SECTION 6

POTENTIAL IMPACTS ON THE ENVIRONMENT

6.1 POTENTIAL ENVIRONMENTAL IMPACTS

Based on the preliminary evaluation of the baseline conditions of the Project site described earlier, qualitative assessments of the various potential impacts are described below.

6.1.1 Development Phase

Water Quality: It has been identified above that various waterbodies and water intakes are present in the vicinity of the Project site. The key source of water pollution from the project development may include surface runoff, construction wastewater and sewage discharges to the nearby watercourses. If uncontrolled, the impact on the water quality could be significant and long lasting, which inevitably may affect the livelihood of the social activities nearby. In view of the potential severity to the environment, this impact is considered as "***significant***".

Hydrology: The project development may alter a large tract of land and alter some sections of the existing watercourses that traverse through the existing site. Additionally, uncontrolled erosion and sediment discharge to these streams and rivers may also affect their hydraulic characteristics and river morphologies, and possibly even the flood risk of the surrounding plateaus. In this regard, this impact is considered as "***significant***".

Erosion risk: Erosion risk due to poor development practice during land clearing and surface works is likely for this Project due to the large area that needs to be cleared for the plantation. If uncontrolled, erosion and sediment runoff to the nearby rivers may cause long term and adverse impacts to the river hydraulic. In this regard, this impact is considered as "***significant***".

Ecology: Extensive land clearing required for this development may have a long term impact to the fauna and flora and also wildlife which currently uses the site as their habitats. In this regard, this impact is considered as "***significant***".

Waste Management: Potential waste materials generally may include inert excavated materials, organic materials such as felled trees, general domestic refuse, and scheduled wastes arising from equipment. With the proper implementation of waste management

practices, this impact can be mitigated to an acceptable limit. As such, this impact is considered as "***significant***".

Flood risk: As implied from the above, this impact is considered as "**less significant**".

Air Quality: It is anticipated that certain project activities such as land clearing, use of heavy duty construction equipment and machineries, stockpiling of dusty materials, unpaved construction roads, etc. may result in some air-borne pollutions such as dust and fumes that may impact some of the nearby sensitive receptors. However, this impact is considered short term and temporary, and with good site management practices and mitigation measures, this impact should be controlled to an acceptable limit. As such, the potential impact to air quality is considered as "***less significant***".

Noise: Similarly to air pollution, it is anticipated that certain project activities such as land clearing, use of heavy duty construction equipment and machineries, breaking of hard surfaces, etc. may result in some noise pollution that may impact some of the nearby sensitive receptors. However, this impact is also considered short term and temporary, and with good site management practices and mitigation measures, this impact should be controlled to an acceptable limit. As such, the potential impact to noise is considered as "***less significant***".

Groundwater and Hydrogeology: This Project is not anticipate to involve deep excavation that may cause pollution to the groundwater source. As such, this impact is considered as "***less significant***".

Socio-economy: Except for the short term construction disturbances, this Project will bring long term economic and social benefits to the communities in the vicinity of the site. As such, this impact is considered as "***less significant***".

Cultural Heritage: No significant or large volume of cultural heritage is expected to be found on this site. As such, this impact is considered as "***less significant***".

Land Contamination: This development will not involve the use of potential hazardous materials. Additionally, the site has not been previously used for activities that may result in the potential contamination of the site. As such, this impact is considered as "***less significant***".

Landuse, Landscape and Visual: The land use of the development will be changed to oil palm plantation, similar to its surrounding land uses. The land use change of the surrounding

plantations have shown insignificant impacts. As such, this impact is considered as "***less significant***".

Traffic: This site is not generally open to public traffic, except for the short term construction traffic. With appropriate traffic management measures where required, this impact is considered as "***less significant***".

Hazards and Risk Assessment: Due to the nature of the Project which is largely plantation development, this aspect is also considered as "***less significant***".

Geology: This site does not involve any excavation of earth surface that will change geological characteristic of the area. As such, this impact is considered as "***less significant***".

6.1.2 Operation Phase

Human Wildlife Conflicts: There would be an encroachment of wildlife on and off to the plantation area. The project proponent and the Wildlife Department shall work together to ensure the conflict is minimized. As such, this impact is considered as "***less significant***".

Erosion Risk: During the operations phase, the soil has been fully stabilized due to the existence of the cover crops; in addition, the oil palm trees would have been established which will reduce the soil surface from the natural erosion agent i.e. precipitation. Hence, the impact of soil erosion during this stage is minimizing. As such, this impact is considered as "***less significant***".

Hydrology: During operation phase, hydrology would not be a significant factor as the cover crops, drainage and oil palm trees are already established. As such, this impact is considered as "***less significant***".

Water Quality: The cover crops and oil palm trees is established during operation phase whilst fixed dosage of fertilizer and minimal usage of herbicides will be an advantage to minimize the impact of on water. As such, this impact is considered as "***less significant***".

