

Executive Summary

Environmental Impact Assessment (EIA) for the Proposed for the Design, Construction, Completion, Testing, Commissioning And Handing Over Of The Module 3 (40,000 PE) Of Sewerage Treatment Plan (SEN 490) Including All Ancillary Works At Techpark 1, Bandar Enstek, Nilai, Negeri Sembilan

PROJECT PROPONENT:

EIA CONSULTANT:



THP Enstek Development Sdn. Bhd.



ES Eco Smart Sdn. Bhd.

INTRODUCTION

- This EIA report is prepared for the part of sewage treatment plant (STP) SEN 490 - Module 3 with capacity of 40,000 PE located at Techpark 1, Bandar Enstek, Nilai, Negeri Sembilan.
- This Module 3 is continuation of Modules 1 and 2 which located in the same compound. The SEN 490 plant currently has 72,600 PE, leaving just 9.25% of its 80,000 PE capacity available.
- Against this background, THPED is planning to build module 3 of the treatment plant within SEN 490, which will have an additional capacity of 40,000 PE to support further development and population growth in Bandar Enstek.

LEGISLATIVE REQUIREMENT

Section 34A, Environmental Quality Act (EQA) 1974, Environmental Quality (Prescribed Activities)(Environmental Impact Assessment) Order 2015;



First Schedule

Activity 14 (c)(i) Construction of sewage treatment plant with 20,000 population equivalent or more.

STATEMENT OF NEED



According to the technical review by Indah Water Consortium dated 3 September 2023, via letter reference number IWO/C/NS.6/98/067 (Appendix 3.1), the current connected Population Equivalent (PE) for the SEN 490 plant has reached 72,600 PE, leaving only 9.25% of the designed capacity of 80,000 PE available.



Supports Hala Tuju Strategik KD2: Pengurusan Mampan Sumber Asli, Sumber Makanan, dan Sumber Warisan, with a focus on KD2.3: Menjamin Kelestarian Sumber Air Berterusan and its associated action, KD2.3G: Mempertingkatkan Sistem Rawatan Air Kumbahan in NPP4



Conservation of river and sea water quality by implementation of sewerage treatment plants is a key factor in enhancing the natural environmental quality within the Malaysia Vision Valley (MVV) area.

PROJECT DESCRIPTION

DETAILS OF STP

1	Type of Proposed Plant	: Decanted Extended Aeration (IDEA) system
2	Design PE	: STP Module 3: 40,000 PE
3	Asset Number	: SEN 490
4	Location	: Part of Lot 29833, Persiaran Teknologi 1, Mukim Labu, Seremban, Negeri Sembilan Darul Khusus

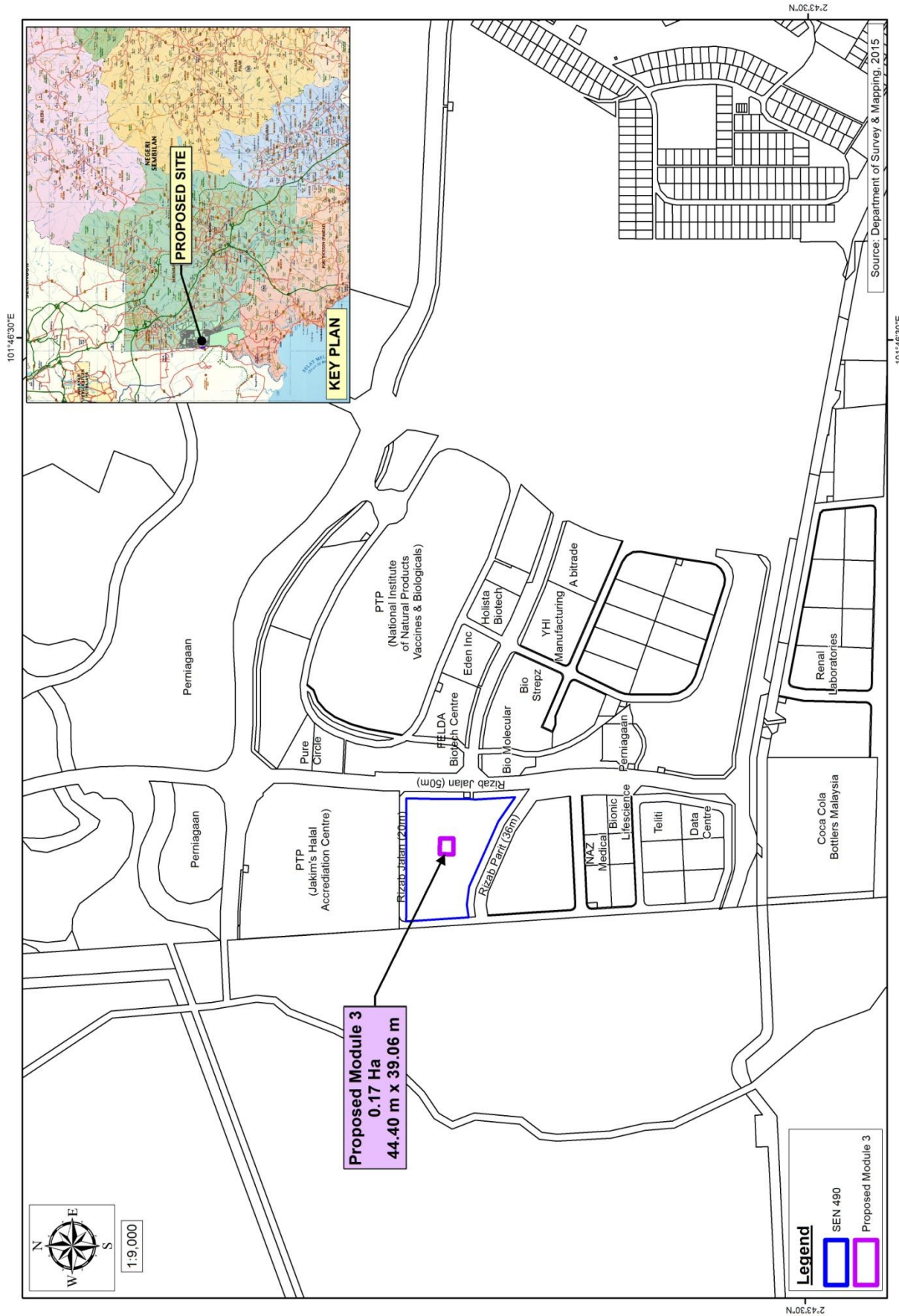
EXISTING COMPONENTS OF STP

Description	No of Tank
Raw sewage pumping station (existing)	1 (320,000 PE)
Secondary screen chamber (existing)	1 (320,000 PE)
Aerated Grit/Grease Chamber (existing)	2 (320,000 PE)
Flow Distribution Chamber (existing)	1 (160,000 PE)
Air blower room (existing)	1 (320,000 PE)
Disinfection Chamber (existing)	1 (160,000 PE)
Chlorination Room (existing)	1 (160,000 PE)
Sludge Dewatering Building (existing)	2 (160,000 PE)
Standby Sludge Sand Drying Beds (existing)	12 (320,000 PE)
Sludge Storage Hut (existing)	1 (160,000 PE)
Standby Generator Metal Shed (existing)	1 (80,000 PE)
Administration Building (existing)	1
Guard House (existing)	1

