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order 2015** which describes that the **“Development of planted forest covering an area of 100 hectares or more but less than 500 hectares.”**

2.0 PROJECT DESCRIPTION

a) Project Location

The general location of proposed project site is located approximately between latitude 05°08'42.11"N - 05°10' 38.78"N and longitude of 101°42'25.88"E - 101°43'37.27"E. The nearest major town is Gua Musang town about 73.0 km (actual distance) to the southeast of proposed project site. Based on site survey during field work, as well as information gathered from JAKOA Negeri Kelantan & Terengganu, the nearest Orang Asli settlement are Orang Asli Kg. Bering (Pos Pasik) was located 1.0 km east from the project boundary.



d) Access Road

The existing main road to the proposed site is by using route D29 (Jelawang – Gua Musang). To enter the proposed project site, it can be accessed from Kg. Meranto by using the existing logging track before reach the proposed project site which is about 43.0. The entrance of this access road located at the east of project site.

e) Project Concept

The proposed project site involves a total of 404.0 hectares of land area will be developed with **rubber forest plantation**. The rubber forest plantation will be planted at slope area that less than 25 degree. While method silviculture (forest timber trees) will be applied at the whole area including the slope area more than 25 degree to re-establish the logger over within proposed project site. Silviculture is the act of renewing tree cover by establishing young trees naturally or artificially, generally promptly after the previous stand or forest has been removed.

f) Phase Development

The development phase for this proposed project will adopt a sustainable plantation which applied zero burning technique as an environmental friendly land preparation method to minimize the impact to the environment. The **rubber forest plantation** process will be executed in four (4) phase which is every phase will divided into block.



3.0 EXISTING ENVIRONMENT: PHYSICAL

a) Surrounding Land Use

According to **Rancangan Struktur Negeri Kelantan (RSNK 2020)** and **Rancangan Tempatan Jajahan Gua Musang (RTJGM 2020)** revealed that proposed project site is located within Forest Reserve area. Most of the forest land is under the Balah Forest Reserve covers an area of about 55,664 hectares which is located at the east, south, west, and north part of proposed project site. While, about 3-5 km at the northeast and north of proposed project site, there are existing oil palm plantation owned by **Golden Palm Growers Sdn. Bhd.** and Timber Latex Clone (TLC) Plantation by **Kompleks Perkayuan Kelantan (KPK) Sdn. Bhd.**

b) Topography

The general topography of the proposed project site and its surrounding areas is undulating to the hilly landscape of southwest of the project area to the northeast of the project area. Its elevations ranging from 240 m above mean sea level in the eastern part of the proposed project site to about 760 m above mean sea level in the western part of the proposed project site

c) Geology

According to the distribution **Map of Geological and Mining** in Negeri Kelantan, the perm and acid intrusives is dominated within this area. The perm often consists of phyllite, slate and shale with subordinate sandstone and shist. According to the analysis made with mineral map produces by **Department of Mineral & Geosciences**, it was noted that the proposed project site is identified as undifferentiated sedimentary and metamorphic rock area.



d) Soil

From the semi-detailed soil survey of Soil Suitability Report produced by the Kelantan Department of Agriculture, it consists of five (5) soil series which is Bungor Series, Kuala Brang Series, Kuah Series, Padang Besar Series and Steepland. A part of this soil types is also soil series being labelled as Steep Land which is represent area with a slope more than 30°.

Based on the calculation developed by DOA and DID, the average soil loss during the existing condition is about 0.39 mt/ha/yr and whereas the sediment yield is about 2.85 mt/ha/event.

e) River Systems And Drainage Patern

There are three main sub-tributary rivers was found in the proposed area which are tributary and sub-tributary of Sungai Kenong, Sungai Ayam and tributary of Sungai Kenren. It was noted that Sungai Ayam which is tributary of Sg. Bering and tributary & sub-tributary of Sg. Kenong within the project area will flow into Sungai Jenera. Tributary of Sg. Kenren will flow into Sg. Puian after that it will flow into Sungai Jenera.

It was noted that all stream and tributary within the project area will flow into Sungai Jenera after that it will flow to Sg. Nenggiri, Sg. Nenggiri to Sg. Galas and finally will discharge into Sg. Kelantan

f) Climate and Meteorology

In the absence of meteorology station in the vicinity of the proposed project



site, local meteorological data recorded at Kuala Krai Meteorological Station was used where all the meteorology data used was from Department of Meteorological Malaysia.

