

Executive Summary

1.0 Introduction

The Project is known as “**PROPOSED 3.3 ACRES RECLAMATION AT PULAU MELAKA, KAWASAN BANDAR XLIII, DAERAH MELAKA TENGAH, MELAKA**”. The Project area of about 3.3 acres (1.3349 ha.) will be reclaimed at the south tip of Pulau Melaka (21°0'38.57"N ; 102°15'10.02"E) facing the seafront of Straits of Malacca.

The proposed Project development involves reclamation of land thus it falls under the purview of Item 7 of the *Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order, 2015* which is described as “Coastal reclamation or land reclamation along river banks involving an area of less than 50 hectares”. As such, an Environmental Impact Assessment (EIA) report is prepared and submitted to the Department of Environment (DOE) for approval.

The project is initiated by Seaview Landmark Sdn. Bhd. The Preliminary EIA report is prepared and submitted by Eco Dynamic Environmental Consultancy.

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2.0 Statement of Need

Tourism is now one of the important earners of foreign exchange for the country and its contribution is expected to grow. Melaka is a world renowned tourist destination due to its rich historical and cultural heritage. The State received about 13.7 million tourist population in year 2012. The average annual growth in tourist arrival to the State from year 2000 to 2012 is 17.45%. The number of tourist is expected to exceed 16 million in year 2016. This scenario illustrated an increase trend for facilities requirement with strong relation in growth of the tourism industry.

The State government has given special attention to the reclamation of land along the coast as one of the means to generate additional land for residential, commercial and tourism development. The proposed Project involves reclamation of 3.3 ac. of land along the coastline of Pulau Melaka, will be part of a 15 ac. mixed development comprising hotel, serviced apartment and water chalet. It is located at the gazette zone for land reclamation and will contribute to additional land banks to cater for tourist related product.

3.0 Project Description

The proposed Project site is located at Kawasan Bandar XLIII, Daerah Melaka Tengah, Melaka. The exact location of the proposed site is at the south tip of Pulau Melaka approximately 0.5 km off the coast of Bandar Hilir Melaka facing the Straits of Malacca. Pulau Melaka is a man-

made island which linked to the mainland by a 30 m bridge. The Project site is reachable via Jalan Pulau Melaka 8. The Project Key Plan and Location Plan are shown in **Figure ES-1** and **Figure ES-2**.

Some notable features in the vicinity of the Project site include estuary of Sungai Melaka located about 1.6 km to the northwest, Malacca Straits Mosque at approximately 325 m to the northwest, Apartment Pulau Melaka at about 450 m northwest and the proposed Melaka Gateway Project at about 360 m to the east of the Project site respectively.

The proposed reclamation land is conceptually planned to be developed as tourism-related project integrating hotel and serviced apartment development with a water chalet covering a total area of about 15.0 acres. The water chalet will be constructed on platform supported by piles founded direct on the sea bed offshore of the Project site. The Approved Layout Plan is shown in **Figure ES-3**.