NEW COMPONENT FOR MODULE 3

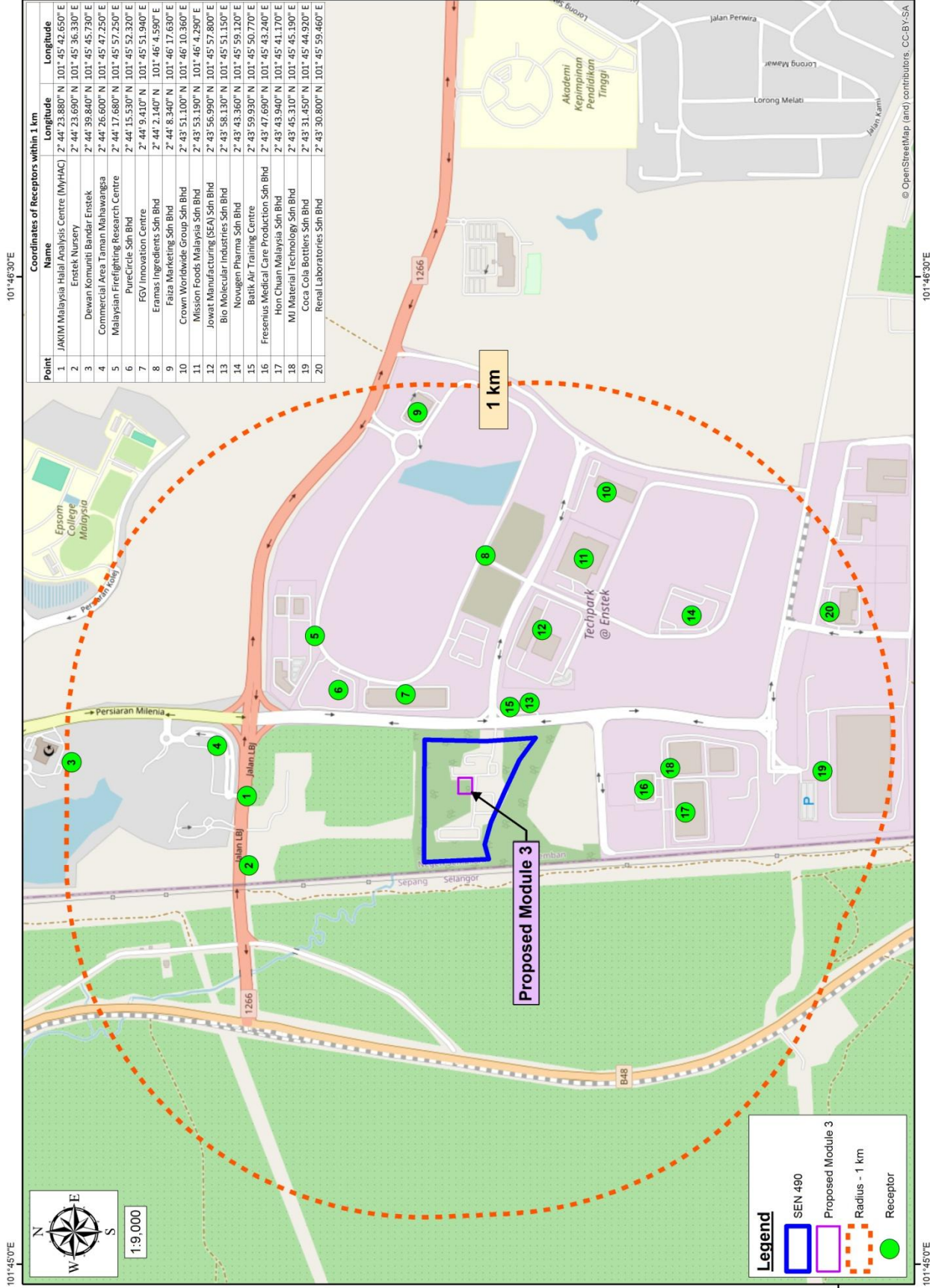
Description	No of Tank
Anoxic Tanks	1 (40,000 PE)
Demand Aeration Tanks	1 (40,000 PE)
Intermittent Aeration Tanks	1 (40,000 PE)
Sludge Holding tanks	1 (40,000 PE)
Primary screen chamber (existing)	1 (320,000 PE)

