EXECUTIVE SUMMARY

PROPOSED CONSTRUCTION FOR UNSATURATED POLYESTER RESINS AND ALKYD RESINS MANUFACTURING PLANT WITH ON-SITE THERMAL TREATMENT AT PLO 83, JALAN TERUNTUM 1, TANJUNG LANGSAT INDUSTRIAL COMPLEX, 81700 PASIR GUDANG, MUKIM SUNGAI TIRAM, DAERAH JOHOR BAHRU, JOHOR DARUL TAKZIM

PROJECT PROPONENT	ENVIRONMENTAL CONSULTANT	
SHCP MALAYSIA SDN BHD	ECOCHEM ENGINEERING SDN BHD	WIRANDA (M) SDN BHD

INTRODUCTION

- Construction of Unsaturated Polyester Resin (UPR) and Alkyd Resin manufacturing plant with on-site thermal treatment using Thermal Oxidizer
- Thermal Oxidizer will treat the wastewater (SW319) before emit to the atmosphere through the stack
- No effluent to be discharged during operation (Zero Discharge)

STATEMENT OF NEED

- The manufacturers are heavily focusing on the adoption of advanced technologies to destroy toxic substances and reduce harmful emissions. This is generating noteworthy demand for thermal oxidizer among the manufacturers.
- The thermal oxidizer market was valued at USD 8.55 billion in 2019 and is projected to reach USD 11.75 billion by 2027; it is expected to grow at a CAGR (Compound Annual Growth Rate) of 4.2% from 2020 to 2027.
- To reduce air pollution by eliminating hazardous air pollutants (HAP), volatile organic compounds (VOC), and odorous emissions released by industrial processes.
- The project is in line with development policy such as National Physical Plan 4, Johor State Structure Plan 2030 and Pasir Gudang Local Plan 2030.

