

EXECUTIVE SUMMARY

1.0 TITLE OF PROJECT

This **Preliminary Environmental Impact Assessment (PEIA)** report has been prepared for the **Proposed Housing and Commercial Area** on existing rubber plantation estate by Tetuan TTPT Sdn Bhd. The project covers an area of about 203.07 acres (82.18 Ha). The components include residential units (terrace, semi-detached and bungalows), office building, hypermarket, gas station, infrastructure and various facilities.

2.0 PROJECT NEED

In the Ninth Malaysian Plan, the development of the housing sector will continue to focus on the provision of an adequate, affordable and quality houses for all Malaysians. The private sector will undertake the lead role while the public sector will provide the necessary support and regulatory measures to ensure efficiency.

During the plan period, requirement for new houses is expected to be about 709,400 units, of which 38.2 per cent will be a combination of low and low-medium cost houses as well as houses for the poor while, 61.8 per cent in the category of medium and high cost houses.

To improve the quality of life of the urban population, the provision of urban services will focus on expanding the scope of coverage of the local authorities, creating a safe living environment, increasing people participation as well as ensuring sustainable urban planning and development.

3.0 PROJECT OPTIONS

The development options of the lot is assessed based on the designated land use according to the Majlis Perbandaran Selayang Structure Plan 1995-2012 where options for the proposed development of project site are described next page:

- i. No-development option and the area will be maintained in its existing condition (rubber-estate).
- ii. Housing and Commercial Area.

From the assessment of the available options, the option for housing and commercial area is deemed the most suitable for the lot concerned and consistent with the Local Structure Plan for the area.

4.0 PROJECT DESCRIPTION

The proposed housing and commercial area are located on an existing rubber estate, at Bukit Serai, Mukim Rawang, Daerah Gombak, Selangor Darul Ehsan covering an area about 203.07 acres. The project site is currently accessible via state road B29 (Jalan Kg. Sg. Serai) which connected Rawang – Kuang. This state road joined to another state road B27 (Jalan Batu Arang) that connected to the North – South Highway (E1).

5.0 EXISTING ENVIRONMENT

5.1.1 Physical Characteristics

The proposed development area is part of an existing rubber plantation area. The highest peak approximately 128.92 m (422.97 ft.) is located at the north-western section of the project site.

The general drainage system of the project area and its surrounding can be characterised as dendritic (tree-like). The nearest stream is Sg. Pechah Mangkuk spreading from the north-west to south-east. The river flows orientation begins with Sg. Pechah Mangkuk will meet with Sg. Serai which flow to the south, then join with Sg. Kuang on the south-east and finally flow to Sg. Kundang at the west.

5.1.2 Geology And Soils

The proposed development area is underlain mainly by of silty clay with traces of laterite gravels. Soil types at the project area are defined by the Serdang-Bungor-Munchong and Mined Land.

5.2 METEOROLOGY

The project area which is in the equatorial region experiences relatively uniform warm and humid conditions with sunshine all year round. The highest amount of rainfall (1997 – 2006) was collected in the month of December with 602.7 mm. The annual mean temperature is relatively uniform averaging about 27.2 – 28.5 °C. The predominant wind direction is from north and northwest occurring about 13.3% and 14.2% of the time respectively.

5.3 AIR QUALITY

The results of air quality monitoring are found to be good and within the Malaysian Recommended Air Quality Standard Guidelines.

5.4 NOISE

Generally, the noise level obtained at point A1 during daytime showed 48% of the LAeq readings were higher than the maximum permissible sound level of 55 dBA as stated under Schedule 1 in Annex under the Planning Guidelines for Environmental Noise Limits and Control for Suburban Residential Area. As for location N2, only 1 out of 60 LAeq reading recorded during day time was higher than the said limit.

5.5 HYDROLOGY AND WATER QUALITY

5.5.1 Hydrology

The nearest river network in the vicinity of the project site is Sg. Pechah Mangkuk. This river flow and connected to Sg. Serai, approximately 2 km south-eastern from project site. Sg. Pechah Mangkuk will meet with Sg. Serai to join Sg. Kuang and finally Sg Kuang will flow into Sg. Kundang. The hydrological system of the area in relation to the project site is shown in **Figure 8.6.1**. There is a water intake point downstream namely Rantau Panjang WTP which is located approximately 17 km (cross section) from the project site as shown in **Figure 8.6.2**.