The summary of meteorological data is describes in Table 1.0.

Table 1.0 Meteorological Information Data at Kuala Krai Station

Parameter	Meteorological Information Data (2001 – 2014)
Mean Temperature	Highest : 28.4°C in May 2010 Lowest : 23.8°C in January 2009
Average Monthly Rainfall	Highest : 641.2 mm (December) Lowest : 100.4 mm (April)
Mean Humidity	Highest : 93.1% in December 2005 Lowest : 78.7% in February 2005

g) Ambient Air Quality

There are two (2) ambient air quality monitoring stations selected for the study. The parameter measured for air quality data is Total Suspended Particulate (TSP). The values of TSP for both stations are 42 µg/m³ and 83 µg/m³. The air quality results can be describes as good due to the existing condition of proposed project site as a forest area and far from any air quality-threatening activities.

h) Ambient Noise Level

Two (2) locations of ambient noise level monitoring stations were selected. The noise levels (Leq) in N1 and N2 was 56.2 dB (A) and 59.8 dB (A) during daytime, while 73.6 dB (A) and 61.9 dB (A) during night time respectively. This



high noise level might be due to the heavy raining especially during night time.

i) Water Quality

Five (5) water samples were collected within and outside the proposed project site. Based on the calculations of water quality index, the existing water quality at all stations were detected as clean and classified under Class I & II.

j) Water Intake

Information from JAKOA Negeri Kelantan & Terengganu also, the water supply was provided by **Kementerian Kemajuan Luar Bandar & Wilayah (KKLW)** currently supply water for 128 houses and three (3) 'tandak air' and one(1) water intake is used in supplying water for various Orang Asli settlements at Pos Pasik area. The water intake point which supplying water to Kg Pasik located at midstream of Sg. Jenera whist the three (3) 'tandak air' supplying water to Kg. Ayong, Kg. Perwel and Kg. Sugi.

4.0 EXISTING ENVIRONMENT: BIOLOGICAL SYSTEM

The flora and wildlife composites in the proposed project area were surveyed to assess the potential impacts of project implementation on the biological system. Field samplings were augmented by cross references with other surveys carried out in the nearby vicinity.

a) Flora

A preliminary survey for flora was carried out within the project site and the surrounding area for three days from 18 September 2015 – 20 September 2015.



Conservation status for all species recorded in the study area were assessed under IUCN Red List (internationally) and MPRL (Malaysia). However, these red lists cover most of the tree only and some of the non-tree. This due to lack of data gathered for non-tree and unfamiliar species tree. But most importantly, both of the lists were listed all Dipterocarps which was the most important and popular family in Malaysia. In summary, there are some differences in conservation status for plant listed in IUCN Red List and MPRL. This is due to the assessment parameters are varies among these two assessment and IUCN Red List was established based on international and globally whereas MPRL focused on locally (Malaysia) and their assessment was based on species community in Malaysia only.

b) Fauna and Wildlife

A preliminary survey of fauna and wildlife was carried out for three days and nights from 18 September 2015 – 20 September 2015 at the project site which is at Balah Forest Reserve. Methods of observation include direct sighting, vocalization (call, song etc.), markings (footmark, scratch on tree etc.) and faeces. Surveillance was carried out both during the day and night especially along streams where many species could be found. Due to rain sometimes, the hours that able to spend doing the observation was reduced resulting in lesser number of species recorded. Conservation status for wildlife is based on conservation status listed by IUCN Red List Categories 2010 and Protection Status under Wildlife Conservation Act, 2010.

5.0 EXISTING ENVIRONMENT: SOCIO ECONOMY

Based on “**Rancangan Tempatan Jajahan Gua Musang (RTJGM) 2020**” the proposed project site is located in Mukim Ulu Nenggiri, Daerah Bertam, Jajahan Gua Musang Kelantan and the nearest town is Gua Musang which is located about 23 km to the Southeast of the proposed project. The Mukim of Ulu Nenggiri and Daerah Bertam



are still rural and majority of her population survive on agriculture. In 2010, the total population for District of Bertam was about 23,141 people with 563 people (2.43%) residing in Mukim Kuala Sungai, 2322 people (10.03%) living in Mukim Limau Kasturi, and 20,256 people (87.53%) living in Mukim Ulu Nenggiri.

