

# Executive Summary

The Proposed Basement Sequential Batch Reactor (SBR) Sewage Treatment Plant 2 (28,000 PE) for Proposed Mixed Development (Plot 3) which Consists of Phase 2A, Phase 2B & Phase 2C on Lot PTB 24670, R&F Tanjung Puteri, Mukim Bandar Johor Bahru, Johor Darul Takzim by R&F Development Sdn Bhd

## Introduction

- Project Proponent proposed to develop a sewage treatment plant (STP) 2 at the basement of commercial serviced apartment at Phase 2B to cater sewage generated from mixed development of Plot 3
- The total area of the site is 0.842 acres of land
- The implementation scheduled of the proposed project includes operation and maintenance phase

## Legislative Requirement

Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order 2015, First Scheduled,

- Prescribed Activity 14 (c) : Sewage
  - (i) Construction of sewage treatment plant with 20,000 population equivalent or more

## Project Location

The proposed project site is located on Lot PTB 24670, R&F Tanjung Puteri, Mukim Bandar Johor Bahru, Johor Darul Takzim with centre coordinates of Latitude N 1°27'28.88" and Longitude E 103°46'12.89".

## Statement of Need

- i. To operate sewage treatment plant (STP) 2 to cater sewage generated from the mixed development of Plot 3
- ii. To ensure the sewage generated from the mixed development of Plot 3 is well treated before being discharged to the watercourse, hence minimize the pollution loading to the marine water, Straits of Johor
- iii. To have proper sewage management which to comply with Standard A of Environmental Quality (Sewage) Regulations 2009
- iv. To maintain clean water for the propagation and survival of fish and other aquatic life in Straits of Johor and avoid serious public health problem due to improper disposal or use of sludge and sewage

### Project Proponent



R&F Development Sdn Bhd

Lot-086-A5, Mercu 1, Jalan Tanjung Puteri 1,  
R&F Tanjung Puteri, 80300 Johor Bahru,  
Johor Darul Takzim