PROJECT LOCATION



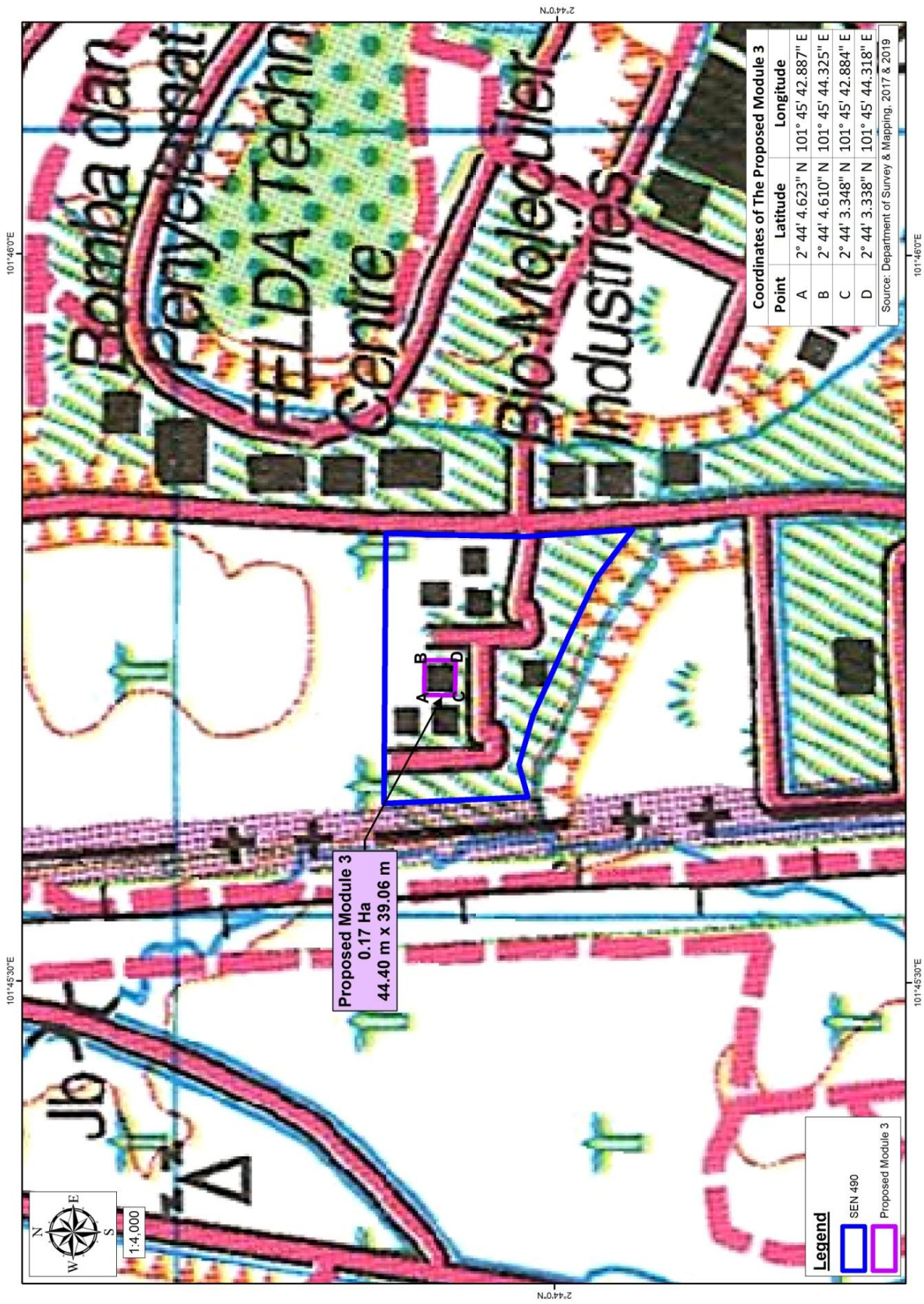
The total area earmarked for the STP SEN 490 is 7.66 hectares (18.939 acres) while the area for Module 3 is 0.17 ha (0.42 ac).

IMMEDIATE RECEPTOR WITHIN 1 KM



- The project site is within Techpark 1, Bandar Enstek, an established industrial area.
- The nearest sensitive receptor is Sungai Chinchang, adjacent to the site.
- Within a 1 km radius, there are various industries, including manufacturers, research institutes, wholesalers, suppliers, and logistics companies.
- The nearest residential areas, Jentayu@Enstek and Kampung Felda LBJ, are about 2 km away.

PROJECT COORDINATE

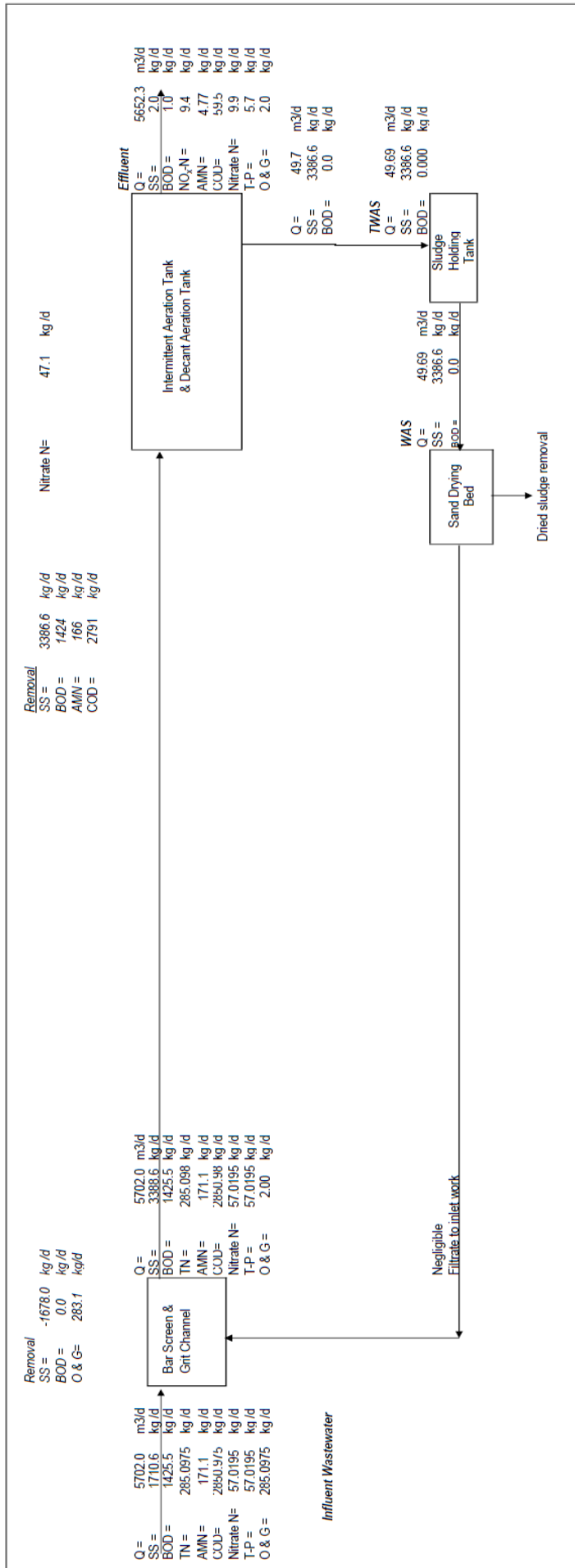


Coordinates of The Proposed Module 3		
Point	Latitude	Longitude
A	2° 44' 4.623" N	101° 45' 42.887" E
B	2° 44' 4.610" N	101° 45' 44.325" E
C	2° 44' 3.348" N	101° 45' 42.884" E
D	2° 44' 3.338" N	101° 45' 44.318" E