Based on information from **JAKOA Negeri Kelantan**, there is one (one) major Orang Asli settlements known as Orang Asli Pos Pasik located some 4.5 km northeast part of proposed project site. Pos Pasik consists of seven (7) small villages which is Kg. Pasik, Kg. Bering, Kg. Perwel, Kg. Simpang, Kg. Sugi, Kg. Ayong and Kg. Serai with 897 individuals from 180 families.

According to information gathered from **Department of Health (DOH) Negeri Kelantan**, about thirty three (33) cases of dengue for year 2015 (until October 2015) had been registered for the Jajahan Gua Musang. It was noted that more than 1000 cases of Malaria occurrence had been reported for District of Gua Musang starting 2007 until October 2015. Due to the increasing number of infectious diseases at this area, the mitigating measures must be taken for any development works in order to certain or prevent major outbreak on-site. Any symptom regarding to these cases need to be reported immediately to the nearest health care facilities or Department of Health itself.

6.0 POTENTIAL IMPACTS AND MITIGATION MEASURES DURING CONSTRUCTION PHASE

PROJECT ACTIVITY	SIGNIFICANT POTENTIAL IMPACT	MITIGATING MEASURES
<ul style="list-style-type: none"> • Land clearing activity • Site preparation 	<ul style="list-style-type: none"> • Land is exposed during land clearing process that increases the potential of soil 	<ul style="list-style-type: none"> • Scheduling and staging of the development. • Implementation of Soil Erosion and Sediment Control Measures (ESCP).



PROJECT ACTIVITY	SIGNIFICANT POTENTIAL IMPACT	MITIGATING MEASURES
<ul style="list-style-type: none"> Exposed soil before cover crop establishment 	<ul style="list-style-type: none"> erosion. Sedimentation process subsequently will affect the receiving river quality system and destroy the habitat of the river ecosystem. Increment in turbidity level, changes in colour and reduction in water visibility. Reduce the soil nutrients for the rubber forest trees. 	<ul style="list-style-type: none"> Minimize the disturb area and its duration of exposure. Construction of Terraces Biomass Management Cover Crops Establishment Paved or Gravel Access and Internal Road Runoff management Sediment Control Facilities Erosion Control Facilities
<p>Water Pollution</p> <ul style="list-style-type: none"> Land clearing activity Site Preparation 	<ul style="list-style-type: none"> Sedimentation <ul style="list-style-type: none"> Increase floods possibilities Aquatic life affected River water quality destruction Fertilizers, Pesticides and Agricultural 	<ul style="list-style-type: none"> Sedimentation <ul style="list-style-type: none"> Implementation of ESCP. ESCP tools must be inspected and maintained regularly. Land clearing and site preparation only on dry weather. Sediment collected must be disposed off at suitable areas.



PROJECT ACTIVITY	SIGNIFICANT POTENTIAL IMPACT	MITIGATING MEASURES
	<p>Chemicals</p> <ul style="list-style-type: none"> ○ Applying overdose the fertilizers cause adverse effects such as contamination in surface water. ○ Nitrogen from fertilizers is soluble in water and may enter streams through the surface or subsurface leaching if precaution is not taken. ○ Phosphorus in form of phosphate lead to the eutrophication 	<ul style="list-style-type: none"> ○ Maintain riparian reserve by native species. ○ Carry out the water quality monitoring program and audit program regularly. • Fertilizers, Pesticides and Agricultural Chemicals <ul style="list-style-type: none"> ○ Use fertilizers and agrochemicals following the prescribed dosage. ○ Plantation management must supervise the application of fertilizers. ○ Mulching, grow cover crops and intercrops to minimize weeds growth and maintain soil fertility. ○ Biological control used to control pest and disease. ○ The skid/storage shall be prepared following the required guideline. ○ Pesticides container, polybag and others



PROJECT ACTIVITY	SIGNIFICANT POTENTIAL IMPACT	MITIGATING MEASURES
	<p>on effect causing an excessive algae growth and preventing sunlight from reaching aquatic life in deeper water.</p> <ul style="list-style-type: none"> • Sewage <ul style="list-style-type: none"> ○ Potentially harmful to nearest river by lowering the water quality. ○ Impact to aquatic life. ○ Affect the human utilization. 	<p>should be recycled, reused or buried.</p> <ul style="list-style-type: none"> ○ Good management of storage of the chemicals used shall be adopted. <ul style="list-style-type: none"> • Sewage <ul style="list-style-type: none"> ○ Ensure the contractors provided a proper toilets and bathing facilities. ○ Project proponent needs to provide a proper operation of sewage treatment system. ○ A discharge of sewage through by-pass should be prohibited. ○ The project proponent and contractors shall comply with all regulations stipulated in Environmental Quality (Sewage) Regulations 2009.
<p>Waste Management</p> <ul style="list-style-type: none"> • Land 	<p>Biomass Waste</p> <ul style="list-style-type: none"> • Land clearing 	<ul style="list-style-type: none"> • Apply zero burning technique. • Signage “No Burning” shall be



