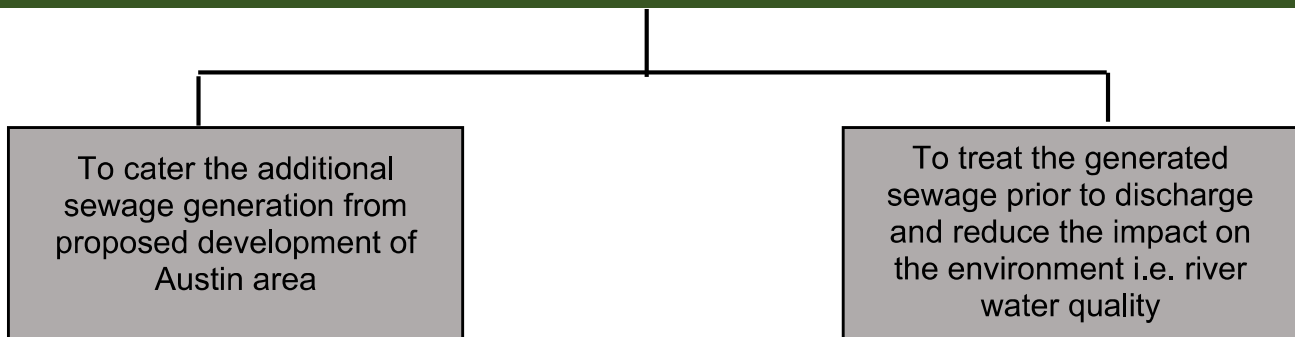


EXECUTIVE SUMMARY

PROPOSED UPGRADING OF EXISTING SEWAGE TREATMENT PLANT (3RD MODULE: 29,000 PE, ULTIMATE: 63,000 PE) ON PART OF PTD 202970, MUKIM TEBRAU, DAERAH JOHOR BAHRU, JOHOR DARUL TA'ZIM

| PROJECT PROPONENT | EIA CONSULTANT |
|--|---|
| Austin Senibong Development Sdn. Bhd Mr. Chan Wei Chun (Director) | Enviro Pioneer Solutions Dr. Ng Pang Soon (James) (CEP-C0116, EIA Lead Consultant) |