LEGISLATIVE REQUIREMENT

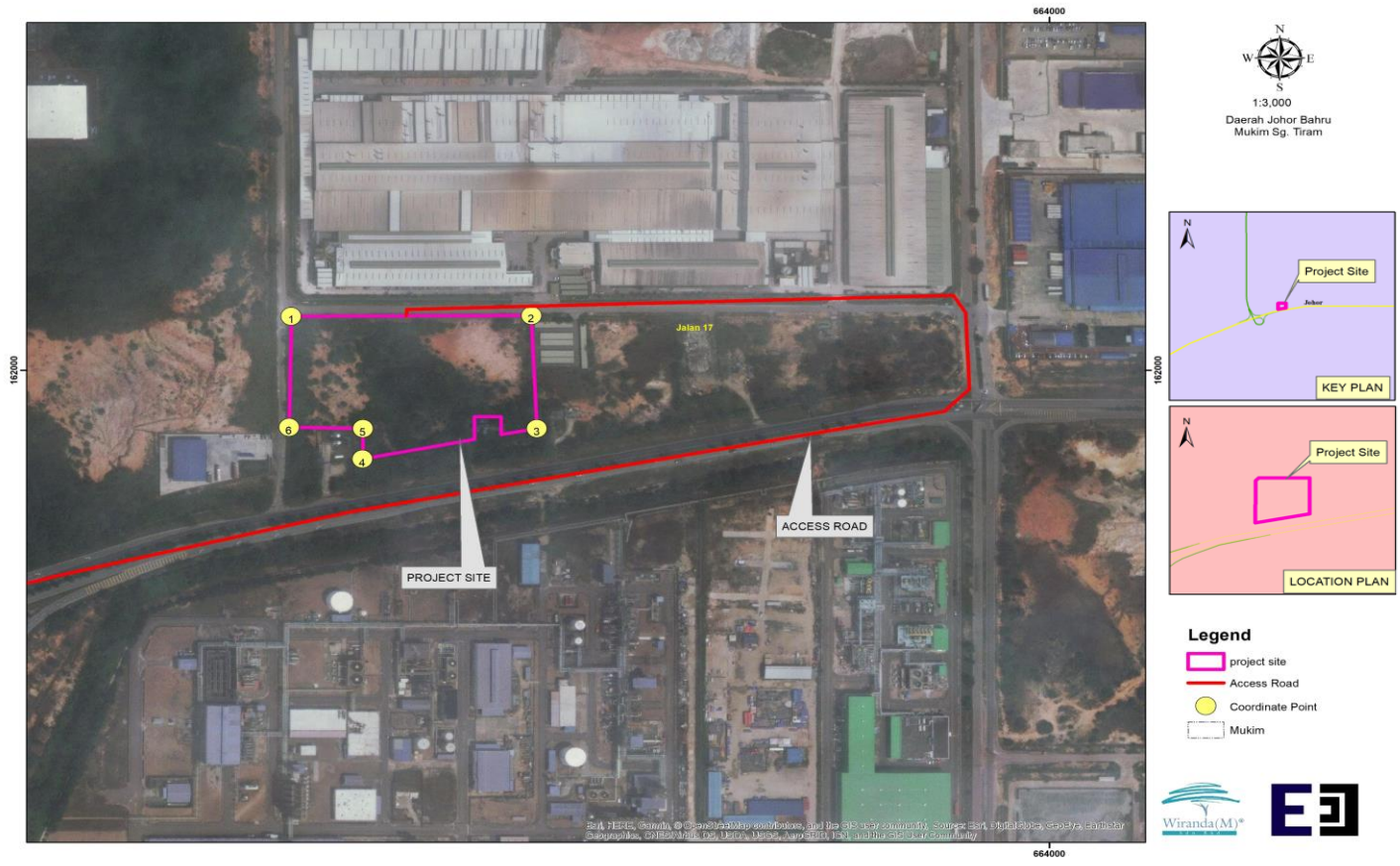
<u>Second Schedule</u>

Activity 14. Waste Treatment and Disposal

(a) Scheduled waste – (i) Construction of thermal treatment plant

PROJECT LOCATION

- Located in Tanjung Langsat Industrial Complex, Pasir Gudang, Mukim Sungai Tiram, Daerah Johor Baharu, Johor
- Nearest town is Pasir Gudang (10km from project site



EXECUTIVE SUMMARY

PROPOSED CONSTRUCTION FOR UNSATURATED POLYESTER RESINS AND ALKYD RESINS MANUFACTURING PLANT WITH ON-SITE THERMAL TREATMENT AT PLO 83, JALAN TERUNTUM 1, TANJUNG LANGSAT INDUSTRIAL COMPLEX, 81700 PASIR GUDANG, MUKIM SUNGAI TIRAM, DAERAH JOHOR BAHRU, JOHOR DARUL TAKZIM

PROJECT CONCEPT AND PROJECT COMPONENT

The proposed project will involve the construction and operation of UPR and Alkyd Resins manufacturing plant with on-site thermal treatment through thermal oxidizer with component as follows:

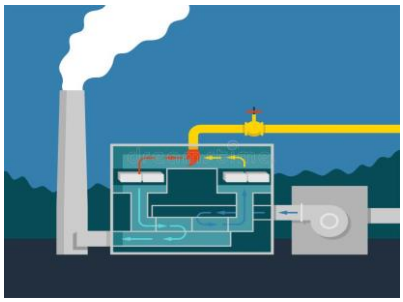
- Warehouse, office and factory
- Production tank area
- Pump Station and Pump House
- Guard House
- Main Switching Station
- Refuse chamber
- Scheduled waste storage building
- Gas metering station
- Firefighting tank

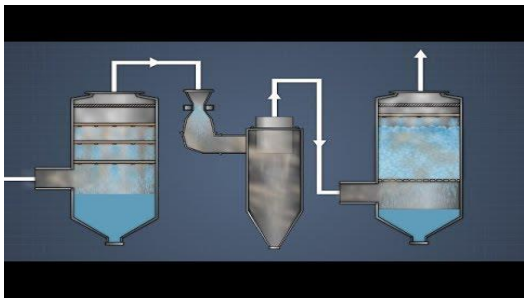
Installation of two types of Air Pollution Control Systems