PROJECT ACTIVITY	SIGNIFICANT POTENTIAL IMPACT	MITIGATING MEASURES
<p>clearing activity.</p> <ul style="list-style-type: none"> Site preparation. 	<p>could create a blockage of the natural system of drainage.</p> <ul style="list-style-type: none"> Burning of biomass could create health hazard and nuisance. <p>Scheduled Waste</p> <ul style="list-style-type: none"> Generation of oil and grease used by tractors and bulldozers. Improper storage and disposal will lead to ground contamination and water pollution. Contamination can cause toxicity to soil organisms. <p>Solid Wastes</p> <ul style="list-style-type: none"> Generation of degradable and un-degradable materials can cause pollution to environment. 	<p>erected at the suitable place.</p> <ul style="list-style-type: none"> Felled trees must be shredded and piled in between planting rows. Establish proper storage of scheduled wastes at designated area prior to disposal off-site by licensed contractor. The container must be labelled and monitor regularly. Provides garbage bins for the solid waste. Composting is recommended for handling the food waste. Workers are prohibited to throw the solid wastes into the river system. The solid waste collected must be disposed off at an approved landfill site. The scheduled waste collected must be disposed at the license premise. Contractor shall provide proper septic tank for sanitation. Sewage must be properly managed.



PROJECT ACTIVITY	SIGNIFICANT POTENTIAL IMPACT	MITIGATING MEASURES
<p>Air Pollution</p> <ul style="list-style-type: none"> Land clearing activity. Site preparation. 	<ul style="list-style-type: none"> The impact predicted to occur temporarily and in short term. Air pollutants emitted from exhaust of vehicles can pose significant risk to human health. 	<ul style="list-style-type: none"> Wash through must be constructed at the access point of project site. Washing equipment shall be installed. Vehicles speeds shall be limited Access road must be paved with crusher run or gravel Vehicles should be service and maintained regularly. Open burning is prohibited on the proposed project site. Project activity shall comply with the Environmental Quality (Clean Air Regulations) 2014. Where applicable, project proponent to adopt BMPs.
<p>Noise Pollution</p> <ul style="list-style-type: none"> Land clearing activity. Site preparation. 	<ul style="list-style-type: none"> Uses of machineries, equipment and the mechanical works will increase the ambient noise level in the proposed project site. However the impacts predicted 	<ul style="list-style-type: none"> Modifying existing old equipment with dumping materials and mufflers. Works should be limited to daytime. Vehicles and machineries shall be regularly serviced and maintained.



PROJECT ACTIVITY	SIGNIFICANT POTENTIAL IMPACT	MITIGATING MEASURES
	to occur in short term.	
<p>Flora & Fauna</p> <ul style="list-style-type: none"> Land clearing activity Site preparation 	<p>Flora</p> <ul style="list-style-type: none"> Removal of the soil cover will in turn destruct the vegetation and destroy the inhabitants. <p>Fauna</p> <p><u>Mammals</u></p> <ul style="list-style-type: none"> Land clearing activity will reduce the forest cover and increase the length of forest edge. Habitat-Fragmentation Human-wildlife Conflict & Food Shortage. 	<p>Flora</p> <ul style="list-style-type: none"> Land clearing shall be done in stages and phase. Vegetative cover on hilly area and steep slopes more than 30° should be preserved and maintained. Vegetative cover along the river and stream must be retained. Bare areas shall be stabilized and planted with cover crops. <p>Fauna</p> <p><u>Mammals</u></p> <p>Prohibition of Wildlife Poaching</p> <ul style="list-style-type: none"> Workers and local people are prohibited from wildlife poaching Provide warning posts 'No Hunting' at the approach and strategic locations along the access road to alert workers. Report illegal hunting or trapping of wildlife species to