Figure ES-1: Project Key Plan



Figure ES-2: Project Location Plan

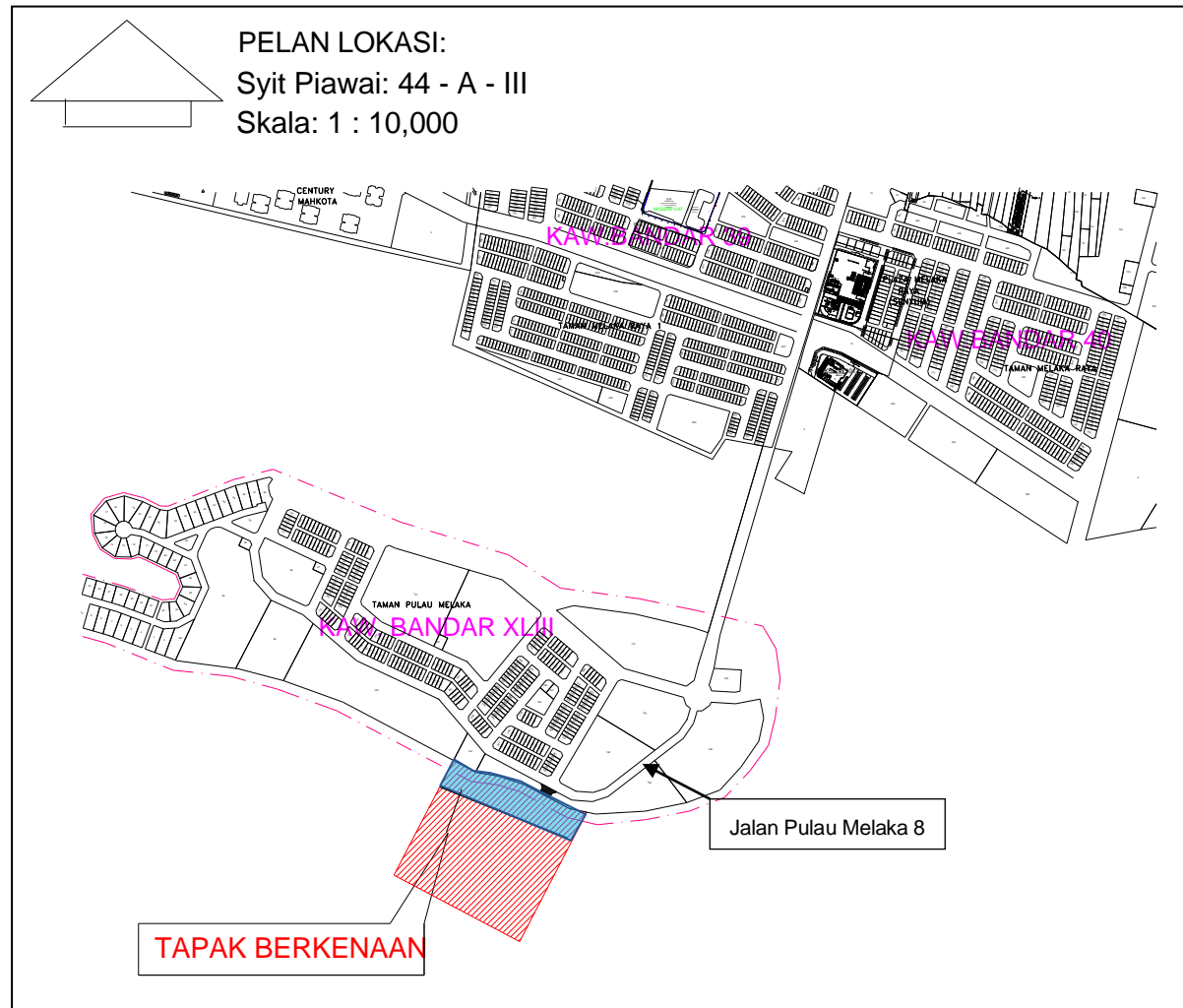
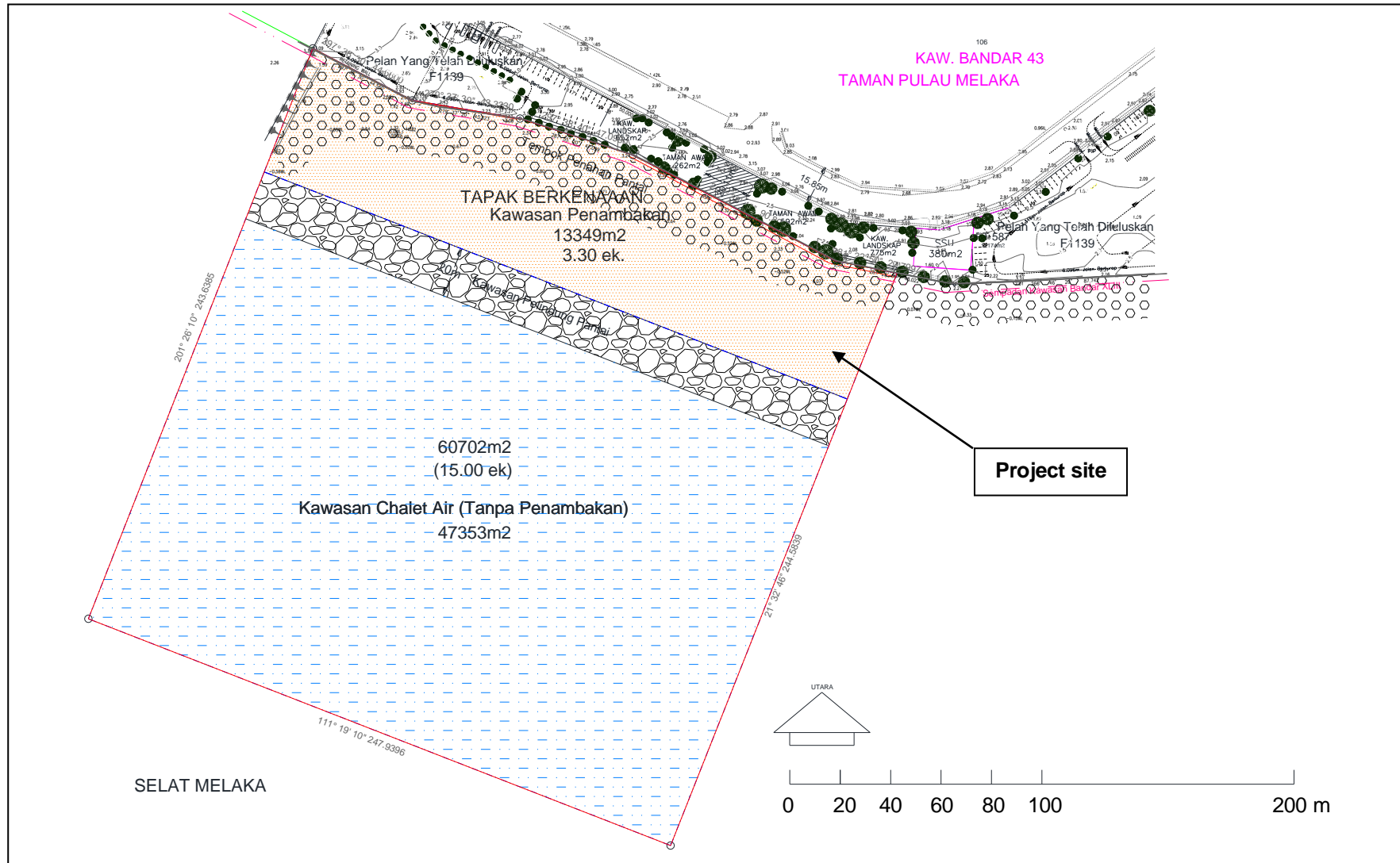