STATEMENT OF NEEDS



LEGISLATIVE REQUIREMENT

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

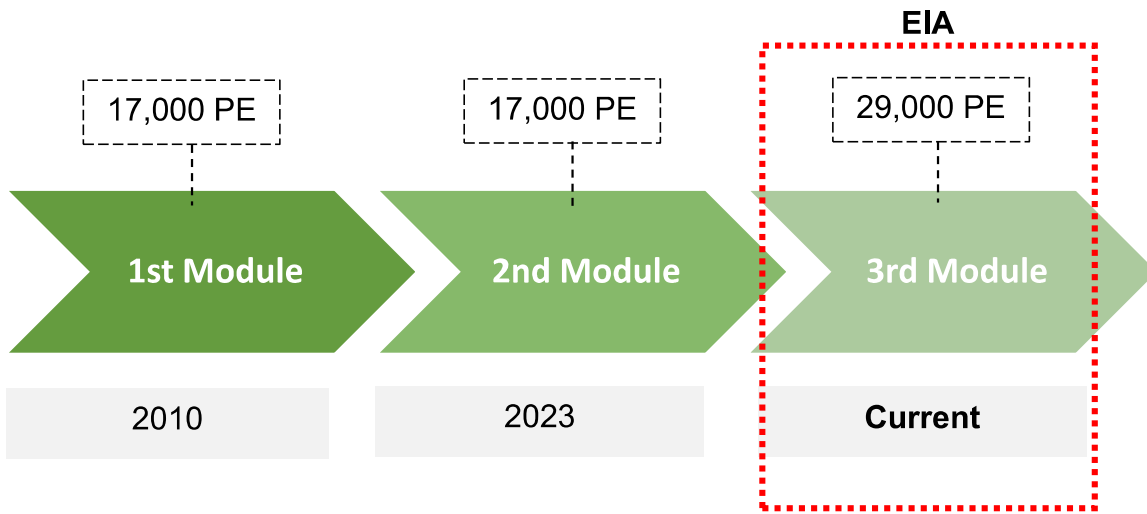
FIRST SCHEDULE

14. WASTE TREATMENT AND DISPOSAL

(c) Sewage

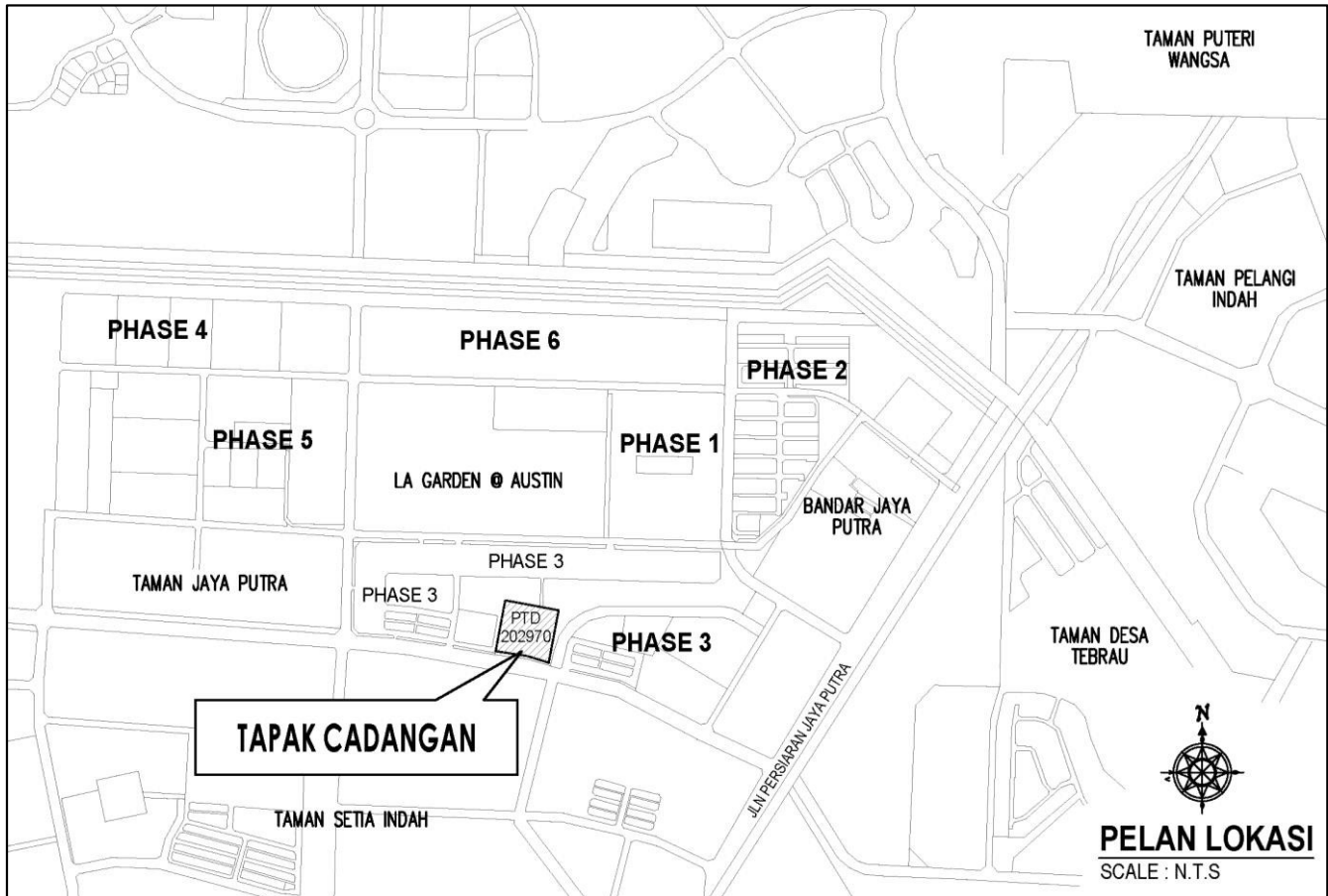
(i) Construction of sewage treatment plant with 20,000 population equivalent or more.