### EIA Consultant

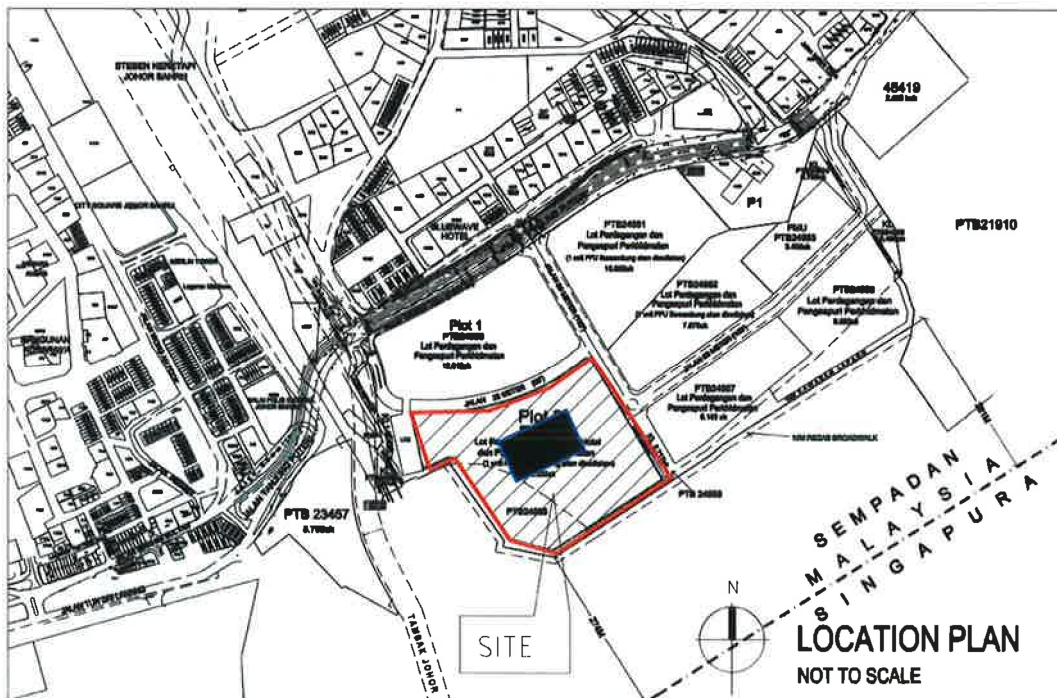
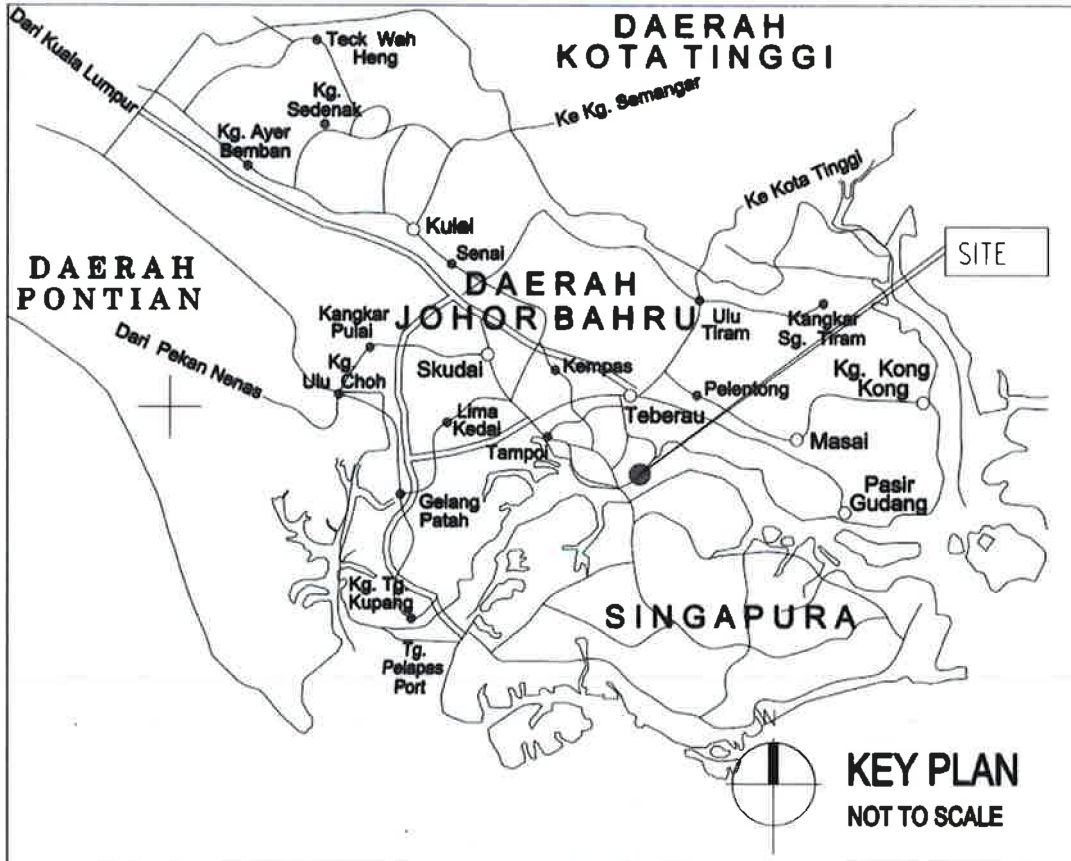