PROJECT ACTIVITY	SIGNIFICANT POTENTIAL IMPACT	MITIGATING MEASURES
	<p><u>Avifauna</u></p> <ul style="list-style-type: none"> • Loss of habitat, food source, socializing venue and focal point. • Increase chances of illegal bird trapping; • Noise emitted which either directly or indirectly cause disturbance to existing birds. 	<p>the enforcement authority.</p> <p>Phasing/Directional Clearing</p> <ul style="list-style-type: none"> • Site clearing should start from forest edge towards forested area. • Wildlife shall be allowed to move from working area to adjacent forest. <p>Wildlife-human Conflict Management Strategies</p> <ul style="list-style-type: none"> • Construction of ditch and electric fencing • Contingency plan shall be prepared and consults with the DWNP. • The boundary of the plantation area near the forest edge shall be properly managed. <p><u>Avifauna</u></p> <ul style="list-style-type: none"> • Incident Reporting. • Signage on Prohibition of Wildlife Hunting or Trapping. • Use silencer at the vehicles and machineries. • Monitoring and Auditing Program



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<p>Flood</p> <ul style="list-style-type: none"> • Land clearing activity. • Site preparation • Field maintenance • Harvesting 	<ul style="list-style-type: none"> • Land clearing will decrease the rain interception and surface retention of rain water. • Improper management of biomass will cause the clogging of drainage system. • Unsuitable drainage design will contribute to the overflow issues. • Hydrological modelling was used to analyze the hydrologic and hydraulic behaviour and to simulate the impact of future development to the flooding problem. • However there are other factors which may contribute to the 	<ul style="list-style-type: none"> • Establishment of silt pit and natural cover. • Installation of silt trap, temporary earth drain and check dam. • Maintained the drains and culvert. • Designed of the drainage must practical to cater the volume of water. • Adopt proper management practices. • Provide enough storage volume within the ponds. • The proposed project site is advisable to be protected with bund to cater for the increase of storm flow from the plantation area.



PROJECT ACTIVITY	SIGNIFICANT POTENTIAL IMPACT	MITIGATING MEASURES
	<p>flood at the downstream of the proposed project.</p>	
<p>Socio Economy</p>	<p>Job Opportunities</p> <ul style="list-style-type: none"> The proposed project expected to generate employment opportunities to the local and foreign workers. <p>Foreign workers</p> <ul style="list-style-type: none"> There are possibilities that the foreign workers would cause some social conflicts. <p>Access Road</p> <ul style="list-style-type: none"> The project development is predicted to cause road damage, and raise dirt and dust. Sharing the same access road with the villagers, create potential noise annoyance 	<p>Job Opportunities</p> <ul style="list-style-type: none"> Project proponent should advertise the job offer to the community.



PROJECT ACTIVITY	SIGNIFICANT POTENTIAL IMPACT	MITIGATING MEASURES
	<p>and also air pollution.</p> <p>Human-wildlife Conflict</p> <ul style="list-style-type: none"> Wildlife encroachment during the project development can cause hazard to the nearby villagers and workers. 	<p>Management of Wildlife</p> <ul style="list-style-type: none"> Consult and reports any issues and wildlife conflict encounter with the Department of Wildlife and National Parks (DWNP) Kelantan.
<p>Health & Disease</p>	<ul style="list-style-type: none"> Disturbance in mosquito ecology may affect the human health such as malaria which commonly occurred. Malaria is a disease caused by the Plasmodium Parasite. Disease spread by the bite of an parasites (called sporozoites) infected of 	<ul style="list-style-type: none"> Health screenings must be carried out, including for local workers, to prevent those who are infected with infectious disease from working at the proposed project site. All employees must undergo scheduled health screenings project proponent needs to provide adequate basic facilities and utility (potable or



PROJECT ACTIVITY	SIGNIFICANT POTENTIAL IMPACT	MITIGATING MEASURES
	<p>Anopheles mosquito</p> <ul style="list-style-type: none"> Water contaminated waste product by animal known as leptospirosis. 	<p>clean water, mosquito netting (treated net) and basic hygiene amenities) for employees staying at the ‘kongsi’ houses at the proposed project site.</p> <ul style="list-style-type: none"> The project proponent should refer to the nearest Department of Health (Gua Musang) at the CDC or Vector Unit for gaining information on the malaria disease, the preventive medicine and the surrounding area that has been identified after an outbreak of malaria Avoid areas of stagnant water, especially in tropical climates. If proposed project site exposed to a high risk area, taking doxycycline or amoxicillin may decrease the risk at developing this disease. A domestic waste



PROJECT ACTIVITY	SIGNIFICANT POTENTIAL IMPACT	MITIGATING MEASURES
		disposal system is capable of ensuring proper disposal, prevention of scavenging by rodents and other scavenging.