- Thermal Oxidizer – treat the wastewater (SW319) before emit through stack
- Scrubber

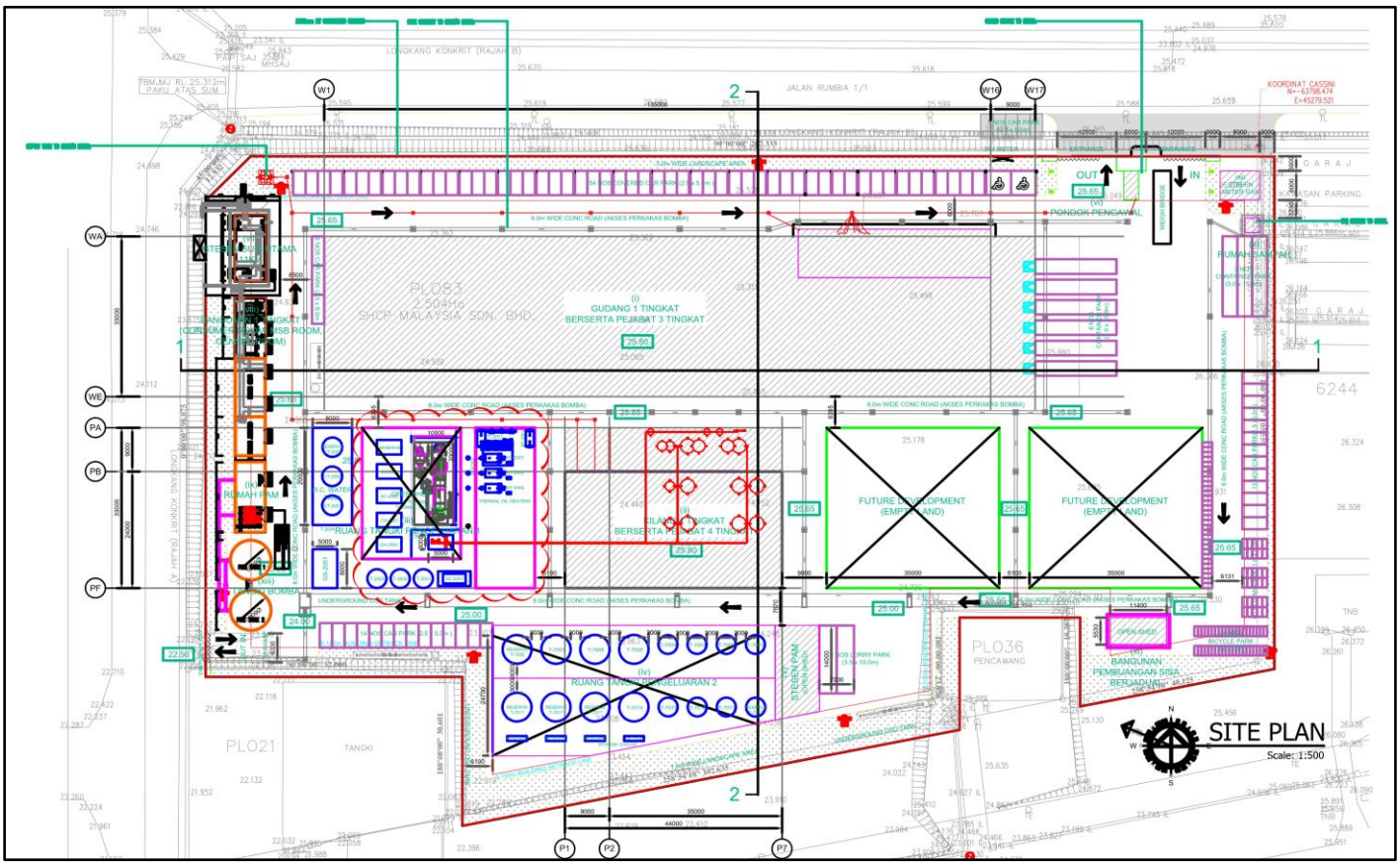
Thermal oil heater will act as fuel burning equipment for power generation