Ecochem Engineering Sdn Bhd

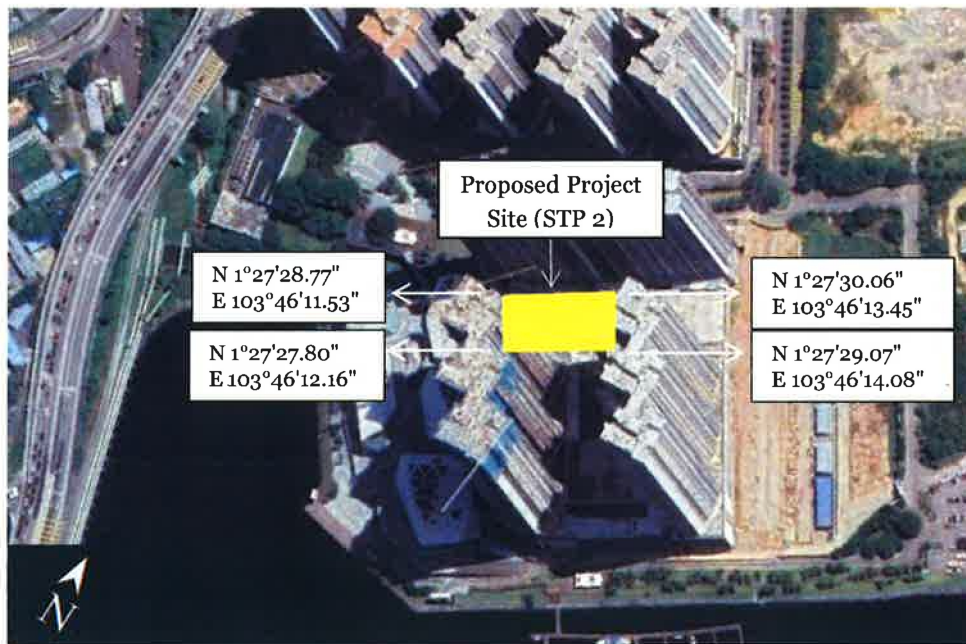
6B, Jalan Mutiara 1/14, Taman  
Mutiara Mas, 81300 Skudai, Johor



# Key Plan & Location Plan



## Project Boundary and Coordinates

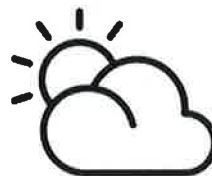


## Existing Environment



### Topography

Slope: <math>< 15^\circ</math> for all part of proposed project  
 Elevation: does not exceed 5m above sea mean level



### Climate

Senai Meteorological Station  
 Humidity: 84%  
 Temperature: 27.2°C  
 Rainfall: 7.7mm.  
 Wind speed: 1.4 m/s



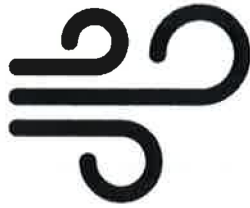
### Marine Water Quality

MMWQI at monitoring station W1 (HT), W2 (HT, LT), W3 (HT, LT), W4 (HT) classified as poor, while W1 (LT) and W4 (LT) classified as moderate



### Noise Level

The result of noise level for all monitoring stations are below 65 dBA (daytime) and 60 dBA (nighttime)



**Air Quality**

All monitoring stations comply to Malaysia Ambient Air Quality Standard, 2020.



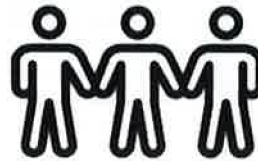
**Flood and Erosion**

The risk of flood and erosion is minimal.



**Traffic**

Jalan Tanjung Puteri or Jalan Ibrahim Sultan  
Peak hours:  
7.00 a.m – 8.00 a.m  
5.00 p.m – 7.00 p.m

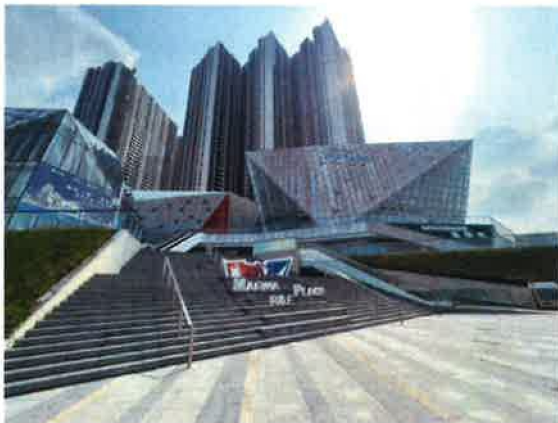


**Socio-economic**

Nearest commercial serviced apartment is located within the STP 2 building



**Existing Landuse**



Existing environment at proposed project site



Hutan Bandar MBBJ  
(3.57 km)



CIQ Johor  
(0.90 km)



Muzium Diraja Sultan Abu Bakar  
(1.51 km)



Columbia Asia Hospital - Tebrau  
(4.65 km)