Figure ES-3: Approved Layout Plan



4.0 Existing Environment

Table ES-1: Existing Environment

Environmental Component	Description												
Geometry Coordinates	<table border="0"> <tr> <td>Northeast Corner</td> <td>N 2° 10'38.0"</td> <td>E 102° 15'13.9"</td> </tr> <tr> <td>Northwest Corner</td> <td>N 2° 10'40.9"</td> <td>E 102° 15'06.3"</td> </tr> <tr> <td>Southeast Corner</td> <td>N 2° 10'36.4"</td> <td>E 102° 15'13.2"</td> </tr> <tr> <td>Southwest Corner</td> <td>N 2° 10'39.3"</td> <td>E 102° 15'05.7"</td> </tr> </table>	Northeast Corner	N 2° 10'38.0"	E 102° 15'13.9"	Northwest Corner	N 2° 10'40.9"	E 102° 15'06.3"	Southeast Corner	N 2° 10'36.4"	E 102° 15'13.2"	Southwest Corner	N 2° 10'39.3"	E 102° 15'05.7"
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Bathymetry Survey	The Project site is situated at the depth of approximately 0 m CD to 6 m CD. The Project will be reclaimed at the shallower area less than 2 m CD. The water chalet will be located on the bathymetry of 2 m CD to 6 m CD.												
Tides	Tide is semi-diurnal. The nearest standard port referred is Tanjung Keling.												
Current	The overall current flow in the Strait of Malacca is dominant towards the northwest direction with speeds between 0.1 – 0.7 m/s during both northeast (NE) and southwest (SW) monsoons. Current flow measurement showed that approximately 73% of the measured current speeds are less than 0.5 m/s. Only about 2% of the measured speed above 0.8 m/s.												
Soil condition	The soil type at the proposed Project site is mainly clayey silt and sand.												
Climate	<p>Meteorological station : Batu Berendam Airport Station. Hindcast offshore wind data: Global Reanalysis of Ocean Waves Mean annual rainfall : 2,016.7 mm Mean temperature : 26.9°C Predominant wind directions: North-west. Common wind speed: 2.5 m/s - 5 m/s (52% of occurrence time) Maximum wind speed: 7.5 m/s – 12.5 m/s (3% of occurrence time)</p>												
Land Use	<p>The Project site is located at the southern shoreline of Pulau Melaka approximately 325 m to the east of Malacca Straits Mosque. Pulau Melaka is identified for commercial, residential and leisure-cum-tourism development. Presently, 'The Wildlife Theatre', 'Pangsapuri Pulau Melaka' and 'Melaka Straits Mosque' have been opened for visitors. The island is mainly established with commercial shop-office lots. The island was furnished with basic infrastructures and utilities including road, drainage system, STP, water tank etc.</p> <p>Along the shoreline of the mainland opposite Pulau Melaka, a few reclamation projects were on going.</p> <p>The estuary of Sg. Melaka is situated at about 1.6 km to the northwest of the Project site. The nearest sensitive receptor are Malacca Straits Mosque and Apartment Pulau Melaka at about 325 m and 450 m to the northwest of the Project site respectively.</p>												