PROJECT BACKGROUND

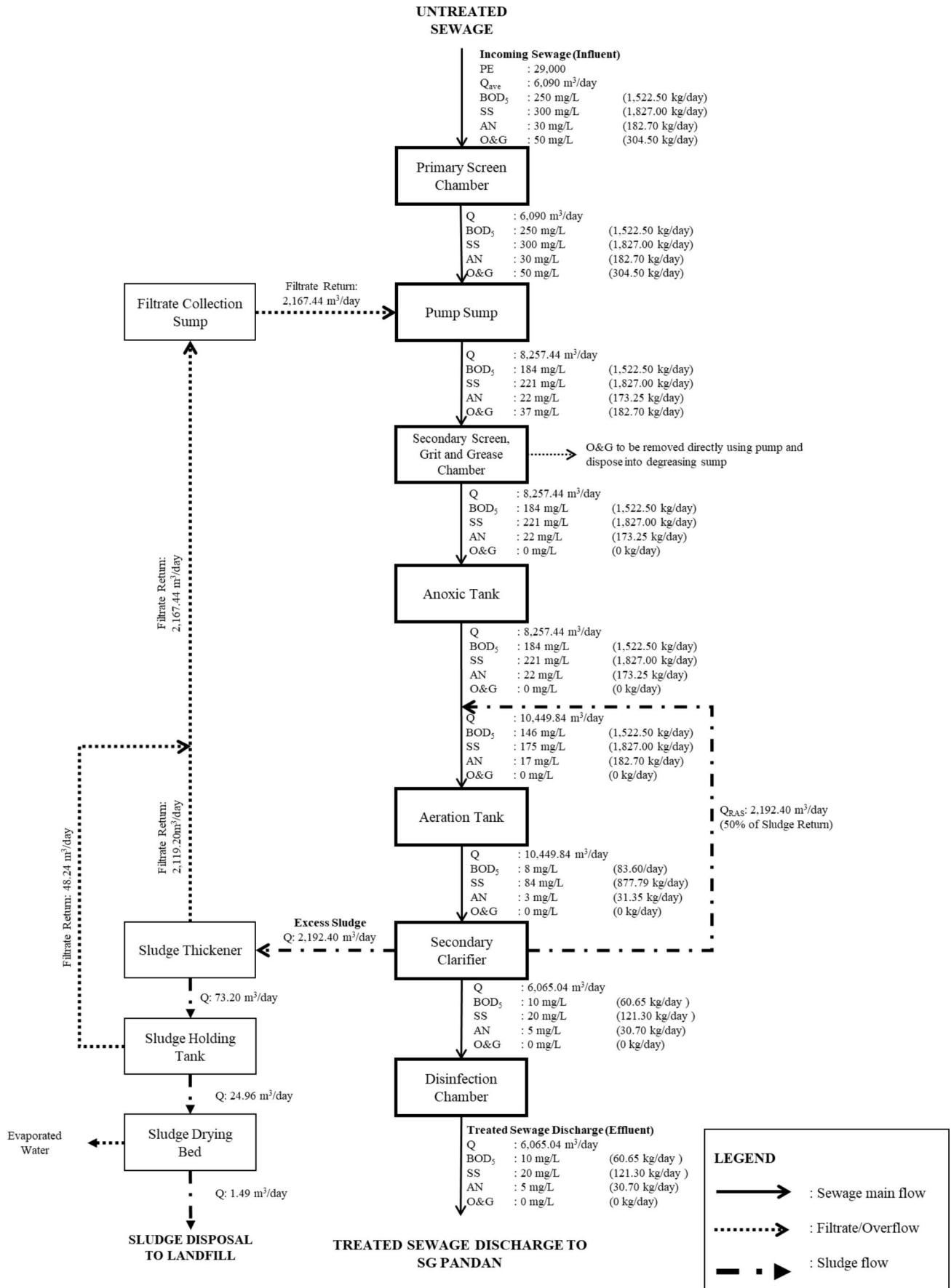


SEWAGE TREATMENT PLANT

LOCATION OF PROJECT SITE

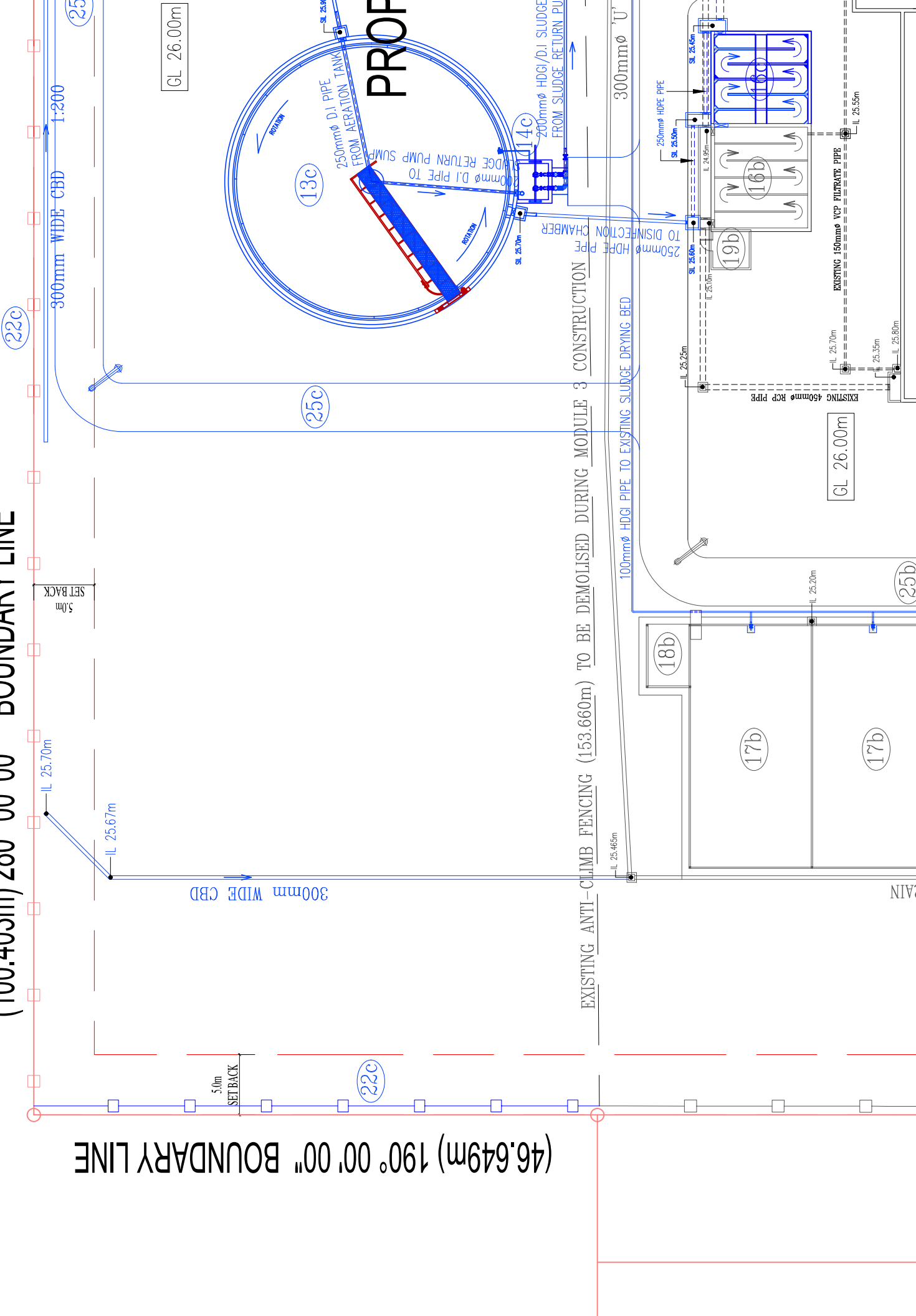


PROCESS FLOW CHART AND MASS BALANCE



(100.403m) 280° 00' 00" BOUNDARY LINE

(46.649m) 190° 00' 00" BOUNDARY LINE



DESIGN VALUE OF UNTREATED SEWAGE

| Parameter | Concentration (mg/L) |
|---------------------------------|----------------------|
| Biochemical Oxygen Demand (BOD) | 250 |
| Suspended Solids (SS) | 300 |
| Chemical Oxygen Demand (COD) | 500 |
| Ammoniacal Nitrogen (AN) | 30 |
| Oil and Grease (O&G) | 50 |