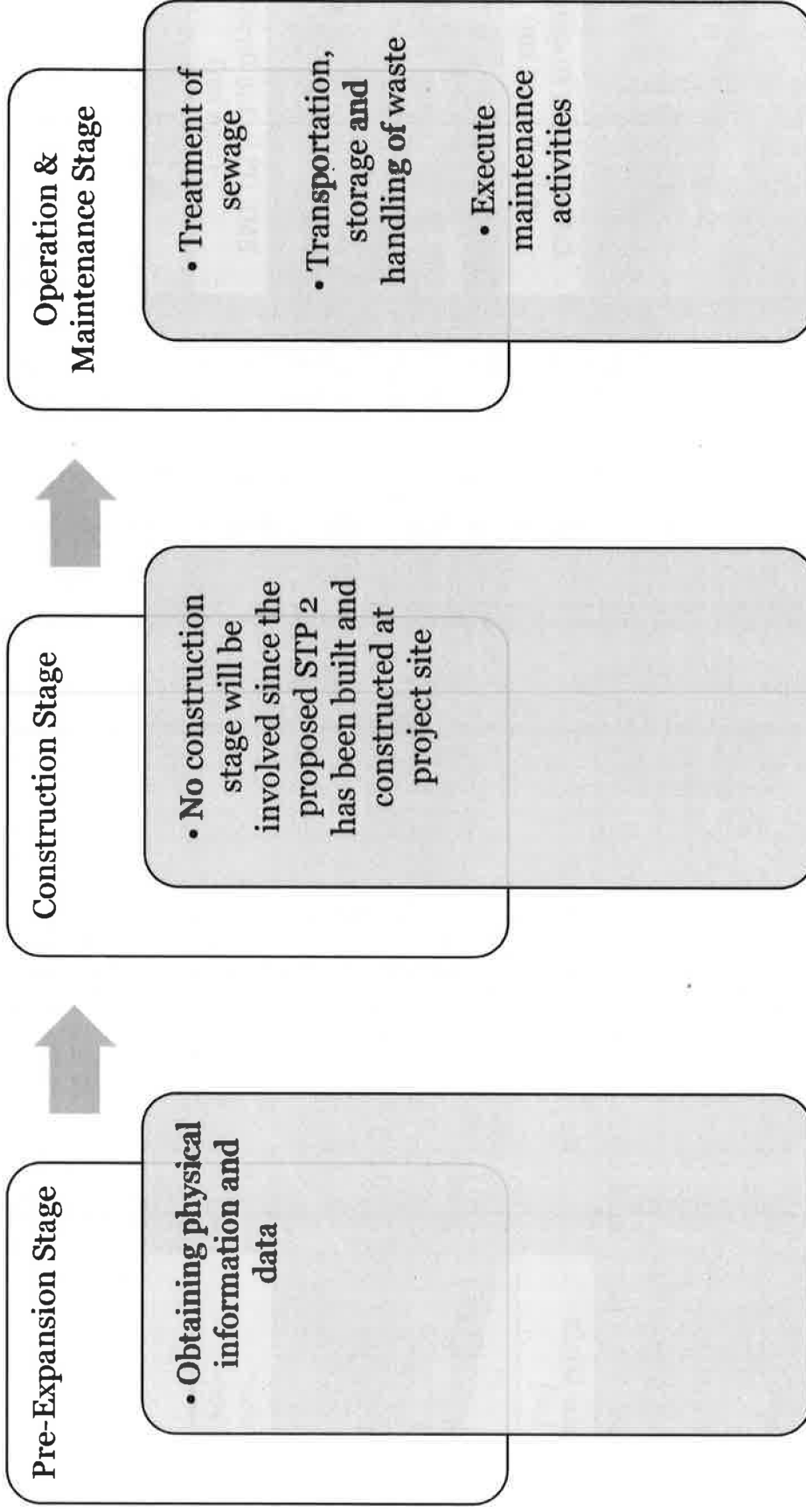
SMK (P) Sultan Ibrahim  
(2.56 km)



Putri Indah Condominium  
(0.79 km)

Land use map within 5 km radius surrounding the Proposed Project site

## Project Activities





## Project Description

- The Project Proponent proposed to develop a sewage treatment plant (STP) 2 with capacity of 28,000 PE to cater the sewage generated from the mixed development of Plot 3
- The proposed STP 2 will be using sequential batch reactor system
- Currently STP 2 is already built and installed at project site
- This proposed project consists of 1 phase only which is operation & maintenance stage
- The testing and commissioning for STP 2 is estimated within 2 months after obtaining EMP approval
- The overall breakdown of population equivalent (PE) for the proposed STP 2 is shown below:

Table 1: Breakdown of Population Equivalent (PE) for Phase 2A - Opera Harbour Street

Level	Usage	Built Up (m <sup>2</sup> )	PE	Total PE
Lower level 1	Restaurant, yacht club	2876.49	2876.49 m <sup>2</sup> x 3 per 100m <sup>2</sup>	86.29
Level 1	Sales gallery, restaurant + food court	5263.59	5263.59 m <sup>2</sup> x 3 per 100m <sup>2</sup>	157.91
Level 2	Sales gallery, retail, opera theatre, restaurant	4150.84	4150.84 m <sup>2</sup> x 3 per 100m <sup>2</sup>	124.53
Level 3	Retail, sky bar, restaurant, opera theatre	4097.01	4097.01 m <sup>2</sup> x 3 per 100m <sup>2</sup>	122.91
Level 4	KTV, sky bar, cinema	2348.45	2348.45 m <sup>2</sup> x 3 per 100m <sup>2</sup>	70.45
Level 5	KTV	675.86	675.86 m <sup>2</sup> x 3 per 100m <sup>2</sup>	20.28
Level 6 (roof top)	Service	-	-	-
<b>Total PE for Phase 2A</b>				<b>582.37</b>

Table 2: Breakdown of Population Equivalent (PE) for Phase 2B and Phase 2C

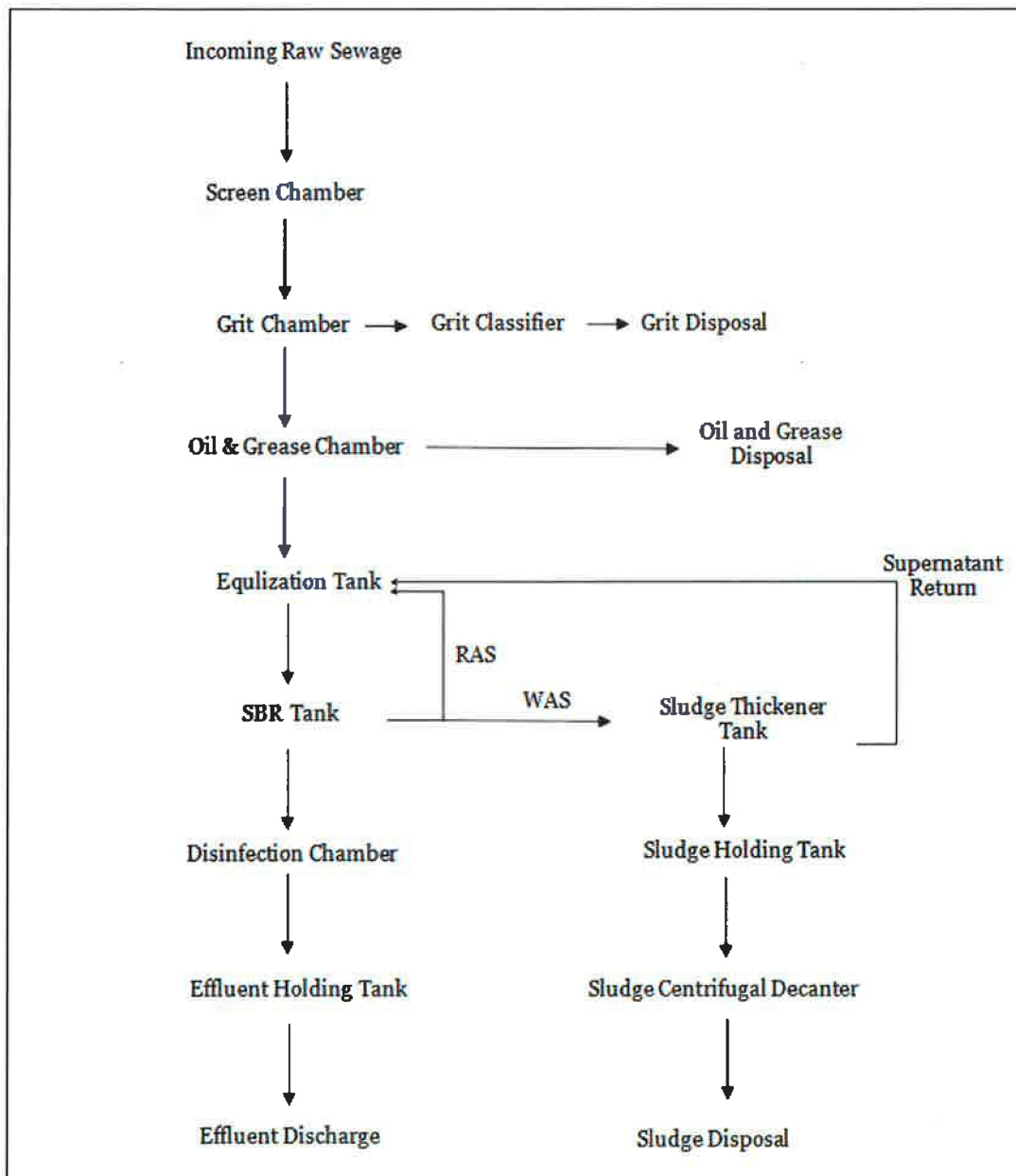
Level	Usage	No. Of	Built Up (m <sup>2</sup> )	PE	Total PE
<b>PHASE 2B - COMMERCIAL &amp; SERVICED APARTMENT</b>					
<b>i. PODIUM</b>					
Level 1-7	Carpark & Service	-	-	-	-