5.5.2 Water Quality

The water quality index for all the Points fall within Class II except for Sg. Kuang (Points W7 & W8) which was Class III. The results for all the important parameters for Points W1 and W4 complied with Class IIB, INWQS. However, DO reading in samples W5 (4.82 mg/l), W6 (4.70 mg/l), W7 (4.03 mg/l) and W8 (4.12 mg/l) were below the said limit range. The BOD [Point W7 (6 mg/l) & Point W8 (5 mg/l)], COD [Point W7 (36 mg/l) & Point W8 (31 mg/l)], TSS [Point W7 (588 mg/l) & Point W8 (676 mg/l)], Ammonical Nitrogen for W7 (1.6 mg/l) and W8 (1.4 mg/l) and *E.coli* counts [Point W2 & W3 (500 counts/ml), W5 & W6 (800 counts/ml), W7 (21,000 counts/ml) & W8 (24,700 counts/ml) were higher than the Class IIB, INWQS limits.

5.6 LANDUSE

The project site area is currently a rubber plantation estate. The main land use within the 1-3 km radius is residential and agricultural areas shown in **Figure 8.7.1** and **Figure 8.7.2**.

5.7 UTILITIES

The nearest substation to the area is provided by Tenaga Nasional Berhad (TNB) which has a capacity of 11kV. Meanwhile, the water supply source for the area is distributed by Syarikat Bekalan Air Selangor (SYABAS). Telecommunication system is supplied by Telekom Malaysia Berhad (TM).

The solid waste collection for the area surrounding the project area is under the jurisdiction of the Majlis Perbandaran Selayang (MPS). All municipal solid waste within the MPS is disposed at the Bukit Tagar Sanitary Landfill.

5.8 SOCIO-ECONOMY

The population of Mukim Rawang stood at 116,340 persons in 2000. Using the same average rate of population growth, the estimated population of the mukim in 2008 is 159,219 persons. Of these, Malays is the single largest ethnic group accounting for 42.7% of the total population followed by Chinese at 34.5%, Indian (21.5%) and Others (1.3%).

6.0 ENVIRONMENTAL IMPACTS AND MITIGATING MEASURES

6.1 SOIL EROSION IMPACT

The existing erosion rate of the entire proposed development area is calculated to be about 15,759 tonnes/year. Potential erosion is the highest during the 37th to 45th month, where land clearing of Sub-phase 4 commences. Sub-phase 4 comprises the 3rd largest area (16.84%) relative to the other phases. The total soil loss of 201,450 tonnes/year involves a 13-fold increase from the existing environment.

Mitigation measures to be undertaken to address soil erosion such as allocation of retention ponds, silt traps/silt fences, temporary slope protection measures, maintenance of the drainage system, maintenance of silt traps and retention ponds, maintenance of unpaved internal roads, construction of interceptor berm drains and bench drains and planting of grass were proposed to be incorporated into the project development phase.

6.2 DRAINAGE AND FLOOD

Flooding within the project site has not been encountered, and is not anticipated, but could occur in downstream or adjacent low lying areas. Therefore, the design of the proposed drainage system should ensure the run-off of the post development stage is equal to the pre-development stage.

A drainage system that will adopt a composite system of conveyance and storage elements were proposed to be the mitigation measures.

6.3 WATER POLLUTION

From the analysis it shows that the organic pollutants (as indicated by BOD and COD) tend to have an impact on the downstream river water quality (at W8 which is 2km from the zero point) mainly due to poor rate of decomposition as the average level of DO is low (4.54 mg/l).

Unlike the behaviour of BOD and COD, TSS and NH₃-N predicted not to have a significant impact on the downstream area (at W8) due to efficient dilution factor and dissolution of nitrogenous compound respectively.

6.4 AIR POLLUTION

Air pollution due to dust is expected to be generated during the construction phase of the project, during the clearing of the project area and any other earthworks operations required for the construction of the housing development including access and internal roads. Predicts the air pollutant concentrations in ambient air resulting from emissions from the mixed development project at Bukit Serai, Mukim Rawang, Daerah Gombak, Selangor Darul Ehsan and interprets the modelling predictions.