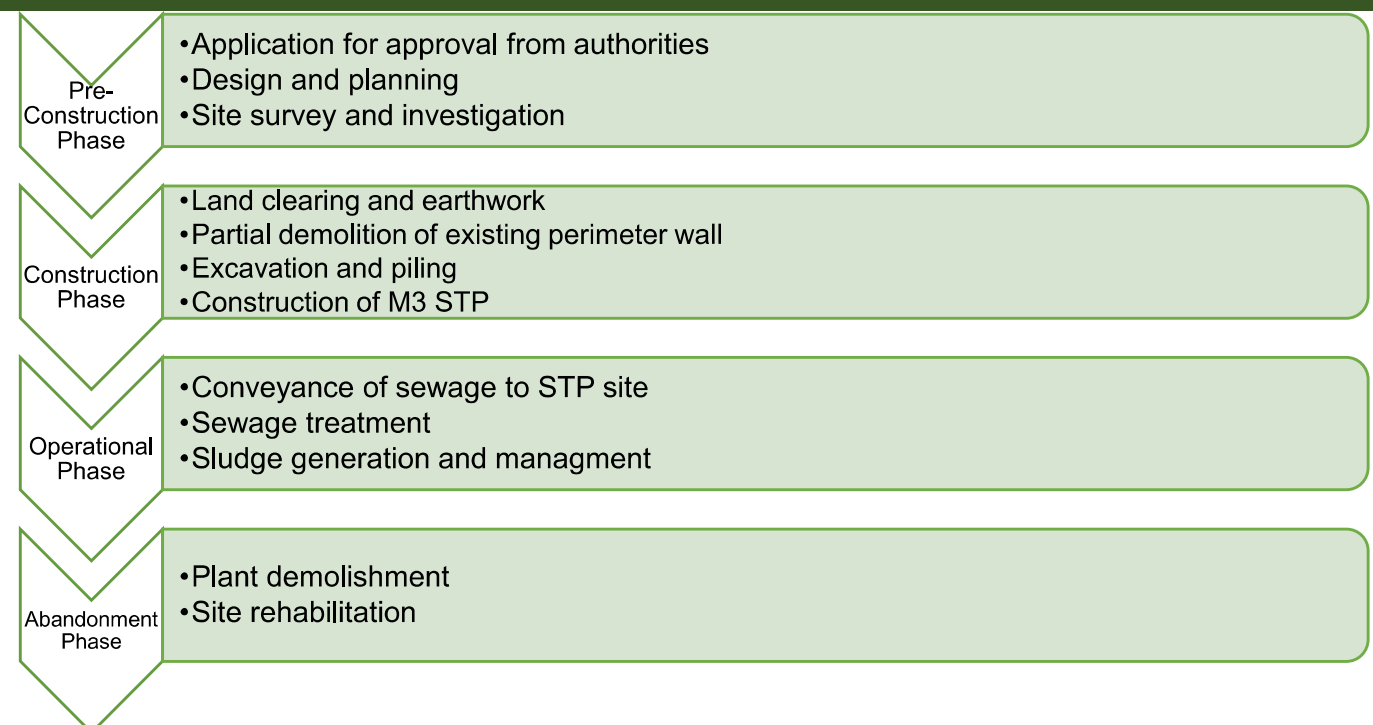
Source: Malaysian Sewerage Industry Guidelines, Sewage Characteristics and Effluent Discharge Requirement (SPAN, 2009)

ACCEPTABLE QUALITY OF TREATED SEWAGE DISCHARGE

| No. | Parameter | Unit | Discharge Limit (Standard B) |
|-----|-----------------------------|------|------------------------------|
| 1 | Temperature | °C | 40 |
| 2 | pH value | - | 5.5-9.0 |
| 3 | BOD | mg/L | 50 |
| 4 | COD | mg/L | 200 |
| 5 | Suspended solid | mg/L | 100 |
| 6 | Oil and grease | mg/L | 10 |
| 7 | Ammoniacal nitrogen (river) | mg/L | 20 |
| 8 | Nitrate-Nitrogen (river) | mg/L | 50 |

Source: Acceptable Conditions of Sewage Discharge, Environmental Quality (Sewage) Regulations, 2009

PROJECT ACTIVITIES



EXISTING ENVIRONMENT



SURROUNDING LAND USE

- Residential
- Commercial
- Industrial



AMBIENT AIR QUALITY

Air quality at all monitoring stations were below Malaysian Ambient Air Quality Standard 2020