There is no effluent to be discharged during operation phase (Zero Discharge)





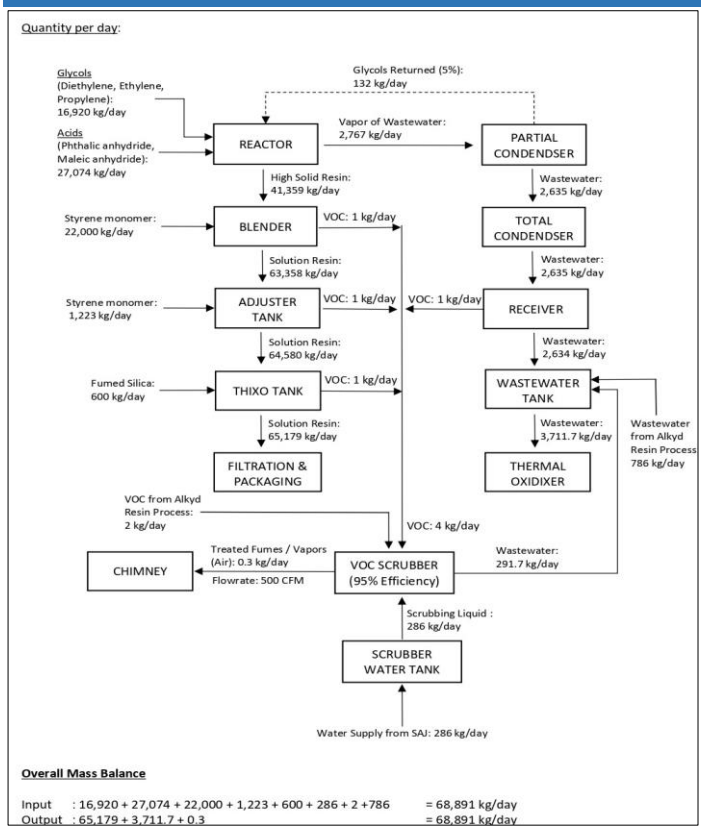
PROJECT LAYOUT



EXECUTIVE SUMMARY

PROPOSED CONSTRUCTION FOR UNSATURATED POLYESTER RESINS AND ALKYD RESINS MANUFACTURING PLANT WITH ON-SITE THERMAL TREATMENT AT PLO 83, JALAN TERUNTUM 1, TANJUNG LANGSAT INDUSTRIAL COMPLEX, 81700 PASIR GUDANG, MUKIM SUNGAI TIRAM, DAERAH JOHOR BAHRU, JOHOR DARUL TAKZIM