Environmental Component	Description
	Several environmental sensitive areas (ESA) are found beyond 5 km radius of the Project site including Pulau Upeh, Pulau Nangka, Pulau Hanyut, Pulau Besar, Pulau Serimbun.
Water Quality	Marine water quality at sampling point MW1, MW2 and MW3 were categorized as <i>Class 2</i> under the <i>Malaysia Marine Water Quality Criteria and Standard (MMWQCS)</i> .
Air Quality	The PM ₁₀ level at project boundary, A1 was 40 µg/m ³ , which is well under the limit of the <i>Malaysian Ambient Air Quality Standard 2013</i> . The nitrogen dioxide (NO ₂), sulphur dioxide (SO ₂) and hydrogen sulphide (H ₂ S) were not detected
Noise Quality	The noise levels at N1 (56.8 dB(A) and 55.5 dB(A) for day time and night time respectively) was within the limit of 60 dBA during day time but slightly exceeded 50 dBA at the night time.
Biological Environment	No endemic species was identified and all the species identified have been recorded in various other benthic surveys around the country.
Socio-Economic	The proposed development area is located to the main tourism spot of the State in Pulau Melaka. The immediate surrounding social-economic activities are mainly commercial and tourism.

5.0 Assessment of Impacts and Mitigating Measures

The potential impacts and proposed mitigating measures are summarized in **Table ES-2**.

Table ES-2: Summary of Activities, Potential Impact and Mitigating Measures

Project Activities	Potential Impacts	Mitigation Measures	Residual Impacts	DOE Remarks
A. Construction				
1. Mobilization (equipment, dredging vessels, workboats, workforce)	<ul style="list-style-type: none"> • Fugitive dust generation. • Vehicle/ machinery exhaust gas emissions. • Vehicles/ machinery noise emission. 	<ul style="list-style-type: none"> • Watering operations and regular wetting down to control dust. • Proper maintenance of dump trucks and machinery to minimize exhaust gas pollutants. • Restrict noise-generating operation to daylight working hours (0700 – 2200 hours). 	None	
2. Sand mining and transportation	<ul style="list-style-type: none"> • Removal of benthos population. • Decline in marine water quality. • Impact on marine hydrodynamic due to anchoring. • Vessel release air contaminants. • Accidental spillage of fine material and oily waste discharge. • Vessel and machinery noise emission. • Transportation/ navigation safety. 	<ul style="list-style-type: none"> • Limited to minimum mining area. • Using proper dredging technology with good housekeeping. • Anchoring at only the pre-determined locations with approved anchor pattern. • Minor and insignificant. Control measures not required. • Good housekeeping to avoid spillage and overflow from transport vessel must be filter prior to discharge. • Regular maintenance of vessel and machinery to avoid oil spill. • Vessels shall be equipped with slop tanks for oily waste discharges. • Minor and insignificant. Control measures not required. • Relevant authorities eg. Marine Department, Fisheries Department and tour operators must be advised 	None	

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Project Activities	Potential Impacts	Mitigation Measures	Residual Impacts	DOE Remarks
	<ul style="list-style-type: none"> • Employment opportunities 	<ul style="list-style-type: none"> on activities. • Proper navigational aids should be installed to minimise the possibility of collision. • Locals must be priority for job opportunities. 		
<p>3. Sand filling/ reclamation</p>	<ul style="list-style-type: none"> • Impact on hydrodynamic and wave. • Impact on sediment transport and morphology. • Impact on sediment spill and increase in TSS level. • Impact on hydrology and drainage. • Fugitive dust and exhaust gas emission from vehicles and machineries. • Noise from equipment and machinery in reclamation activities. • Change of marine biological environment. • Marine navigation – may 	<ul style="list-style-type: none"> • Impact is insignificant. No control measures required. • Impact is minor, no control measures required. • Double-layered silt curtains must be properly in place before sand filling begins. • Best available procedure for sand filling shall be used to avoid spillage outside of demarcated project area. • Regular monitoring must be carried out to ensure sudden surge in TSS level can be mitigated early. • Existing drainage system shall not be damaged or clogged to avoid localized flooding. • Regular maintenance of vehicles and machinery. • Regular wetting and washing down of exposed soil and tyre. • Restrict noise-generating operation to daylight working hours (0700 – 2200 hours). • Restrict corridor of working and schedule works in phases. • Relevant authorities eg. Marine 	<ul style="list-style-type: none"> • Hydraulic study showed the change of current and wave will be minimal but permanent. • Possible decline in water quality once the reclamation land is developed. Proper control shall implemented. 	