ODOUR

- Sniff testing
 - Weak sewage odour (intensity 1) at O1 (project site) & O2 (Precinct 9 Setia Indah)
 - No odour at O3 (LA Garden @ Austin)
- H₂S concentration
 - 2.3 µg/m³ at O1 (project site)
 - < 2 µg/m³ (odour threshold) at O2 (Precinct 9 Setia Indah) & O3 (La Garden @ Austin)



CLIMATE AND METEOROLOGY

Data obtained from Senai Airport Meteorological Station

| | |
|------------------------|--|
| Mean monthly rainfall | 125.2 – 324.8 mm |
| Mean monthly rain days | 9 – 22 days |
| Mean temperature | 26.6 – 27.7 °C |
| Mean relative humidity | 82.0 – 87.5 % |
| Wind pattern | <ul style="list-style-type: none"> • Predominantly from north • Mean speed 1.5 m/s |



NOISE

Noise level at all monitoring stations were below permissible limit

| Duration | L _{Aeq} | Permissible L _{Aeq} * |
|-----------|------------------|--------------------------------|
| Daytime | 47.8 – 58.4 dBA | 65 dBA |
| Nighttime | 40.7 – 46.1 dBA | 60 dBA |





* Second Schedule, Guidelines for Environmental Noise Limit and Control for Environment (DOE, 2019)




SURFACE WATER QUALITY

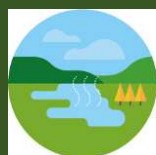
- Compared with NWQS for Malaysia
- Water quality index (WQI) at Sg. Pandan ranged from Class III – Class IV

IMPACT ASSESSMENT AND P2M2 DURING CONSTRUCTION PHASE

|  NOISE LEVEL | <p><u>Impact Assessment</u> The project will be using hydraulic piling</p> <table border="1" style="width: 100%; border-collapse: collapse; margin: 10px 0;"> <thead> <tr> <th style="text-align: center;">Distance from piling site</th> <th style="text-align: center;">Estimated noise level (dBA)</th> </tr> </thead> <tbody> <tr> <td>10 m (source)</td> <td style="text-align: center;">89</td> </tr> <tr> <td>170 m (Precinct 9 Setia Indah)</td> <td style="text-align: center;">64</td> </tr> <tr> <td>230 m (LA Garden @ Austin)</td> <td style="text-align: center;">62</td> </tr> </tbody> </table> <p><i>Permissible noise level at residential area : 65 dBA</i></p> <p>Estimated noise level at sensitive receptors are within permissible noise level</p> | Distance from piling site | Estimated noise level (dBA) | 10 m (source) | 89 | 170 m (Precinct 9 Setia Indah) | 64 | 230 m (LA Garden @ Austin) | 62 |
|--|--|---------------------------|-----------------------------|-------------------------------|-------------------|--------------------------------|------------------|----------------------------|----|
| Distance from piling site | Estimated noise level (dBA) | | | | | | | | |
| 10 m (source) | 89 | | | | | | | | |
| 170 m (Precinct 9 Setia Indah) | 64 | | | | | | | | |
| 230 m (LA Garden @ Austin) | 62 | | | | | | | | |
|  SOIL EROSION AND SEDIMENTATION | <p><u>Proposed P2M2</u></p> <ul style="list-style-type: none"> Piling and construction works shall be confined to daytime only All equipment and machinery shall be properly lubed and maintained for smooth operation Noise barrier (i.e. hoarding) should be erected to reduce noise pollution to surrounding sensitive receptor | | | | | | | | |
|  NOISE LEVEL | <p><u>Impact Assessment</u> Soil erosion rate, A:</p> <table style="width: 100%; margin: 10px 0;"> <tbody> <tr> <td style="padding-right: 20px;">• Existing condition</td> <td style="text-align: right;">: 17.32 ton/ha/yr</td> </tr> <tr> <td style="padding-right: 20px;">• Development without LD-P2M2</td> <td style="text-align: right;">: 90.23 ton/ha/yr</td> </tr> <tr> <td style="padding-right: 20px;">• Development with LD-P2M2</td> <td style="text-align: right;">: 2.26 ton/ha/yr</td> </tr> </tbody> </table> <p>With LD-P2M2 implementation, the soil erosion rate is lower than the existing condition</p> | • Existing condition | : 17.32 ton/ha/yr | • Development without LD-P2M2 | : 90.23 ton/ha/yr | • Development with LD-P2M2 | : 2.26 ton/ha/yr | | |
| • Existing condition | : 17.32 ton/ha/yr | | | | | | | | |
| • Development without LD-P2M2 | : 90.23 ton/ha/yr | | | | | | | | |
| • Development with LD-P2M2 | : 2.26 ton/ha/yr | | | | | | | | |
|  SOIL EROSION AND SEDIMENTATION | <p><u>Proposed P2M2</u></p> <ul style="list-style-type: none"> Implement and maintain LD-P2M2 | | | | | | | | |