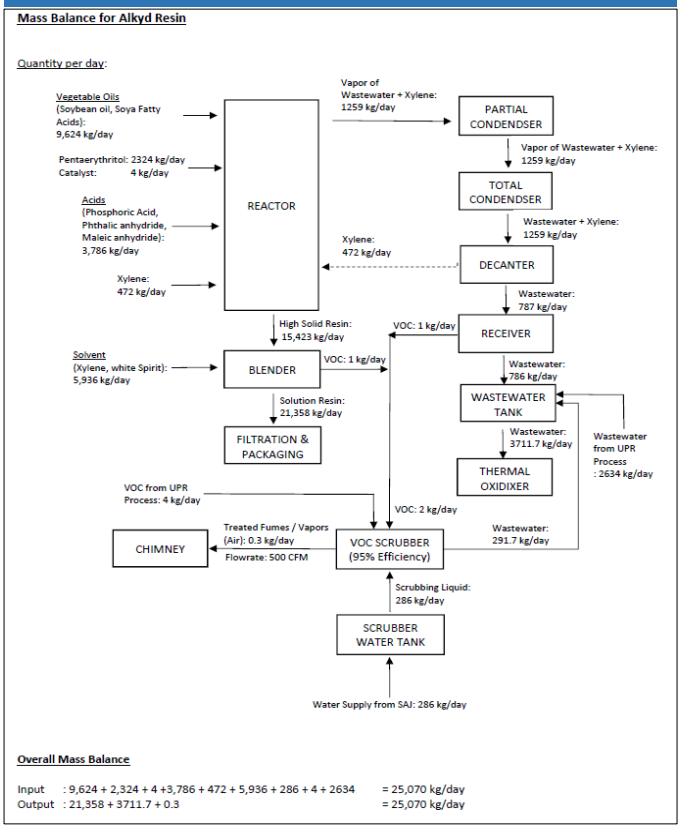
UPR RESINS PROCESS



Overall Mass Balance

Input : 16,920 + 27,074 + 22,000 + 1,223 + 600 + 286 + 2 +786 = 68,891 kg/day
Output : 65,179 + 3,711.7 + 0.3 = 68,891 kg/day

ALKYD RESINS PROCESS



Overall Mass Balance

Input : 9,624 + 2,324 + 4 +3,786 + 472 + 5,936 + 286 + 4 + 2634 = 25,070 kg/day
Output : 21,358 + 3711.7 + 0.3 = 25,070 kg/day

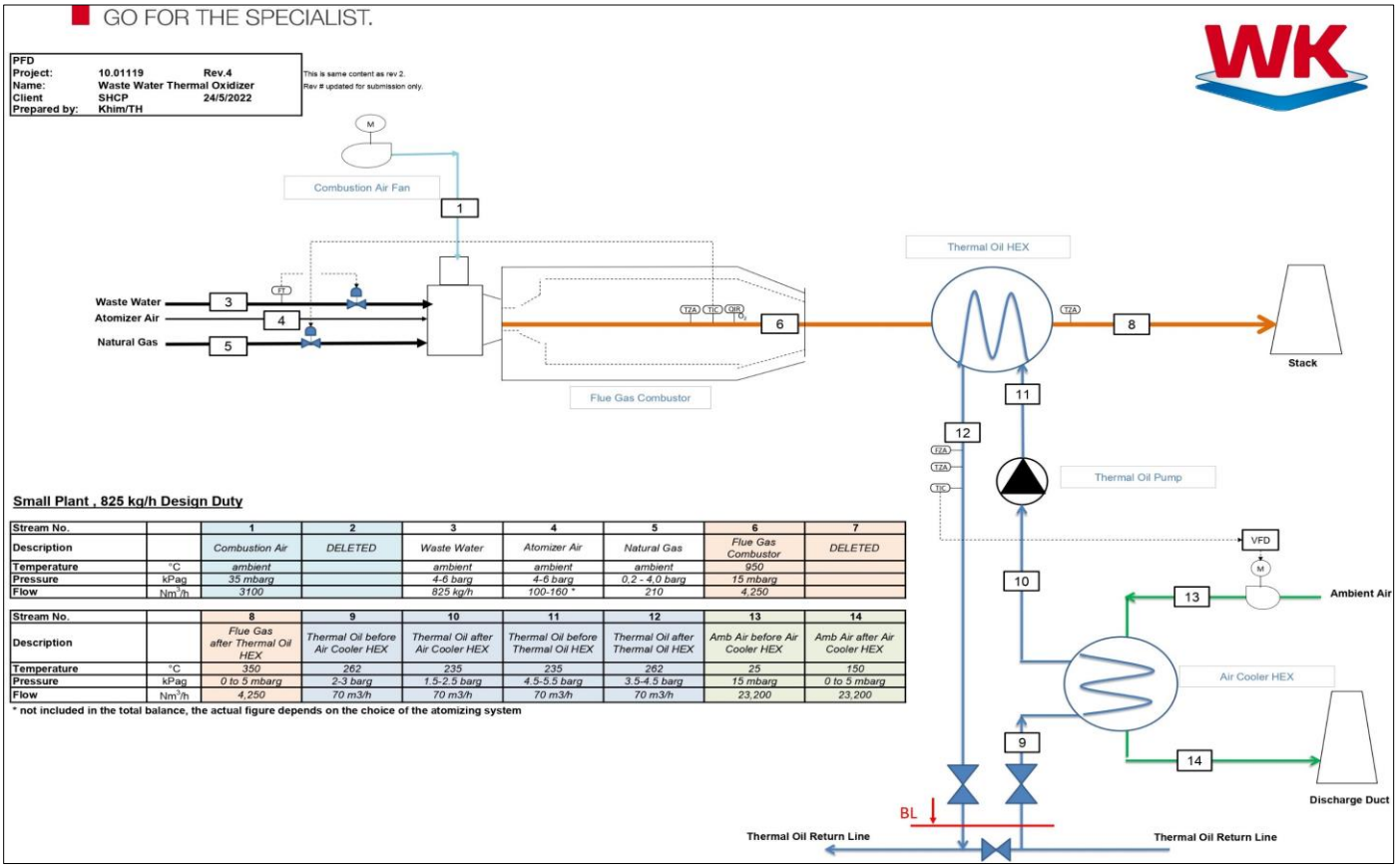
GENERATION OF SW319 DURING OPERATION PHASE