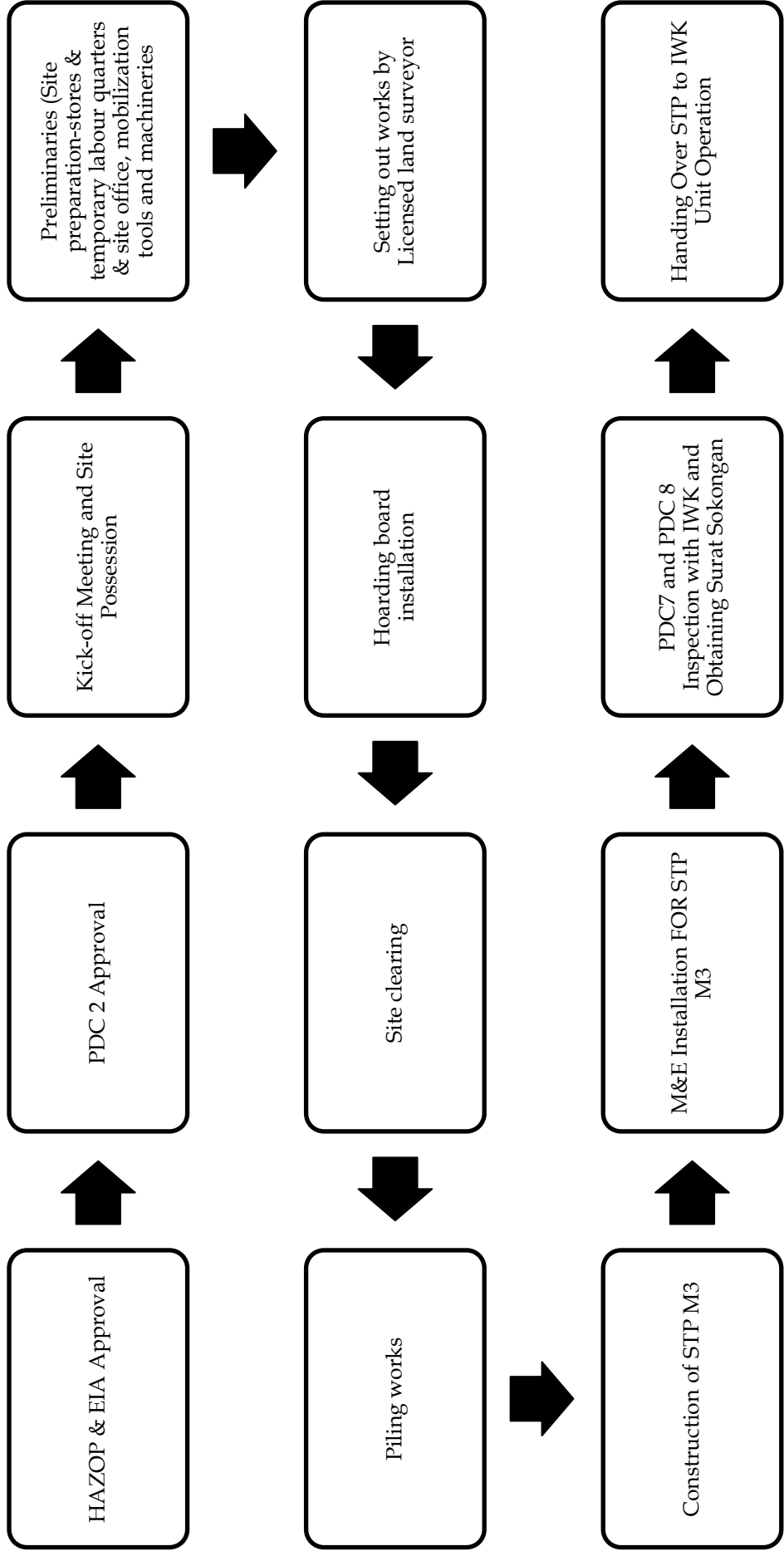
Source: Department of Survey & Mapping, 2017 & 2019

Legend	
	SEN 490
	Proposed Module 3

MASS BALANCE



SCHEMATIC FLOW DIAGRAM FOR THE PROPOSED STP



PROJECT ACTIVITY

Pre-Construction

Construction

Operation

Abandonment

Site surveying and environmental studies

- Mobilization of Workers and Equipment;
- Site Clearing and Site Preparation;
- Construction of Structure;
- Installation of Concrete Pipe Culvert;
- External works and mechanical & electrical (M&E) work; and
- Testing & Commissioning and Handing Over.

- Sewage and Discharge
- Sludge Disposal
- Facility Management

Rehab work and abandonment

EXISTING ENVIRONMENT

LANDUSE

- The industrial park is part of the planned township of Bandar Enstek.
- Nearest residential settlements: Jentayu@Enstek & Kg. Felda LBJ

CLIMATE

Meteorology Station: Sepang (2°43'53.1"N, 101°42'09.9"E)

The daily temperature for 10 years: 27.5 °C to 28.2 °C

The highest humidity was 85.0% in December, and the lowest humidity was 76.3% in February.

Average rainfall between 2014 - 2023 177.4 mm with an annual mean rain day of 15 days.

Monthly rainfall and rain days: January & February (2564.6 mm and 27 days)

HYDROLOGY

- Located within the Sg Chinchang catchment
- Surface runoff → Sg Chinchang → Sg Labu → Sg Langat → South China Sea

WIP/WTP	Distance from Project Site
Sungai Labu Water Intake	6.415 km
Sungai Labu Water Treatment Plant	4.215 km

TOPOGRAPHY

- The topography of the study area is categorized as flat landform and covered with shrub. The surrounding of the site area is covered by industrial areas, vegetation and cultivations areas

GEOLOGY

- The site area is covered mainly by a thick sequence of clastic sedimentary rocks of Kenny Hill formation.
- The lithology of the area is monotonous sequence of interbedded phyllitic shale, mudstone and thick bedded fine to medium grained sandstone
- There is a major fault located about 36.1 km away in Northeast direction of the site area known as Seremban Fault

NOISE

- Most sampling stations comply with permissible noise limits for both daytime and nighttime, indicating acceptable noise levels for suburban residential environments.
- Nighttime readings at sampling stations N2 and N3 were slightly higher than the recommended permissible sound level.
- No major activities were observed at night at any location, apart from natural sounds (e.g., nocturnal animals).