7.0 POTENTIAL IMPACTS & MITIGATION MEASURES DURING OPERATION PHASE

ACTIVITY OPERATIONAL PHASE	SIGNIFICANT ENVIRONMENTAL IMPACT	MITIGATING MEASURES
Soil Erosion	<ul style="list-style-type: none"> • In early stages of the operations phase, earth movements such as slope failure, collapse of terraces on steep slopes, etc. could occur and result in erosion and sedimentation problems. • Uncovered land • Soil erosion and sedimentation 	<ul style="list-style-type: none"> • Terraces, ground cover and silt pits along the roads and in the fields where erosion is likely happen shall be maintained regularly. Re-planting ground cover at the barren area is recommended to prevent soil erosion. • Maintain riparian reserves along watercourses populated by native species as buffers to trap eroded material from being carried away by runoff to enter the water bodies. Plant native



ACTIVITY OPERATIONAL PHASE	SIGNIFICANT ENVIRONMENTAL IMPACT	MITIGATING MEASURES
		<p>species where they are absent.</p> <ul style="list-style-type: none"> • The ESCP tools shall be maintained regularly. • The sediments trap shall be excavated and deposited to suitable area. • Maintained riparian reserves along watercourses; • Apply pruned fronds and Empty Fruit Bunches (EFB) as mulching material. • Stacked the pruned fronds across slopes. • Planting leguminous crop to cover the expose area.
Waste Management	<ul style="list-style-type: none"> • Solid waste <ul style="list-style-type: none"> ◦ Solid waste will be generated by the workers. • Biomass waste <ul style="list-style-type: none"> ◦ Vegetative waste from the field maintenance activity. • Scheduled waste <ul style="list-style-type: none"> ◦ Heavy vehicles and machinery will emit the lubrication oil. 	<ul style="list-style-type: none"> • Zero burning method will be established on the proposed project site. • Appropriate containers and waste bins should be provided at appropriate places. • The contractors shall notify the workers not to burn the solid waste. • Scheduled waste must be prohibited from being thrown into the rivers.



ACTIVITY OPERATIONAL PHASE	SIGNIFICANT ENVIRONMENTAL IMPACT	MITIGATING MEASURES
	<ul style="list-style-type: none"> • Sewage. <ul style="list-style-type: none"> ◦ Improper treatment of sewage will result in elevated COD, BOD and microbiological contents of the waterways. 	<ul style="list-style-type: none"> • A proper container must be selected to store the scheduled waste. • The containers shall label properly according to the type of waste. • The scheduled waste shall be disposed at the license premise. • Remaining fertilizer and chemical container need to clean before they are disposed. • The sewerage system provided during the construction phase shall be maintained regularly. • All component of the sewage treatment system must be ensuring in a good working condition at all time.
Water Pollution	<ul style="list-style-type: none"> • Overuse of agrochemicals and fertilizers can result in water pollution and groundwater contamination. • Poor maintenance of silt trap will contribute to 	<ul style="list-style-type: none"> • A proper storage facility must be built to store agrochemicals and fertilizers. • All manuring process must be scheduled and avoided during wet weather and rainy days.



ACTIVITY OPERATIONAL PHASE	SIGNIFICANT ENVIRONMENTAL IMPACT	MITIGATING MEASURES
	sedimentation.	<ul style="list-style-type: none"> • Silt traps shall be well maintained • Circle weeding should be practices for weedicides controls. • Chemicals application only when the outbreak severe.
Air Quality & Noise	<ul style="list-style-type: none"> • Movement of vehicles and machinery during estate maintenance is reduced and dust dispersion and noise emission will not be significant. 	<ul style="list-style-type: none"> • Keeping a boundary of trees, if chemical pesticides must be used. • Workers involved in spraying activities must be equipped with appropriate protective gears. • Workers must be instructed on the proper spraying procedure. • Chemicals used must be registered under Pesticides Act 1974. • The schedule of spraying must be monitored closely. • Biological control measures shall be adopted whenever possible.
Flora and Fauna	<p>Flora</p> <ul style="list-style-type: none"> • No significant impact on fauna during operational 	<p>Flora</p> <ul style="list-style-type: none"> • No specific control measures suggested.