WASTE GENERATED	QUANTITY PER DAY	QUANTITY PER MONTH
UPR RESINS		
Wastewater (SW319)	2,634 kg/ day	80,117.5 kg/month
ALKD RESINS		
Wastewater (SW319)	786 kg/day	23,907.5 kg/month
WASTEWATER FROM SCRUBBER		
Wastewater	291.7 kg/day	8,872.54 kg/month

EXECUTIVE SUMMARY

PROPOSED CONSTRUCTION FOR UNSATURATED POLYESTER RESINS AND ALKYD RESINS MANUFACTURING PLANT WITH ON-SITE THERMAL TREATMENT AT PLO 83, JALAN TERUNTUM 1, TANJUNG LANGSAT INDUSTRIAL COMPLEX, 81700 PASIR GUDANG, MUKIM SUNGAI TIRAM, DAERAH JOHOR BAHRU, JOHOR DARUL TAKZIM

THERMAL OXIDIZER PROCESS



Small Plant , 825 kg/h Design Duty

Stream No.		1	2	3	4	5	6	7
Description		Combustion Air	DELETED	Waste Water	Atomizer Air	Natural Gas	Flue Gas Combustor	DELETED
Temperature	°C	ambient		ambient	ambient	ambient	950	
Pressure	kPag	35 mbarg		4-6 barg	4-6 barg	0.2 - 4.0 barg	15 mbarg	
Flow	Nm^3/h	3100		825 kg/h	100-160 *	210	4,250	

Stream No.		8	9	10	11	12	13	14
Description		Flue Gas after Thermal Oil HEX	Thermal Oil before Air Cooler HEX	Thermal Oil after Air Cooler HEX	Thermal Oil before Thermal Oil HEX	Thermal Oil after Thermal Oil HEX	Amb Air before Air Cooler HEX	Amb Air after Air Cooler HEX
Temperature	°C	350	262	235	235	262	25	150
Pressure	kPag	0 to 5 mbarg	2-3 barg	1.5-2.5 barg	4.5-5.5 barg	3.5-4.5 barg	15 mbarg	0 to 5 mbarg
Flow	Nm^3/h	4,250	70 m3/h	70 m3/h	70 m3/h	70 m3/h	23,200	23,200

* not included in the total balance, the actual figure depends on the choice of the atomizing system

PROJECT ACTIVITIES

Pre-development

- Preliminary site investigation survey

During Development

- Site clearing
- Plant construction
- Construction of infrastructure and utilities

Post-development

- Plant operation
- Maintenance works
- Air pollution control system
- Scheduled waste management
- Closure / abandonment

EXECUTIVE SUMMARY

PROPOSED CONSTRUCTION FOR UNSATURATED POLYESTER RESINS AND ALKYD RESINS MANUFACTURING PLANT WITH ON-SITE THERMAL TREATMENT AT PLO 83, JALAN TERUNTUM 1, TANJUNG LANGSAT INDUSTRIAL COMPLEX, 81700 PASIR GUDANG, MUKIM SUNGAI TIRAM, DAERAH JOHOR BAHRU, JOHOR DARUL TAKZIM