Level 1-6	Retail	62	7051.48	7051.48 m <sup>2</sup> x 3 per 100 m <sup>2</sup>	211.54
Level 3-7	Serviced apartment	140	-	140 unit x 5	700.00
Level 8	Facility	-	1638.24	-	-
Level 8	Kindergarten	-	4060.65	-	-
<b>ii. TOWER B1</b>					
Level 9-50	Serviced Apartment	1128	-	1128 units x 5	5,640.00
Roof Top	Service	-	-	-	-
<b>iii. TOWER B2</b>					
Level 8-49	Serviced Apartment	1116	-	1116 units x 5	5,580.00
Roof Top	Service	-	-	-	-
<b>iv. TOWER B3 AND B3A</b>					
Level 8-49	Serviced Apartment	1340	-	1340 units x 5	6,700.00
Roof Top	Service	-	-	-	-
<b>Total PE for Phase 2B</b>					<b>18,831.54</b>
<b>PHASE 2C - COMMERCIAL, SERVICED APARTMENT AND HOTEL</b>					
<b>i. PODIUM</b>					
Basement 1-3	Carpark and service	-	-	-	-
Level 1-5	Retail, facilities and ballroom	-	4000	4000 x 3 per 100m <sup>2</sup>	120.00
			17413	17413 x 3 per 100m <sup>2</sup>	522.39
<b>ii. OFFICE</b>					
Level 6-49	Office	-	57200	57200 x 3 per 100m <sup>2</sup>	1,716.00
<b>iii. SERVICED APARTMENT</b>					
Level 50-60	Serviced apartment	320	-	320 units x 5 PE/unit	1,600.00
<b>iv. HOTEL</b>					
Level 61-76	Hotel	323	-	323 units x 4 PE/unit	1,292.00
<b>Total PE for Phase 2C</b>					<b>5,250.39</b>



# Process Flow Diagram

## Sequential Batch Reactor (SBR) System





## Pollution Prevention and Mitigation Measures

### Potential Impact

#### Operation & Maintenance Stage

- Gaseous emission from SBR process
- Gaseous emission from truck for sludge disposal collection

Air Quality



#### Operation & Maintenance Stage

- Provide proper ventilation system to provide sufficient fresh air and reduce poisonous gaseous in the confined space
- Regular maintenance of truck to ensure no dark smoke or air pollutants released from vehicles during the sludge disposal collection

### Mitigation Measures

Noise

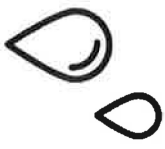
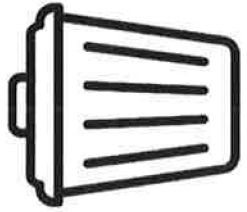



#### Operation & Maintenance Stage

- Noise generated from plant equipment such as pump and blower

#### Operation & Maintenance Stage

- Acoustic enclosure shall be provided especially at the equipment that produce high noise levels such as pump and blower
- Suitable noise absorbent materials shall be installed on machinery that produces high noise