Air Quality: Harvesting will normally commence within two (2) to three (3) years after field planting. The movement of vehicles and machinery during estate maintenance is reduced so dust dispersion will not be significant. Spraying of agrochemicals in controlling weeds, pests and diseases could introduce chemical pollutants into the air in the form of spray droplets suspended in the air and swept away by winds. Again, this source of atmospheric pollution is

temporary in nature and can be easily minimized with proper control measures. As such, this impact is considered as "***less significant***".

Noise: Once the plantation area is in operation phase, the movement of vehicles and machinery during estate maintenance is reduced. Thus, noise pollution and noise annoyance is relatively insignificant and within the control range as compared to the standard requirements. As such, this impact is considered as "***less significant***".

Ecology: *T*here would be no significant impact on flora as the cover crop and oil palm trees are established whilst the availability of food would eventually attract wildlife especially wild boar to enter the area. In this regard, this impact is considered "***less significant***".

Socio Economy: This Project will bring long term economic of employment opportunities and social benefits to the communities. As such, this impact is considered as "***less significant***".
Flood risk: As implied from the above, this impact is considered as "***less significant***".

Waste Management: The waste generation will not be as much compared with during the development phase. Thus, the biomass needs a best management practice to avoid the blockage to the natural stream and drainage nearby in both phases. In addition, there will be a scheduled wastes of lubricant oil, diesel grease, solid wastes and sewage generated during maintenance. A proper waste management practices need to be implemented to prevent pollution to the environment. In this regard, this impact is considered "***less significant***".

Land Contamination: This development will not involve the use of potential hazardous materials. Additionally, the site has not been previously used for activities that may result in the potential contamination of the site. As such, this impact is considered as "***less significant***".

Landuse, Landscape and Visual: This development is compatible with the surrounding land uses and hence it is not expected there will be significant impact on this aspect. As such, this impact is considered as "***less significant***".

Hazards and Risk Assessment: Due to the nature of the Project which is largely plantation development, this aspect is also considered as "***less significant***".

Geology: This site does not involve any excavation of earth surface that will change geological characteristic of the area. As such, this impact is considered as "***less significant"***.

Traffic: This site is generally not open to public traffic, except during the transportation of fruit bunches. With appropriate traffic management measures where required, this impact is considered as "***less significant***".

6.2 BASIS ASSESSMENT MATRIX

The assessment of potential impacts is based on the project activities as outlined. Each activity is examined using the methods that will be employed together with the work schedule. Potential and significant impacts are identified, analysed and appropriate mitigation measures recommended.

There will be some alteration of the land forms in the project site. All the activities must be performed during the relatively dry season (February - October).

Table 6.2.1 shows the matrix of the major development activities and the critical issues identified which are discussed further in subsequent paragraphs. All the impacts from the project activities are significant but manageable.

Table 6.2.1: Basis Assessment Matrix

Key

Insignificant and excluded from matrix

± Environmental impact that is potentially but on a temporary basis and will assume equilibrium after certain period of time

X Environmental impact that is potentially significant but about which there is insufficient data to make a reliable prediction. Close monitoring and control are recommended

√ Potentially significant adverse environmental impact for which a design solution has been identified

* Residual and significant adverse environmental impact

Ø Significant environmental enhancement

				Project Activities														
				Site Investigation			Construction							Operation and Maintenance				
				Survey	Investigation	Land Acquisition	Access Road	Site Clearing	Excavation	Drainage	Erosion Control	Utilities	Abandonment	Equipment Operation	Waste Disposal and Recovery	Product Storage	Spill and Leakage	Abandonment Plan
	Identification of Activities																	
Environmental Component	Physicochemical	Land	Landforms				√			√								
			Soil Profile															
			Soil Compaction				√			±	X							
			Slope Stability															
			Subsidence and Compaction															
			Seismicity															
			Flood Plains / Swamps															
			Land Use															
			Engineering and Mineral Resources															
			Buffer Zones															
		Surface Water	Shore Line															
			Bottom Interface															
			Flow Variation															
			Water Quality				X			±	X							
			Drainage Pattern							√								
			Water Balance															
			Flooding															
			Existing Use															
		Ground Water	Water Table															
			Flow Regime															
			Water Quality															
			Recharge															
			Aquifer Characteristics															
			Existing Use															
		Atmosphere	Air Quality				√											
			Air Flow															
			Climatic Changes															
			Visibility				√											
		Noise	Intensity				√											
			Duration															
			Frequency															
	Biological	Species and Population	Terrestrial Vegetation				Ø											
			Terrestrial Wildlife				Ø											
			Other Terrestrial Fauna				Ø											
			Aquatic / Marine Flora															
			Fish															
			Other Aquatic / Marine Fauna															
			Marine Habitats															
			Marine Communities															
	Human	Health and Safety	Physical Safety				±					-						
			Psychological Well-Being															
			Parasitic Disease															
			Communicable Disease															
			Physiological Disease															
		Social and Economic	Employment									X						
			Housing															
			Education															
			Utilities															
			Amenities															
			Property & Settlement															
		Aesthetic and Cultural	Landforms															
			Biota															
			Wilderness															
			Water Quality															
			Atmospheric Quality															
			Climate															
			Tranquillity															
			Sense of Community															
			Community Structure															