6.4.1 Air Pollution During Construction Phase

Stockpiles of topsoil, uncovered loads on construction vehicles and unprotected cleared areas are potential dust sources. In addition, dust could be generated during unsealed road used by construction traffic. Dust emissions often vary substantially from day to day, depending on the level of activity, the specific operations and the prevailing meteorological conditions.

6.4.2 Operation Phase of Completed Mixed Development Area

Insignificant air quality impact is expected from the completed mixed development as there are no significant sources of dust or air pollutants in a mixed development as most of the area is residential and commercial. The main sources of air pollution in a completed mixed development project are motor vehicles but as the area are developed as medium-density residential and commercial, the sources are considered insignificant.

6.4.3 Mitigating Air Pollution During Construction

The potential for dust from earthworks operations during construction is assumed to be low and the impacts local.

Mitigating measures recommended during project development are:

- i. soil loads on construction vehicles will be kept covered during transit on public roads;
- ii. topsoil stockpiles will be kept covered or have a suitable dust palliative applied;
- iii. a suitable dust palliative should be applied to unsealed roads if dust rises above acceptable levels; and
- iv. dust deposition monitoring should be conducted during the construction phase.

6.5 NOISE IMPACT

The impact of noise on the environment by this project was assessed only for the construction phase of the project as the impact is significant while noise impact on completion of the project is negligible as it is mainly low to medium density suburban residential and commercial with parks and recreational areas.

The construction phase of the Bukit Serai housing will have an impact on noise levels in the surrounding areas especially to the nearest environment sensitive receptor namely Kg. Sg. Serai. There are significant noise sources especially when there is piling work and rock breaking but this is temporary and transient and occur mainly during the daytime as construction activities are only allowed during the daytime. Therefore, the impact if any will also be temporary and transient.

In cases where there are receptors that are subjected to noise impact, then to mitigate the impact, the following mitigation measures are recommended;

- i. restrict timing of construction activities that generate high noise levels such as piling and rock breaking to certain hours of the day;
- ii. the usual noise mitigation actions such as exhaust mufflers, regularly serviced vehicles and speed reduction will reduce the noise impact as well;
- iii. set the limit for noise emitted by vehicles, machinery and pumps will mitigate the impact of noise during construction of the project;
- iv. consultation with parties that are affected by the noise is a good practice by the project proponent; and

- v. noise monitoring during the construction phase to determine compliance with statutory criteria and initiate additional mitigation measures if required.

6.6 LAND USE IMPACT

Generally, from the point of view of land use compatibility, there is no conflict between the proposed development area and the surrounding which are agricultural plantation and residential areas within the 1km radius. Noise is not an issue since the impact of noise generated by the project during the construction phase is expected to be negligible as the noise generated is manageable and containable.

Based on the results of the air and water modelling exercises, impacts arising from air and water pollution are less likely to be felt in areas that lie within the 1-3 km radius.

The recommended mitigation to be considered is to manage all activities which contribute to noise and dust deposition during construction period. Air and noise monitoring also should be carried out to determine compliance with statutory criteria and initiate additional mitigation measures if required.

6.7 MANAGEMENT OF BIOMASS MATERIALS

Biomass wastes at the proposed project area are contributed mainly by rubber trunks and stumps. Rubber trunks will be sold while, stumps will be left to rot.

6.8 SOCIO-ECONOMY

6.8.1 Site Clearing, Earthworks and Construction of Civil Structures

Potential Impacts

Most of the activities may involve the utilization of heavy machinery to clear the site, prepare the ground to pre-determined platform level and construct the civil structures. Workers involved in these activities shall be exposed to the potential danger of industrial accidents either from faulty equipment and machinery, or from negligence which may lead to bodily injuries and decapitation.

The socio-economic survey uncovers that the local communities are concern with air pollution from airborne dust during construction activities. This is especially pertinent to residents of Taman Kundang Jaya, located about 0.5 km away from the project site.

Mitigating Measures

Physical injuries to workers could be avoided if the contractors are responsible in ensuring that their vehicles and machineries are well maintained, road worthy and not faulty. Workers ought to observe safety first and be highly disciplined.