	Operation & Maintenance Stage	Operation & Maintenance Stage
<b>Water Quality</b> 	<ul style="list-style-type: none"><li>• Discharge of untreated sewage from STP due to malfunctioning of equipment</li><li>• Spillage and leakage of fuels, lubricants and chemical during maintenance activity</li></ul>	<ul style="list-style-type: none"><li>• Routine maintenance shall be carried out to ensure the efficiency of the STP in treating sewage</li><li>• Fuel, lubricant and chemical shall be stored properly in containment tray</li></ul>
<b>Waste Management</b> 	<ul style="list-style-type: none"><li>• Generation of solid waste and scheduled waste during operation stage</li></ul>	<ul style="list-style-type: none"><li>• Recyclables materials shall be sent to relevant dealers for recycling purpose</li><li>• Scheduled waste shall not be stored more than 180 days from generation date or more than 20MT, whichever comes first</li></ul>
<b>Odour</b> 	<ul style="list-style-type: none"><li>• Odour emission from sludge storage area and dewatering process</li><li>• Odour nuisance during transportation and disposal of sludge</li></ul>	<ul style="list-style-type: none"><li>• Odour scrubber shall be provided to control odour emission</li><li>• Isolate odorous gases from general ventilation by containing identified odour generating sources with a separate local exhaust system</li></ul>

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**Operation & Maintenance Stage**

- Exposure to hazardous gas during malfunction STP or ventilation system
- Injury to people when handling chemical or hazardous substances during maintenance activity

**Operation & Maintenance Stage**

- Safety equipment such as rescue set of breathing apparatus and gas detector shall be installed at project site to detect any harmful gases or lack of oxygen conditions
- Emergency response plan (ERP) shall be aware by all personnel which includes the handling, storage, and process of chemical or hazardous substances as well as the planning on actions to be taken during emergency time

**Quantitative Risk Assessment**

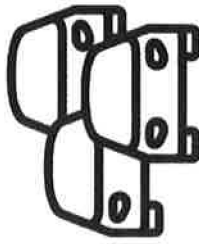
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**Operation Stage**

- Increase number of vehicular movements will increase the traffic flow and proportionately this may increase risk of road accident

**Operation Stage**

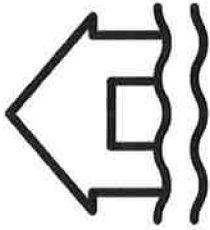
- Traffic rules must be strictly followed by road users and speed limit below 90 km/hr on highways and 60 km/hr on normal road is recommended

**Traffic & Transportation**

**Socio-economy**

Create job opportunities and expected to have employment of labour at the commercial area

Ensure legal registration of workers with Department of Immigration

**Flood**

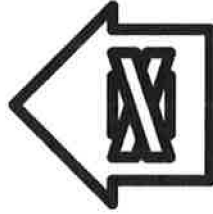
No significant impact since there is no changes in high-water levels around the overall project site after the development

No mitigation measures are required

**Biological Environment**

Proposed project is located at developed area. Thus, there is no endanger to the surrounding in biological aspect

No mitigation measure is required

**Abandonment & Closure**

Operation & Maintenance Stage	Operation Stage
<ul style="list-style-type: none"><li>• Involve dismantling of plant components and demolition of all facilities and infrastructure</li></ul>	<ul style="list-style-type: none"><li>• Preparation of detailed abandonment plan to be submitted to DOE</li><li>• Appropriate project remediation after removing and clearing of facilities and infrastructure shall be implemented by providing proper cover crops on the cleared area to prevent soil erosion</li></ul>



# Monitoring Programme

## **Performance Monitoring (PM)**

- Monitoring to ensure that the pollution control systems and other mitigation measures are perform in a good condition to reduce the adverse impacts from the proposed Project at a minimum level.
- Performance Monitoring (PM) during operation and maintenance stage are;
  - ✓ Sewage Treatment Plant
  - ✓ Odour Scrubber

## **Compliance Monitoring (CM)**

- Monitoring activities to be carried out to ensure that the EIA condition of approval (COAs) or any regulations under Environmental Quality Act 1974 are complied.
- An environmental audit may also be carried out to assess the overall project compliance.
- Compliance Monitoring (CM) during operation & maintenance stage are;
  - ✓ Final Discharge of Treated Sewage
  - ✓ Odour Scrubber