ODOUR

Sampling Location	Dilution to Threshold (D/T)						Range	Enforceable Permit Odour Limits
	Afternoon (26 th March 2024)		Night (26 th March 2024)		Morning (26 th March 2024)			
	1 st	2 nd	1 st	2 nd	1 st	2 nd		
OD1	<2	<2	<2	2	<2	2	<2 - 2	Noticeable
OD2	<2	2	2	2	<2	<2	<2	Noticeable
OD3	<2	<2	<2	<2	2	<2	<2	None
OD4	<2	<2	<2	<2	<2	<2	<2	None

AMBIENT AIR

Parameters	Results			MAAQS
	A1	A2	A3	
Particulate matter 10µm (PM ₁₀)	66	43	34	100 mg/m ³ (24 hours averaging time)
Particulate matter 2.5µm (PM _{2.5})	22	17	14	35 mg/m ³ (24 hours averaging time)
Sulphur dioxide (SO ₂)	<5	<5	<5	80 mg/m ³ (24 hours averaging time)
Nitrogen Oxide (NO ₂)	<0.5	<0.5	<0.5	70 µg/m ³ (24 hours averaging time)
Carbon monoxide (CO)	<0.5	<0.5	<0.5	10 mg/m ³ (8 hours averaging time)
Ground Level Ozone as O ₃	<5	<5	<5	100 µg/m ³ (8 hours averaging time)

The ambient air monitoring station near the project site showed readings that met MAAQS standards.

Direction	Landuse
East	FGV Innovation Centre, Biomolecular Industries Sdn. Bhd., Purecircle Sdn. Bhd., Jowat Manufacturing Sdn. Bhd., Eramas Sdn. Bhd., Mission Foods Malaysia.
South	Fresenius Medical Care Production Sdn. Bhd., Hon Chuan Malaysia Sdn. Bhd., MJ Material Technology Sdn. Bhd., Coca-Cola Bottlers Sdn. Bhd.
West	Oil palm plantation.
North	JAKIM Malaysia Halal Analysis Centre (MyHAC), Enstek Nursery, Mahawangsa Square.

VIBRATION

All vibration recorded below the limit stated in guideline

Monitoring Location	Time	Maximum RMS velocity at vertical direction, z-axis (mm/s)	Third Schedule: Recommended Vibration Limits for Human Response and Annoyance from Intermittent Vibrations (Residential)
V1	Daytime	1.148	3.2 mm/s (R=32)
	Nighttime	0.758	3.2 mm/s (R=32)
V2	Daytime	0.362	0.8 to 1.6 mm/s (R=8 to R=16)
	Nighttime	0.178	0.4 mm/s (R=4)
V3	Daytime	0.124	0.8 to 1.6 mm/s (R=8 to R=16)
	Nighttime	0.314	0.4 mm/s (R=4)

WATER QUALITY

Sampling Point	WQI	Class of Water	Status
W1	71.09	Class III	Slightly Polluted
W2	72.98	Class III	Slightly Polluted
W3	72.37	Class III	Slightly Polluted
W4	73.43	Class III	Slightly Polluted
W5	68.99	Class III	Slightly Polluted
W6	70.18	Class III	Slightly Polluted
W7	66.25	Class III	Slightly Polluted
W8	65.99	Class III	Slightly Polluted

All water sample fall under Class III

SOCIO ECONOMY

- 26 respondents (7.2%) are aware of the proposed project
- 93.6% of respondents supported the project, 6.1% give conditional support and 0.3% respondent give neutral respond

ECOLOGY	Flora	Fauna		
		Mammals	Birds	Herpetofauna
Species	31	2	6	1
Family	22	2	5	1
IUCN Red List 2023	-	1 EN	-	-
Malaysia Plant Red List	-	-	-	-
Wildlife Act 2010	-	2P	TP	-7
Endemic	-	-	-	-

P = "Protected"; EN = "Endangered"; TP = "Totally Protected"

IMPACT ASSESSMENT & MITIGATION MEASURES

PRE CONSTRUCTION STAGE

IMPACT

Impacts will be limited to designated sampling locations to assess existing site conditions. Positive impacts may include job creation for survey workers and support for associated laboratories.

MITIGATION

Employ skilled personnel for all studies.
Follow all standard requirements for sampling.
Use standard codes of practice and procedures for sampling and analysis.
Ensure safety requirements are strictly followed during sampling.

CONSTRUCTION STAGE

IMPACT

Ecology

MITIGATION

Wildlife survey (7 Jan 2025): Mammals present, but no endangered or endemic species found.
Impact of vegetation clearing: Loss of flora and natural habitats, causing disturbance to flora and fauna. No major concern, as vegetation is secondary and includes introduced species.
Biodiversity impact: Removal of vegetation will not significantly affect plant biodiversity.

- To implement all BMP proposed in LD-P2M2
- Prompt Landscaping

IMPACT

Erosion & Sedimentation

MITIGATION

Stages	Average annual soil loss(ton/ha/yr)	Soil Erosion Risk Class
Pre-construction	28.8	Moderate
Construction (Without mitigation)	133.5	High
Construction (With Mitigation)	3.3	Moderate
Post construction	0.8	Low

- Plan construction work based on LD-P2M2 document
- This involves temporary earth drain, temporary slope protection, turfing, compaction, silt trap, silt fence and temporary wash through to control erosion and sediment runoff, following the Urban Stormwater Manual (MASMA).

Soil loss is expected to remain **low** due to road pavement, buildings, and slope protection.

IMPACT

Hydrology

MITIGATION

Impact on land cover: Reduced vegetation, increased built-up area.
Hydrology effects: Higher surface runoff due to reduced infiltration, leading to greater peak storm flows.
Flood risk: Unlikely during construction, as excess runoff will flow directly into Sg. Chinchang.

- Ensure proper drainage to manage increased surface runoff due to land use changes.
- Design drains to prevent flooding, ponding, and sediment buildup during and after construction.

IMPACT

Water Quality

MITIGATION

Existing TSS levels in the river are within Class IV and Class V.
Worst-case scenario: Slight increase in TSS, but remains in the same class.
With mitigation (50 mg/L TSS limit): TSS levels align with baseline conditions, with some reduction due to dilution.

- Establish silt traps and temporary drainage systems. Maintain BMPs, provide portable toilets, and ensure no direct discharge of pollutants into water bodies.
- All waste and spills are to be managed as per DOE regulations.