Workers should be properly attired using P.P.E (Personal Protective Equipment) and follow safe working procedures to minimise occupational injuries.

Dust pollution can be minimized by regular water spraying of the exposed ground, re-turfing of exposed ground and executing the earthwork in stages to minimize the size of area that can become source of airborne dust.

6.8.2 Establishment of Base Camps

Potential Impacts

Overcrowded and cramped base camps would be uncomfortable to workers and expose them to contagious diseases. Poorly maintained toilets and disposal of garbage could generate unpleasant smells and make the camps site dirty, unhealthy and uncomfortable for living, if they are not properly maintained.

Mitigating Measures

The base camp will need to be self-contained and provided with proper basic facilities (water and electric supply). Systematic and properly supervised garbage collection and disposal services should be established in the camp area to generate hygienic living. Adequate space should be provided in the camp to avoid overcrowding. In order to control the spread of diseases, all workers must be subjected to regular medical check-ups.

6.8.3 Transportation of Construction Materials and Equipments

Potential Impacts

Land traffic will increase due to movements of construction vehicles carrying equipment, materials and workers to the construction site by passing through the main road (State Roads B29 and B27) and settlements (including Taman Kundang Jaya, Kg Batu Dua Puluh, part of Kg Sungai Serai and Kuang). The slow moving trucks and the entry/exit into the project site can increase the likelihood of accidents. The vehicles can also be hazardous to the local people and motorists as the heavy vehicles can create bottlenecks thus hindering smooth flow of vehicles. This is especially critical at the sharp bend (on B29) near the entrance of the project site.

Mitigating Measures

Appropriate warnings and traffic signs should be erected to alert road users of potential traffic conflicts. Loading and unloading must be avoided along the main road and if loading and unloading works become necessary then the activities should be segregated from the traffic stream by brightly painted movable barriers. Damage public roads must be promptly repaired to reduce the risk of accidents to the public travelling on poorly maintained road.

6.8.4 Road Safety

Potential Impacts

Road traffic is expected to increase significantly due to the increase in the local population and hence mobility. The generated traffic can put additional pressure on the existing road infrastructure. Although congestion is not expected, even during the morning and evening peak, road conflicts at the intersection to the housing project can pose safety risk, if the intersection is not signalized.

Mitigating Measures

It is recommended that the intersection of the road into and out of the housing project with state road B29 be signalized to minimize vehicle conflicts that can cause

accidents. The intersection should also be lighted at night to further enhance the safety of motorists.

6.8.5 Increased Economic Opportunities

Potential socioeconomic impacts of significance with regards once the houses are occupied are increase business and economic opportunities as local demand for goods and services rise. In tandem with the higher demand, jobs will be created thus increasing the level of income level of the local population. Subsequent economic impact in the form of secondary expenditure will further boost the local economy. The impacts are positive in nature and hence no mitigating measure is required.

6.8.6 Abandonment (Socio Economy)

In the case of socio-economy, abandonment would generate negative impacts on the economy of the workers and contractors involved in the project. Workers would have to be retrenched, hiring of machines, equipment and construction vehicles would have to be halted and many business deals would have to be aborted.

6.9 ECOLOGY

6.9.1 Impacts To The Flora

During pre-construction phase, some vegetation may be slashed to make small trails for surveying purpose. No significant impact is expected and mitigation is not required during this phase. During land clearing, 100% vegetation from about 100% the Project site will be removed. There would be permanent loss of plant diversity. However, no significant impacts are expected in terms of plant biodiversity as no rare, endemic or endangered plant species were found within the Project site.

6.9.2 Mitigation Measures (Flora)

Mitigation measures proposed to reduce impact to the flora are:

- Usable rubber wood will be sold as it has high market demand;
- Unusable stump and small branches will be left rot within project site; and
- Burning of vegetation biomass is prohibited.

6.9.3 Impacts To The Fauna

Human activities, vehicle movements and use of equipment/instrument during the survey may cause noise during day-time. Most animals would stay away from the noise sources. No significant impact is expected during pre-construction period.

6.9.4 Mitigation Measures (Fauna)

Mitigation measures proposed to reduce impact to the fauna are land clearing:

- Land clearing should be conducted in phases from east west direction within an appropriate time to chase the animals to the nearby plantation/shoo away.