| | |
|--|--|
|  <p>WASTE GENERATION</p> | <ul style="list-style-type: none"> • Spoil <ul style="list-style-type: none"> - Generated from earthwork and excavation activities - Quantity: approximately 18,000 m³ - Will be send to Austin development area, Phase 3E with travelling distance approximately 700 m from the project site |
| | <ul style="list-style-type: none"> • Construction waste <ul style="list-style-type: none"> - Generated from the demolition of the anti climb fencing and concrete perimeter wall - Anti climb fencing (metals) will be sent for recycling - Concrete waste will be disposed at designated disposal site |
| | <ul style="list-style-type: none"> • Open burning is prohibited |
| | <ul style="list-style-type: none"> • Minimum scheduled waste i.e. hydraulic oil and spent lubricant from maintenance of construction machinery <ul style="list-style-type: none"> - Management in accordance with the Environmental Quality (Scheduled Wastes) Regulations 2005 |

IMPACT ASSESSMENT AND P2M2 DURING OPERATIONAL PHASE



SURFACE WATER QUALITY

Impact Assessment (Surface Water Quality Modelling)

- Insignificant volume of discharge sewage
 - Ratio of discharge sewage to Sg Pandan (at W5) only 0.03
- STP helps to remove pollutants in the generated sewage from surrounding land use
 - Mitigates the impact of sewage discharge on the quality of surface water
- Study methodology: QUAL2K Modelling

QUAL2K Modelling



- Modelling Parameters
 - BOD
 - COD
 - Ammoniacal nitrogen (AN)
 - TSS
 - NO⁻³
 - P
 - E-coli
 - O&G
 - DO

Modelling result

- During normal flow
 - Discharge from 3rd Module contributes insignificant impact to Sg Pandan at 6 km downstream from STP
- Worst-case (raw sewage discharge from 3rd Module + 7Q10 low flow)
 - Increase of pollutants in Sg. Pandan at 6 km downstream from STP

Proposed P2M2

- Avoid failure at the STP treatment
- Ensure the treated sewage discharge complies with the Environmental Quality (Sewage) Regulations 2009

| | |
|--|---|
|  <p>ODOUR</p> | <p><u>Impact Assessment (Odour Dispersion Modelling)</u></p> <ul style="list-style-type: none"> • Using AERMOD (USEPA Guideline on Air Quality Models) • Normal scenario: <ul style="list-style-type: none"> - Odour levels at site boundary and sensitive receptor based on predicted H₂S < odour nuisance levels 7 OU (DOE Guidelines 2013) • Worst-case scenario (95% higher) <ul style="list-style-type: none"> - Odour level at project site and sensitive receptor > 7OU but H₂S concentration is much lower than the limit stated in Arizona Ambient Air Quality Guidelines |
|  <p>WASTE MANAGEMENT</p> | <p><u>Proposed P2M2</u></p> <ul style="list-style-type: none"> • To ensure sufficient oxygen system to the treatment system to avoid anaerobic condition which can cause odour generation • To manage and dispose sludge according to schedule to avoid extended storage which may cause biodegradable degradation that may cause odour <ul style="list-style-type: none"> • Solid waste <ul style="list-style-type: none"> - Approximately 25 m³/day of wet sludge generation - Collected by IWK desludging truck and disposed of to Jemaluang Landfill • Scheduled Waste <ul style="list-style-type: none"> - Minimum scheduled waste from the maintenance of STP components i.e. pump, aerator and etc. - Management in accordance to the Environmental Quality (Scheduled Wastes) Regulations 2005 and |