ACTIVITY OPERATIONAL PHASE	SIGNIFICANT ENVIRONMENTAL IMPACT	MITIGATING MEASURES
	<p>phase.</p> <p>Fauna</p> <ul style="list-style-type: none"> • There will be a minor loss of the less mobile animal, especially reptiles during the land clearing phase carried out. • Accessibility and visibility of poachers will ultimately increase the bird hunting and trapping because they can easily get access to the certain places towards the forest area. • Wildlife-Human conflict due to insufficient food sources might trigger them to seek food in nearby estate or villages. 	<p>Fauna</p> <p>Prohibition of Wildlife Poaching and Trapping</p> <ul style="list-style-type: none"> • Warning post shall be placed at suitable location. • A guard patrol shall be held 24 hours. • Information of illegal hunting shall be reported to DWNP. <p>Maintenance of Ditch and Electric Fence</p> <ul style="list-style-type: none"> • Animal ditch and electric fence at the perimeter shall be maintained. <p>Encourage Bird Diversity</p> <ul style="list-style-type: none"> • Plant native flowering and fruit-bearing trees. • Allow unplanted area such as steep land to remain or revert to natural state. • Improve water quality in waterways. • Apply moderate or reduce agrochemicals use.



ACTIVITY OPERATIONAL PHASE	SIGNIFICANT ENVIRONMENTAL IMPACT	MITIGATING MEASURES
Socio Economic	<p>Positive impact on employment opportunities</p> <ul style="list-style-type: none"> • Regional economic-contribute to the national income and regional economy. • Employment opportunities. 	
Abandonment & Rehabilitation	<ul style="list-style-type: none"> • Project abandonment can occur at any stage of the project, which may due to the down turn of the nation's economy, social acceptability of the project in the community, or unforeseen management and technical problems. 	<ul style="list-style-type: none"> • Project proponent must endeavour to vacant the project site in an environmentally responsible manner and prepare a Project Abandonment Plan for the main stages of development. • All abandoned sites must be properly fenced off. • Installed warning signs to prevent unauthorized entry. • All vehicles involved in the project development must be taken out of the sites. • All environmental control measures must be initiated. • Provide regular inspection of the sites and take necessary measures to ensure their sanctity.



8.0 RESIDUAL IMPACTS

Despite the mitigation measures suggested against soil erosion, sediment pollution and contamination of water by runoffs, some forms of water pollution may still occur due to carelessness and negligence, unforeseen circumstance or beyond the control of the oil palm plantation management. The water quality of natural water bodies in and adjacent to the project site may therefore be degraded. The significance of these residual impacts would partially depend on the degree of compliance by the initiator to the mitigation measures proposed.

Impacts due to localized loss of flora and fauna during the plantation stages would not be significant because the species detected within the proposed site could be found in similar habitats elsewhere in Malaysia. However, zero burning shall be practiced to minimize such impacts. If all the suggested measures were incorporated into the development plan, residual impacts as mentioned above would be minor and less threatening.

9.0 ENVIRONMENTAL MANAGEMENT PLAN (EMP)

Issues identified to have a significant impacts and may arise along the entire development could be addressed by the Environmental Management Plan (EMP). The EMP has been designed to ensure appropriate measures are taken to handle significant impact issues that most likely to arise throughout the whole development stages. In order to achieve the EMP target, thus the environmental specifications or recommendations are made.

It comprises a structured plan for the mitigation measures of predicted environmental impacts, Environmental Monitoring Program, Environmental Audit and remedial action. To ensure that control measures are implemented effectively in terms of time and place, the EMP can be developed in conjunction with the planning and coordination of construction work. The EMP will be applicable to all the labour and site office staff who works in the project site.



10.0 CONCLUSION

This EIA supported by relevant analysis addressed specifically in every aspect possible. The component of the EIA study, inclusive the aspects of water quality, ambient air quality, ambient noise, flora and fauna and the respected socio economy analysis. Both positive and negative effects to the environment can be seen as a result of this various project activities during the land clearing, field establishment, field maintenance and harvesting.

In conclusion, the proposed project may possess more beneficial impact notably in a period of a long term. From the EIA study, most of the potential environmental impact and adverse impact highlighted can be controlled and minimized. The proposed project development shall be coordinate and in line with the mitigating measures formulated prior to the protection of the ecosystem and raising the social acceptability. In the means of sustainable development, the proposed project development activity can be held with a thorough and strict monitoring and supervision.