7.0 RESIDUAL IMPACTS AND RECOMMENDATIONS

7.1 RESIDUAL IMPACTS

Environmental issues that may have some impact to the surrounding environment are water quality due to sewage generation and soil erosion, air quality due to dust during construction phase, and noise due to earthworks and construction activities and increased traffic but the impacts were predicted to be not adversely significant and appropriate mitigating measures have been proposed to be implemented.

An Environmental Management Plan (EMP) will need to be drawn to ensure that all the mitigating measures are effectively implemented during all stages of the project development to provide maximum protection of the surrounding environment.

An Abandonment Plan needs to be established to outline the procedures and appropriate measures to be taken to restore, rehabilitate or make safe those components of the project that will be abandoned or decommissioned.

Some main activities are adequate notification of intent to cease operations be given to the relevant; dismantling of structures, machinery and equipment as well as removing and disposing off; disposal of solid and hazardous / scheduled wastes; cleanup of area; rehabilitation and restoration; construction or installation of a security system and post-abandonment inspection and monitoring.

Table 1. Summary of Environmental Impacts and Mitigation Measures

Source of Environmental Risk	Potential Environmental Impacts	Environmental Consequences	Mitigation Measures	DOE's Comment
Construction Phase				
Construction Activities	Soil erosion	<ul style="list-style-type: none"> Affects slope stability; Interruption of surface drainage; Alteration of subsurface movements due to redistribution of soil and rock materials; and Change in distribution of mass on slope surface by cut and fill works. 	<ul style="list-style-type: none"> Land clearing and earthworks are carried out in phases with 3 months break between phases. Land clearing should be confined within Phase 1 development and the excess materials will be filled on part of Phase 2 and 3. Retain maximum cover of natural vegetation as well as original topography on undeveloped areas. 	
Site clearing/ tree cutting	Soil erosion	<ul style="list-style-type: none"> Riparian area disturbance. 	<ul style="list-style-type: none"> Hydroseeding and geotextile membrane shall be applied on cut slopes to establish vegetation at the shortest time possible. Planting of grass at flat and sloped areas not occupied by building and infrastructure units as soon as possible. 	
Earthworks	Soil erosion	<ul style="list-style-type: none"> Excavated soil or displaced materials is susceptible to erosion; and 	<ul style="list-style-type: none"> More stringent precautionary actions should be undertaken when developing Sub-phases 4, 6 and 5 respectively which have the highest erosion risks; 	

Source of Environmental Risk	Potential Environmental Impacts	Environmental Consequences	Mitigation Measures	DOE's Comment
Removal of surface vegetation	Flood	<ul style="list-style-type: none"> Earth moving activities cause increased erodibility due to changes in pore water pressure and slope stability. 	<ul style="list-style-type: none"> Construction of berm drains and turfing at gentle slopes. Slopes shall be designed to 1:2 (horizontal) and 1:1.45 (horizontal) gradients. Filling at designated stockpile area shall not obstruct natural water flow or create ponding in the neighbouring area; and Construction of platforms to follow the existing terrain as much as possible, so as to minimize the cut and fill volume. 	
Sediment transported to streams	Water pollution	Increase in run-off and impermeable areas.	<ul style="list-style-type: none"> Filling at low-lying areas shall not obstruct natural water flow or create ponding in the neighboring area. Formulation of a drainage plan to include both temporary and permanent drains; and Temporary sedimentation pond/silt trap is to be constructed during the project construction. 	
		Potential source of water-borne diseases.	<ul style="list-style-type: none"> Establishing silt traps/sediment basins; All sullage, toilet wastewater and contaminated washing are to be treated in the treatment system; Oily wastes to be stored in containers for disposal by DOE licensed contractors. 	