PERFORMANCE MONITORING PROGRAM (OPERATIONAL PHASE)

| Process Unit / Location | Parameter | Frequency | Setting Range | Monitoring Method |
|-----------------------------------|-----------|-----------|---------------|------------------------|
| Existing flow measurement chamber | Flowrate | Daily | Peak flow | Open channel flowmeter |
| Aeration tank | DO | Daily | 2 mg/L | DO Meter |
| Disinfection chamber | Flowrate | Daily | Peak flow | Open channel flowmeter |



COMPLIANCE MONITORING PROGRAM

| Environmental Component | Monitoring Parameter | Monitoring Location | Monitoring Frequency | Compliance Requirement |
|---------------------------|--|--------------------------------|---|--|
| CONSTRUCTION PHASE | | | | |
| Sediment Basin Discharge | <ul style="list-style-type: none"> TSS Turbidity | Sediment basin discharge point | Monthly | <ul style="list-style-type: none"> TSS: 50 mg/L Turbidity: 250 NTU |
| OPERATIONAL PHASE | | | | |
| Sewage Discharge | 8 parameters per stipulated in the Environmental Quality (Sewage) Regulations 2009, Standard B | Treated sewage final discharge | Weekly (monthly submission of monitoring report to DOE via online environmental system (OER)) | Standard B, Acceptable Conditions of Sewage Discharge, Environmental Quality (Sewage) Regulations 2009 |

IMPACT MONITORING PROGRAM (CONSTRUCTION PHASE)

| Environmental Component | Monitoring Parameter | Monitoring Location | Station Description | Monitoring Frequency | Compliance Requirement |
|---|---|--|---|----------------------|---|
|  Air quality | <ul style="list-style-type: none"> • PM₁₀ • PM_{2.5} | AQ1 1°34'33.62"N, 103°46'17.04"E | Precinct 9 Setia Indah | Monthly | Ambient Air Quality Standards 2020 |
| | | AQ 2 1°34'46.45"N, 103°46'18.91"E | LA Garden @ Austin | | |
|  Noise level | <ul style="list-style-type: none"> • L_{aeq} • L_{max} | NL1 1°34'33.62"N, 103°46'17.04"E | Precinct 9 Setia Indah | Monthly | Maximum Permissible Sound Levels (L _{max}) of Construction, Maintenance and Demolition Work by Receiving Land, Guideline of Noise Control and Limits 2019 |
| | | NL 2 1°34'46.45"N, 103°46'18.91"E | LA Garden @ Austin | | |
|  Surface water quality | <ul style="list-style-type: none"> • Temperature • pH • DO • BOD5 • COD • Ammoniacal Nitrogen • TSS • Turbidity • Oil and grease • E-coli | WQ 1 1°34'34.99"N, 103°46'45.88"E | <ul style="list-style-type: none"> • Upstream of STP site • Sg Pandan | Monthly | National water Quality Standard for Malaysia |
| | | WQ 2 1°34'33.49"N, 103°46'19.60"E | <ul style="list-style-type: none"> • Downstream of STP site • Sg Pandan • After receiving discharge from construction site | | |

IMPACT MONITORING PROGRAM (OPERATIONAL PHASE)

| Environmental Component | Monitoring Parameter | Monitoring Location | Station Description | Monitoring Frequency | Compliance Requirement |
|--|--|--|--|----------------------|--|
|  Odour | <ul style="list-style-type: none"> • Odour characteristic • Odour Intensity • Odour Offensiveness | OD1 1°34'33.62"N, 103°46'17.04"E | Precinct 9 Setia Indah | Monthly | Baseline level |
| | | OD 2 1°34'46.45"N, 103°46'18.91"E | LA Garden @ Austin | | |
|  Surface water quality | Parameters in the National Water Quality Standard for Malaysia | WQ1 1°34'34.99"N, 103°46'45.88"E | Upstream of project site | Monthly | National Water Quality Standard for Malaysia |
| | | WQ2 1°34'33.49"N, 103°46'19.60"E | 100 m downstream of project site after receiving treated sewage discharge | | |
| | | WQ3 1°33'55.44"N, 103°46'23.48"E | 1.3 km downstream of project site after receiving treated sewage discharge | | |