IMPACT

Air Quality

MITIGATION

ID.	Sensitive receptors	Distance (km)	Existing Baseline (µg/m ³)	Incremental concentration		Cumulative Ambient Air Concentration		Ambient air quality standard Standard (2020) (µg/m ³)
				24-hour average (µg/m ³)	Annual average (µg/m ³)	24-hour average (µg/m ³)	Annual average (µg/m ³)	
A2	Kg. FELDA LBJ	1.7	43	0	0	43	-	24-hour -100 Annual -40
A3	Jentayu Esntek	1.12	34	0	0	34	-	
A2	Kg. FELDA LBJ	1.7	43	0	0	43	-	24-hour -100 Annual -40
A3	Jentayu Esntek	1.12	34	0	0	34	-	

- Maintaining buffer zones, and ensuring vehicle wheel-washing facilities.
- Open burning is prohibited, and vehicles are covered during material transport.

Without Mitigation Measures

With Mitigation Measures

CONSTRUCTION STAGE

IMPACT

Noise

MITIGATION

Noise Sensitive Receptor	Existing Noise Level, L_{Aeq} (dB(A))	Predicted Noise Level, L_{Aeq} (dB(A))	Cumulative Noise Level, L_{Aeq} (dB(A))	Incremental Noise Level (dB(A))	Anticipated Community Response (Impact)	Permissible Sound Level, L_{Aeq} (dB(A))
N2	57	40.26	57.09	0.09	None	$L_{10} - 75$
N3	60.2	41.58	60.26	0.06	None	$L_{max} - 90$

- Maintenance of Natural Buffer Zones
- Limitation of Noisy Activities
- Regular Inspection and Maintenance
- Equipment Shutdown
- Personal Protective Equipment (PPE)

The difference between the noise levels is less than 3 dB and can be classified as **not significance**.

IMPACT

Waste Management

MITIGATION

This Project is expected to produce various types of waste, including biomass, construction debris, solid waste from packaging materials and worker activities, scheduled waste, and sewage from on-site toilets.

- Biomass, solid waste, and scheduled waste will be segregated, stored properly, and disposed of at licensed facilities.
- Open burning of waste is prohibited.

TOTAL BIOMASS
175.11 t/ha

above-ground biomass: 152.00 t/ha
below-ground biomass: 23.11 t/ha



Estimated 10 workers will be on-site (peak time), generating approximately 8 kg of domestic waste per day (based on 0.8 kg per person)

IMPACT

Safety and Health

MITIGATION

- Foreign workers may be perceived as a safety and health risk to the local community.
- Construction site accidents can result from poor safety provisions, inadequate supervision, and human error.

- Establishment of a Project site Occupational Health and Safety committee as required by legislation, chaired by the Project Manager (or delegate) with representatives from all personnel levels.
- All personnel shall attend safety and health induction training prior commencing work on site.

IMPACT

Traffic

MITIGATION

- Temporary increase in heavy vehicle traffic, mainly for transporting machinery (excavators, bulldozers, compactors, etc.).
- Affected Roads: Persiaran Teknologi 1 → Federal Route 1266 / Jalan FELDA LB Johnson → Jalan Besar Salak.

- Daytime operations only, avoiding peak hours.
- Planned routes to bypass residential areas.
- Scheduled machinery use to prevent disruptions.
- Traffic control, warning signs, and load monitoring.
- Covered transport and driver compliance enforcement.

IMPACT

Socioeconomic & Social Impact

MITIGATION

Potential Positive Impact	
Business Opportunities	Opportunity for local businesses to supply construction materials throughout the construction phase.
Job Creation	Short-term employment opportunities for construction workers.
Economic Growth	Increase revenue of surrounding local businesses.
Potential Negative Impact	
Quality of the Surrounding Environment	No impact during the construction phase.
Health and Safety	No impact during the construction phase.
Social Cohesion	Influx of foreign workers may create an uncomfortable feeling among the locals.

•Quality of Surrounding Environment

•Social Cohesion

•Health and Safety

Community Management Unit: A community management unit is to be established before starts. This unit is responsible for receiving and evaluating grievances and expectations from the surrounding communities. This unit also shall arrange for a fast response to solve any raised issues from the locals.

Best Management Practices (BMPs): Project proponent is required to conduct BMPs so that the adverse impact can be minimized and localized. Project proponent to ensure the construction contractor implemented the practice throughout the development phase.

OPERATION STAGE

IMPACT

Air Quality

MITIGATION

- STP operation has no significant air emissions.
- Minimal emissions come from worker vehicles, but their impact is negligible.
- Overall, no significant environmental effects on air quality.

- No significant air quality impact, so no specific mitigation needed.
- Regular vehicle servicing to ensure emissions stay within regulatory limits.

IMPACT

Odour

MITIGATION

- Odour concentrations near the STP range from 2 ou/m³ to 0.02 ou/m³, well below the 7 ou/m³ threshold in the draft Odour Regulations.
- No significant odour pollution detected in nearby residential areas (Kg. FELDA LBJ & Jentayu Enstek).
- Overall, odour impact is within acceptable limits and does not cause a nuisance.

- Ensure efficient plant performance; and
- Carry out periodic maintenance and inspection;

IMPACT

Water Quality

MITIGATION

- No significant impact on Sg. Chinchang and Sg. Labu due to dilution.
- BOD and AN may increase but will improve further downstream.
- STP failure scenario: WIP Sg. Labu will experience significant pollution due to excessive loading and lack of dilution.

- The effluent discharged from the STP must conform to the strict limits outlined in Standard A, as prescribed by the Department of Environment (DOE).
- An early warning system, SCADA (Supervisory Control and Data Acquisition), and telemetry will be installed. In the event of a power failure, a dedicated DC/UPS (Direct Current/Uninterruptible Power Supply) will be in place to sustain SCADA operation for a minimum of six hours.

IMPACT

Noise Level

MITIGATION

- Noise levels depend on design, scale, and location.
- Blowers/diffusers may generate noise but modern and well-maintained equipment minimizes noise impact.
- Overall, operational noise impact is insignificant.