Source of Environmental Risk	Potential Environmental Impacts	Environmental Consequences	Mitigation Measures	DOE's Comment
Land clearing, excavation and construction work	Noise pollution	The impacts are temporary and transient and occur mainly during the daytime as construction activities are only allowed during the daytime.	<ul style="list-style-type: none"> Restrict timing of construction activities; Set the limit for noise emitted by vehicles, machinery and pumps; Noise monitoring during the construction phase to determine compliance with statutory criteria; and Consultation with parties that are affected by the noise. 	
Heavy machinery	Physical injuries	Workers shall be exposed to the potential danger of industrial accidents; and	<ul style="list-style-type: none"> Ensure that vehicles and machineries are well maintained, road worthy and not faulty; and Workers should be properly attired and follow safe working procedures. 	
Site clearing, Earthworks and Construction of Civil structures	Air pollution	Air pollution from airborne dust during construction activities.	<ul style="list-style-type: none"> Regular water spraying of the exposed ground; Re-turfing of exposed ground; and Executing the earthwork in stages. 	
Establishment of base camps	Overcrowded and cramped base camps	<ul style="list-style-type: none"> Contagious diseases; Poorly maintained toilets; and Insufficient disposal of garbage. 	<ul style="list-style-type: none"> Adequate space should be provided in the camp to avoid over-crowding; Base camp will need to be self-contained and provided with proper basic facilities; and Systematic and properly supervised garbage collection and disposal services. 	

Source of Environmental Risk	Potential Environmental Impacts	Environmental Consequences	Mitigation Measures	DOE's Comment
Movements of construction vehicles	Increase the likelihood of accidents	<ul style="list-style-type: none"> The vehicles can be hazardous to the local people and motorists; Heavy vehicles can create bottlenecks thus hindering smooth flow of vehicles; and Heavy trucks and lorries carrying heavy loads can cause damage to the local roads. 	<ul style="list-style-type: none"> Appropriate warnings and traffic signs should be erected to alert road users of potential traffic conflicts; recommended that two flagmen are stationed along state road B29 to provide advance warning; and Loading and unloading must be avoided along the main road. 	
Land clearing	Permanent loss of vegetation and plant density	No significant impacts are expected in terms of plant biodiversity as no rare, endemic or endangered plant species were found within the project site.	<ul style="list-style-type: none"> Usable rubber wood will be sold as it has high market demand; Unusable stump and small branches will be left to rot within project site; and Burning of vegetation biomass is prohibited. 	
Land clearing	Human activities, vehicle movements and use of equipment/instrument	<ul style="list-style-type: none"> Reduce of food supply of animals; and Demolish of habitat; 	<ul style="list-style-type: none"> Land clearing should be conducted in phases from east west direction within an appropriate time. 	
Operational Phase				
Diminishing natural impounding areas	Increased impermeable surface over designated build-up locations	Flood	A Detention pond (KT) was allocated within project site.	
Sewage from the housing and commercial areas	Water pollution	Untreated sewage when discharged into surface drainage systems might be a potential source of water-borne diseases.	Proposed STP is capable of treating sewage to meet Standard A requirements.	

Source of Environmental Risk	Potential Environmental Impacts	Environmental Consequences	Mitigation Measures	DOE's Comment
Increase of local population and hence mobility	Increase of road traffic	Road conflicts at the intersection to the housing project can pose safety risk.	<ul style="list-style-type: none"> It is recommended that the intersection of the road into and out of the housing project with state road B29 to be signalized to minimize vehicle conflicts; and The intersection should also be lighted at night to further enhance the safety of motorists. 	
Littering and indiscriminate dumping solid wastes	Deterioration of the environment with respect to general aesthetic and health impact	<ul style="list-style-type: none"> Create potential breeding ground for pests; Source of diseases; and Source of odour and discomfort to residents and visitors. 	<ul style="list-style-type: none"> Rubbish and solid waste must be regularly collected together with the other waste, transported out and disposed off at approved sanitary landfill (Bukit Tagar Sanitary Landfill); Ample number of suitably design rubbish bins must be placed at strategic locations; and Garbage must be regularly collected and disposed by licensed contractor. 	
Abandonment Project abandonment	The cleared landscape may induce further environmental disturbance	Workers would have to be retrenched, hiring of machines, equipment and construction vehicles would have to be halted and many business deals would have to be aborted.	<ul style="list-style-type: none"> Public safety must be safeguarded; Proper removal and disposal of all types of wastes from sites and dismantling structures that cannot be secured; and The removal of these wastes and structures will also improve the visual aesthetics of the area. 	