## **Impact Monitoring (IM)**

- Monitoring to verify that the findings of EIA study of potential impacts identified during EIA preparation stages are correct and effective in mitigating the adverse impacts to environment
- Impact monitoring (IM) during operation & maintenance stage are;
  - ✓ Water Quality
  - ✓ Marine Sediment Quality
  - ✓ Ambient Air
  - ✓ Noise



## Operation & Maintenance Stage

Point	Coordinates	Description	Parameters	Compliance Standards	Type of monitoring	Monitoring Frequency
<b>Water Quality</b>						
W1	N 1°27'29.64" E103°46'26.23"	Straits of Johor (East of project site)	Turbidity, BOD, COD, Total Suspended Solids, Oil and Grease, Colour, Faecal Coliform, Nitrate (NO <sub>3</sub> ), Phosphate (PO <sub>4</sub> ), Ammonia, Polynuclear Aromatic Hydrocarbons (PAH), Tributyltin (TBT), Cadmium, Copper, Lead	Malaysian Marine Water Quality Standard (MMWQS)	Impact monitoring (IM)	Monthly
W2	N 1°27'27.61" E103°46'22.22"	Discharge from existing drain to Straits of Johor				
<b>Marine Sediment Quality</b>						
SQ1	N 1°27'19.99" E 103°46'25.24"	Straits of Johor	Cadmium, copper, lead, zinc, arsenic, chromium, nickel	Marine Sediment Quality Standards - Chemical Criteria published by USEPA, 2015	Impact monitoring (IM)	Monthly/ quarterly
<b>Ambient Air Quality</b>						
A1	N1°27'30.89" E 103°46'8.84"	R&F Mall (Northwest from Project Site)	PM <sub>10</sub> , PM <sub>2.5</sub> , SO <sub>2</sub> , NO <sub>2</sub> , O <sub>3</sub> , CO, H <sub>2</sub> S	Malaysia Ambient Air Quality Standard, 2020	Impact monitoring (IM)	Quarterly
A2	N1°27'33.82" E103°46'20.15"	R&F Princess Cove (Northeast from Project Site)				



A3	N1°27'25.25" E103°46'12.16"	Permaisuri Zarith Sofiah Opera House (South from Project Site)				
<b>Noise Quality</b>						
N1	N 1°27'30.89" E 103°46'8.84"	R&F Mall (Northwest from Project Site)	Leg, Lmax, Lmin	Guidelines for Environmental Noise Limits and Control, 2019	Impact monitoring (IM)	Quarterly
N2	N 1°27'33.82" E103°46'20.15"	R&F Princess Cove (Northeast from Project Site)				
N3	N1°27'25.25" E 103°46'12.16"	Permaisuri Zarith Sofiah Opera House (South from Project Site)				
<b>Final Discharge of Treated Sewage</b>						
Sewage treatment plant	At project site	Temperature, pH, BOD <sub>5</sub> , COD, Suspended Solids, Oil and Grease, Ammoniacal Nitrogen, Nitrate Nitrogen, Phosphorus, Faecal Coliform	Environmental Quality (Sewage) Regulations 2009, Standard A	Compliance monitoring (CM)	Monthly	
<b>Air Pollution Control System</b>						
Odour Scrubber	At project site	H <sub>2</sub> S and NH <sub>3</sub>	Fifth Schedule (Regulation 15), Environmental Quality (Clean Air) Regulations 2014	Compliance monitoring (CM)	Quarterly	



**Sewage Treatment Plant**

Sewage treatment plant	At project site	Flowrate, pH, Temperature, BOD <sub>5</sub> , COD, Suspended Solids, Dissolved oxygen, Oil and Grease, Water colour, Turbidity, MLVSS, MLSS, SVI, Oxygen Uptake Rate, Settability Test  (The parameters shall be monitored accordingly to each STP unit treatment operations)	Guidance Document on Performance Monitoring of Sewage Treatment Systems, 2017	Performance monitoring (PM)	Daily Weekly Monthly
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**Air Pollution Control System Monitoring**

Odour Scrubber	At project site	Gas Flow, Pressure, Temperature, pH of liquor and opacity/stack condition	Technical Guidance on Performance Monitoring of Air Pollution Control Systems (APCS), 2015	Performance monitoring (PM)	Daily
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