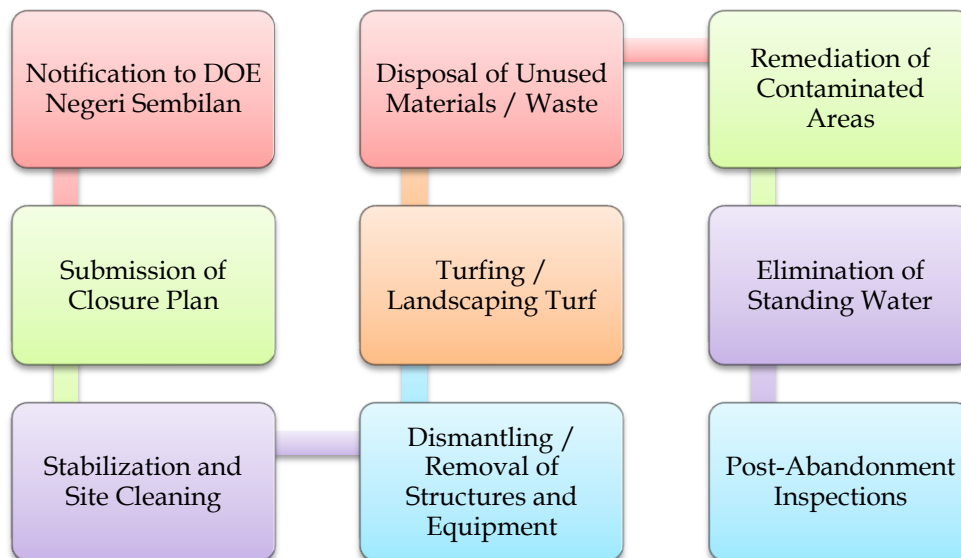
- Enclosed Blower Housing
- Anti-Vibration Mounts
- Buffer Zone with Tree Planting

IMPACT

ABANDONMENT STAGE

Issues	Impacts
Soil Erosion and Sedimentation	<ul style="list-style-type: none"> • Soil erosion at the cut and fill area, especially during heavy rainfall; • Sedimentation and water pollution at nearby water bodies
Water quality	<ul style="list-style-type: none"> • Silt runoff will increase the TSS and turbidity levels of nearby water bodies; • Deterioration of water quality of nearby water bodies due to ingress and accumulation of construction materials via surface runoff
Socio-Economic	<ul style="list-style-type: none"> • Loss of employment opportunity • Loss of business opportunity

MITIGATION








PERFORMANCE MONITORING


No	Type of P2M2	Parameter	Standard/ Recommendations	Frequency
1.	Runoff Management Control			
	Earth Drain	-	Remove accumulated silt when drain is 2/3 filled.	Weekly & after rainfall event or rainfall reading ~ 12.5 mm.
	Check Dam	-	Desilt when sediment reaches 1/3 of dam height.	Weekly & after rainfall event or rainfall reading ~ 12.5 mm.
2.	Erosion Control			
	Turfing	-	Do not mow until turf is rooted.	Water daily during the first week, unless rainfall is sufficient.
	Surface Roughening	-	Reseed or rework area as needed.	Periodically check the slopes of rills, gullies, and washes.
	Plastic Sheet/Geotextile/Blanket	-	Re-anchor and replace damaged plastic sheets.	weekly and after every significant rainfall
3.	Sediment Control			
	Washtrough	-	Periodically remove sediment.	Weekly & after rainfall event or rainfall reading ~ 12.5 mm.
	Silt Fence	-	Repair bulges or desilt when sediment reaches 1/3 of fabric height.	Weekly & after rainfall event or rainfall reading ~ 12.5 mm.
	Check Dam	-	Desilt when sediment reaches 1/3 of dam height.	Weekly & after rainfall event or rainfall reading ~ 12.5 mm.
	Silt Trap	TSS: 50 mg/l Turbidity: 50 NTU	Remove sediment after heavy rain or when basin is 1/2 full.	Weekly & after rainfall event or rainfall reading ~ 12.5 mm.
4.	Tracking Control			
	Stabilized Construction Entrance	-	Inspect and clean sediment traps after rainfall.	Regularly

COMPLIANCE MONITORING DURING CONSTRUCTION

IMPACT MONITORING DURING CONSTRUCTION


 SILT TRAP	 WATER QUALITY	 AIR QUALITY	 AMBIENT NOISE	 VIBRATION
<input type="checkbox"/> 1 Stations <input type="checkbox"/> Monthly <input type="checkbox"/> EIA Approval Conditions	<input type="checkbox"/> 4 Stations <input type="checkbox"/> Monthly <input type="checkbox"/> National Water Quality Standard (NWQS)	<input type="checkbox"/> 3 Stations <input type="checkbox"/> Quarterly <input type="checkbox"/> Malaysian Ambient Air Quality Standard (2020)	<input type="checkbox"/> 3 Stations <input type="checkbox"/> Quarterly <input type="checkbox"/> Guidelines for Environmental Noise Limits and Control, Third Edition, 2021 (Reprint).	<input type="checkbox"/> 3 Stations <input type="checkbox"/> Quarterly <input type="checkbox"/> Guidelines for Environmental Vibration Limits and Control, Third Edition, 2021.