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Project Activities	Potential Impacts	Mitigation Measures	Residual Impacts	DOE Remarks
	<p>interfere with marine traffic.</p> <ul style="list-style-type: none"> • May interfere with local fishing activities. • Public Health and safety. <ul style="list-style-type: none"> • Damage of Public Property. • Job Opportunities. 	<p>Department, Fisheries Department and tour operators must be advised on activities.</p> <ul style="list-style-type: none"> • Proper navigational aids should be installed to minimise the possibility of collision. • Affected fishermen must be appropriately compensated. • Contractor shall comply the provision of Occupational Safety and Health Act and Regulation. • Project area shall be isolated with hoarding. • Traffic movement shall be taken care and access roadway shall be maintained. • Damage of road and public property shall be repaired. • Strict supervision and proper work procedures to prevent public property damage. • Locals must be priority for job opportunities. 	<ul style="list-style-type: none"> • Decline in fisheries activities. 	
<p>4. Construction of Revetment</p>	<ul style="list-style-type: none"> • Decline in marine water quality mainly increase in TSS. • May interfere with local fishing activities. 	<ul style="list-style-type: none"> • Proper operating procedures should be maintained to reduce excessive re-suspension of bottom materials when placing rock materials. • Double-layered silt curtains must be properly in place. • Affected fishermen must be appropriately compensated. 	<p>None</p>	

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Project Activities	Potential Impacts	Mitigation Measures	Residual Impacts	DOE Remarks
	<ul style="list-style-type: none"> • Annihilation of benthic population from placement of rock bunds. This is inevitable but on the overall ecosystem the impact is not considered serious. • Job Opportunities. 	<ul style="list-style-type: none"> • Make sure revetment is position as proposed to avoid the least damage possible. • Locals must be priority for job opportunities. 		
B. Abandonment and Demobilization				
1. Abandonment and demobilization	<ul style="list-style-type: none"> • Increase in TSS – Normally fine sediment will tend to accumulate on the silt curtains. This fine sediment will be re-suspended upon removal of curtains. • Increase in marine traffic. 	<ul style="list-style-type: none"> • Removal of curtains must be done by professionals. Fine sediment must be removed before removal of Silt curtain • Proper abandonment procedures must be followed. Any unused materials must be removed from the project site. • Relevant authorities eg. Marine Department, Fisheries Department and tour operators must be advised on activities. • Proper navigational aids should be installed to minimise the possibility of collision. 	None.	

6.0 Environment Management Plan (EMP)

Environmental Management Plan (EMP) shall be prepared to provide guidance to minimize potential environmental impacts during the reclamation stages of the proposed project. The EMP shall outline the key potential impacts, develop an environmental monitoring and audit program (EMAP), formulate a reporting format and to implement effective mitigating measures.

7.0 Residual Impacts, Recommendations and Conclusion

Residual Impacts and Recommendation

The environmental impacts due to the Project are generally well within acceptable levels. The analysis also showed that environmental impacts are of a short-term nature. While after the reclamation, the Project site will be left for settlement prior to further development. The impacts at the post-reclamation stage are limited and of minor concern.

Residual impacts that may still persist, although mitigation measures are fully complied during and after reclamation activities are current regime at Project area, fishing activities, marine water quality and positive impact on socio-economy.

The conversion of marine habitat to a terrestrial environment would change the current regime around the Project area and wave actions on the coast of Bandar Hilir. Although these changes may be permanent, in terms of magnitude they are small and not significant. Shoreline monitoring is recommended during Project implementation stage as well as post-reclamation stage to assess the impacts of the proposed reclamation works to adjacent shoreline as per JPS requirement.

Fishing activities adjacent to the Project vicinity and around Pulau Melaka are likely to decline in view of the extensive land reclamation projects within the region. The fishermen whose livelihoods are affected by the reclamation activities shall be duly compensated.

Upon completion of the reclamation Project, the water quality around the reclaimed area is not expected to change very much. However, upon development of the proposed reclaimed area proper mitigation measures must be put in place to avoid any decline on the quality of the surrounding waters.

The proposed Project will provide additional land-bank for the State of Melaka where tourism-cum commercial development can be expanded.

Conclusion

The proposed small reclamation Project of 3.3 acres is predicted not to generate significant adverse impact onto the local environment. The project site is also strategically located within an urban environment with good infrastructure and utility support. Given the favorable economic and social benefits that would accrue to the community, it is recommended that the Project should proceed.