COMPLIANCE MONITORING DURING OPERATION



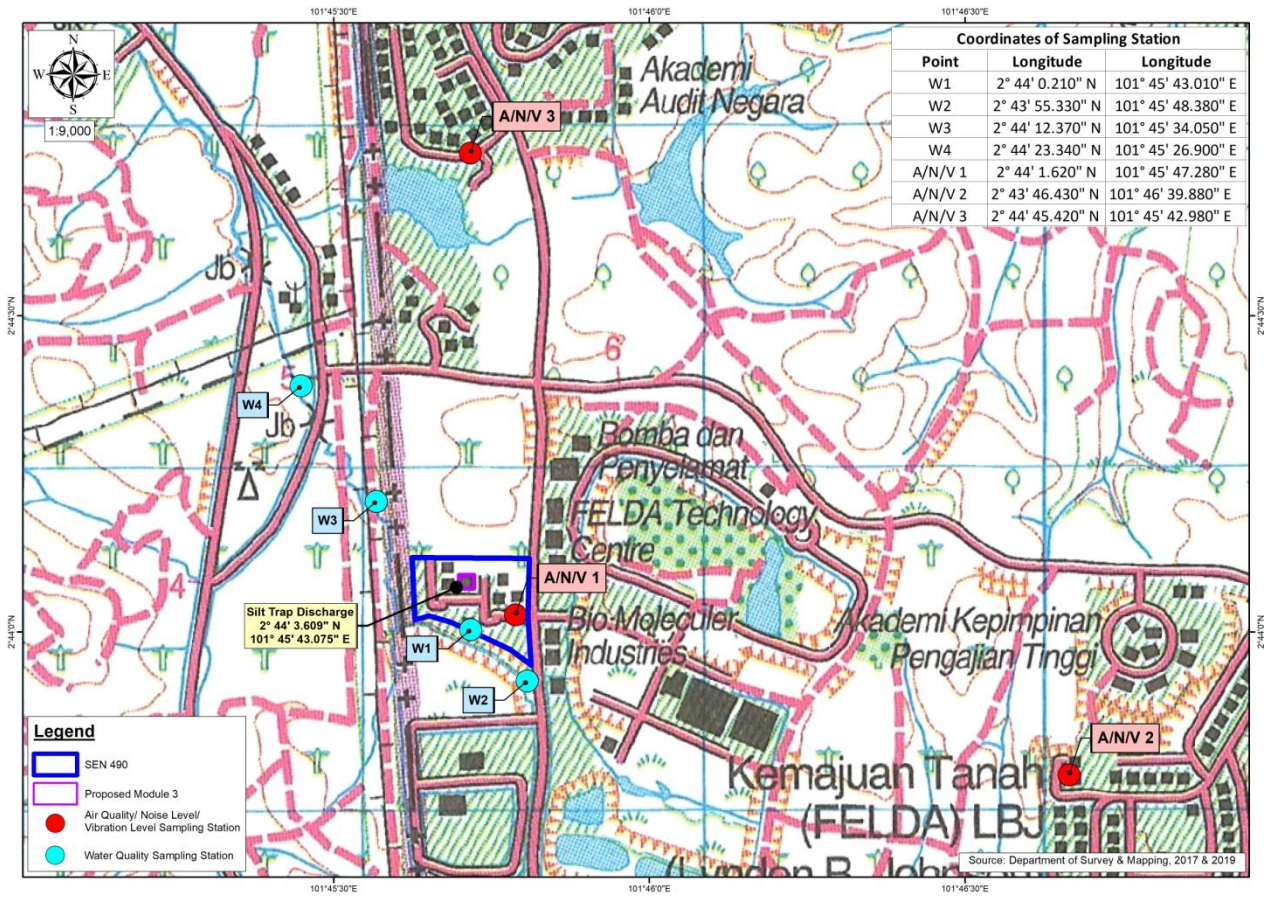
- Sewage Treatment Plant (STP) Final Discharge
- 1 station
- Monthly
- Standard A limits of the Environmental Quality (Sewage) Regulations 2009

IMPACT MONITORING DURING OPERATION

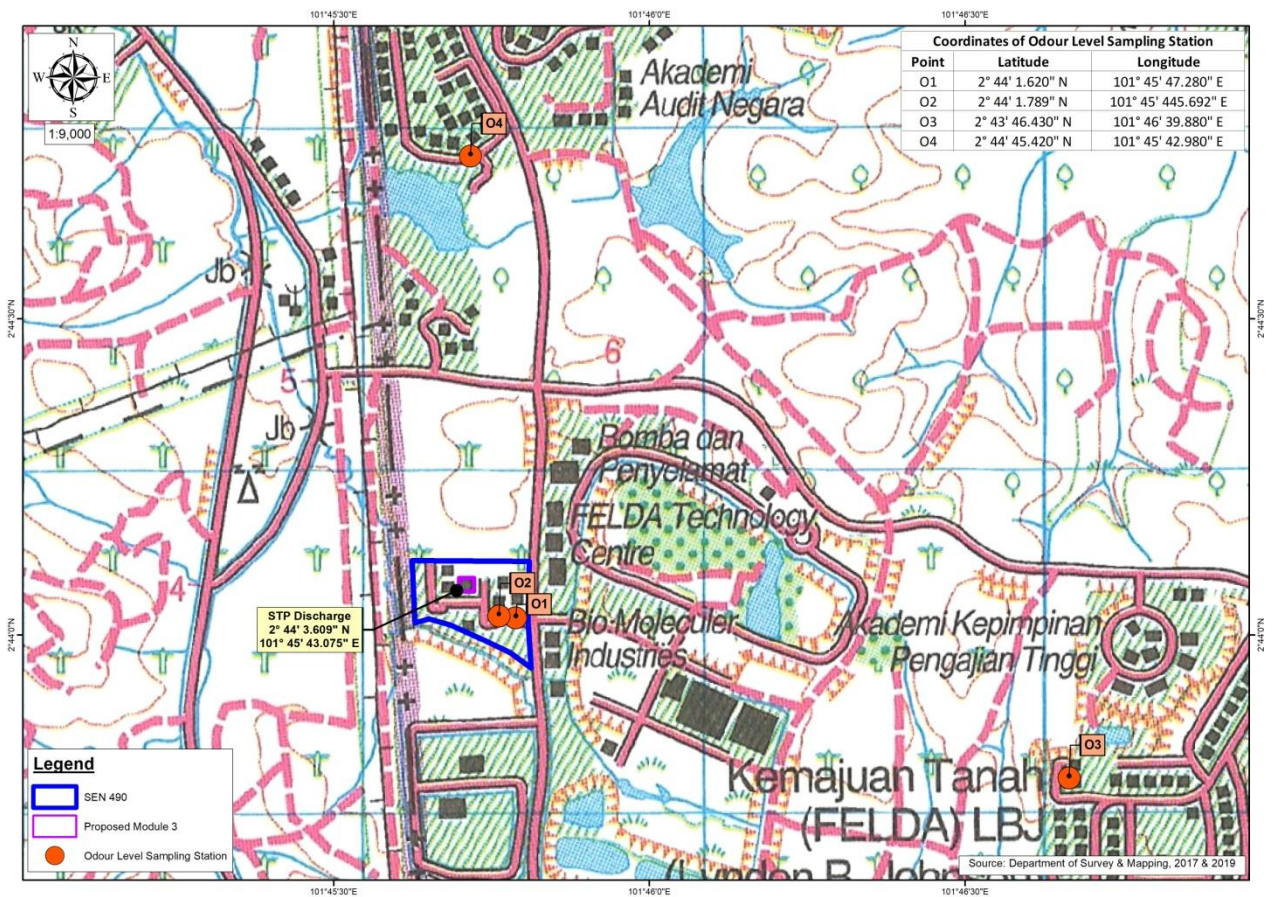


- Odour
- 4 station
- Quarterly

PROPOSED MONITORING STATION



Construction Stage



Operation Stage