EXISTING ENVIRONMENT

TOPOGRAPHY
- Relatively flat with elevations from 20m to 25m above MSL

HYDROLOGY
- No river within the project site
- Perimeter drain surrounding the project site. Drainage flow will discharge to Sg. Kim Kim, within 2km from the project site

NOISE AND VIBRATION LEVEL
- 5 sampling stations
- All sampling stations are complying with the standards

WATER QUALITY
- 7 sampling points were selected (No flow at WQ7)
- Class II: WQ1
- Class III: WQ2, WQ3, WQ5, WQ6
- Class IV: WQ4

AMBIENT AIR QUALITY
- 5 sampling stations
- All sampling points complied with the limits prescribed in the New Malaysia Ambient Air Quality Standard 2020.

GROUNDWATER QUALITY
- 1 sampling station.
- All sampling points complied with the recommended limits except for TSS

ODOUR DETERMINATION

Sampling Location	Dilution to Threshold (D/T)			*Range 1
	Afternoon	Night-time	Morning	
Plant Boundary				
O1: Project Site	0	0	0	0
Range 2	0	0	0	
Surrounding Areas				
O2: Taman Kota Masai	<2 *(Earthy smell)*	<2 *(Greenery smell)*	0	0 – <2
O3: Taman Pasir Putih	4 *(Combustion smell)*	<2 *(Grass smell)*	<2 *(Grass smell)*	<2 - 4
O4: Kg. Tanjung Langsat	<2 *(Combustion smell)*	<2 *(Vehicle combustion smell)*	<2 *(Rubbish smell)*	<2
*Range 2	<2 - 4	<2	0 – <2	

Note: 0 means not detected (no odour perceived) while <2 means very faint odour perceived (above odour threshold)
**Range 1 is sampling location based while Range 2 is sampling period based.*

LAND USE
- Project area is already under industrial zoning area inside the Tanjung Langsat Industrial Complex
- There are few residential area within 5km radius from project site such as Taman Kota Masai, Taman Pasir Puteh, Taman Tanjung Puteri Resort, Kampung Tanjung Langsat, Kampung Perigi Acheh, Taman Pasir Emas, Kampung Orang Asli Pasir Puteh and Kampung Orang Asli Kabong

PUBLIC HEALTH
- Concerning disease within study area: Eye and respiratory disease, cardiovascular disease, skin disease, dengue and malaria

TRAFFIC
- Traffic count was conducted at 4 different locations nearby project site.
- The results show that existing road within the vicinity of the proposed site is still operating below the road capacity and it still in good LOS. (Jalan Pekeliling, Jalan Rumbia 1, Jalan Rumbia 1/1 and SDE Expressway)

EXECUTIVE SUMMARY

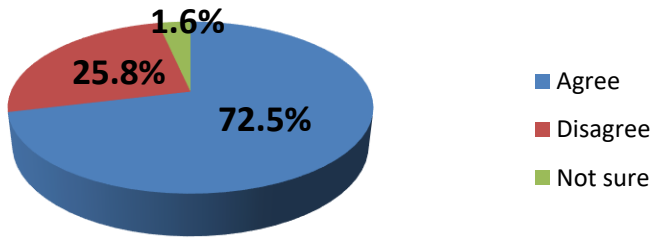
PROPOSED CONSTRUCTION FOR UNSATURATED POLYESTER RESINS AND ALKYD RESINS MANUFACTURING PLANT WITH ON-SITE THERMAL TREATMENT AT PLO 83, JALAN TERUNTUM 1, TANJUNG LANGSAT INDUSTRIAL COMPLEX, 81700 PASIR GUDANG, MUKIM SUNGAI TIRAM, DAERAH JOHOR BAHRU, JOHOR DARUL TAKZIM

EXISTING ENVIRONMENT

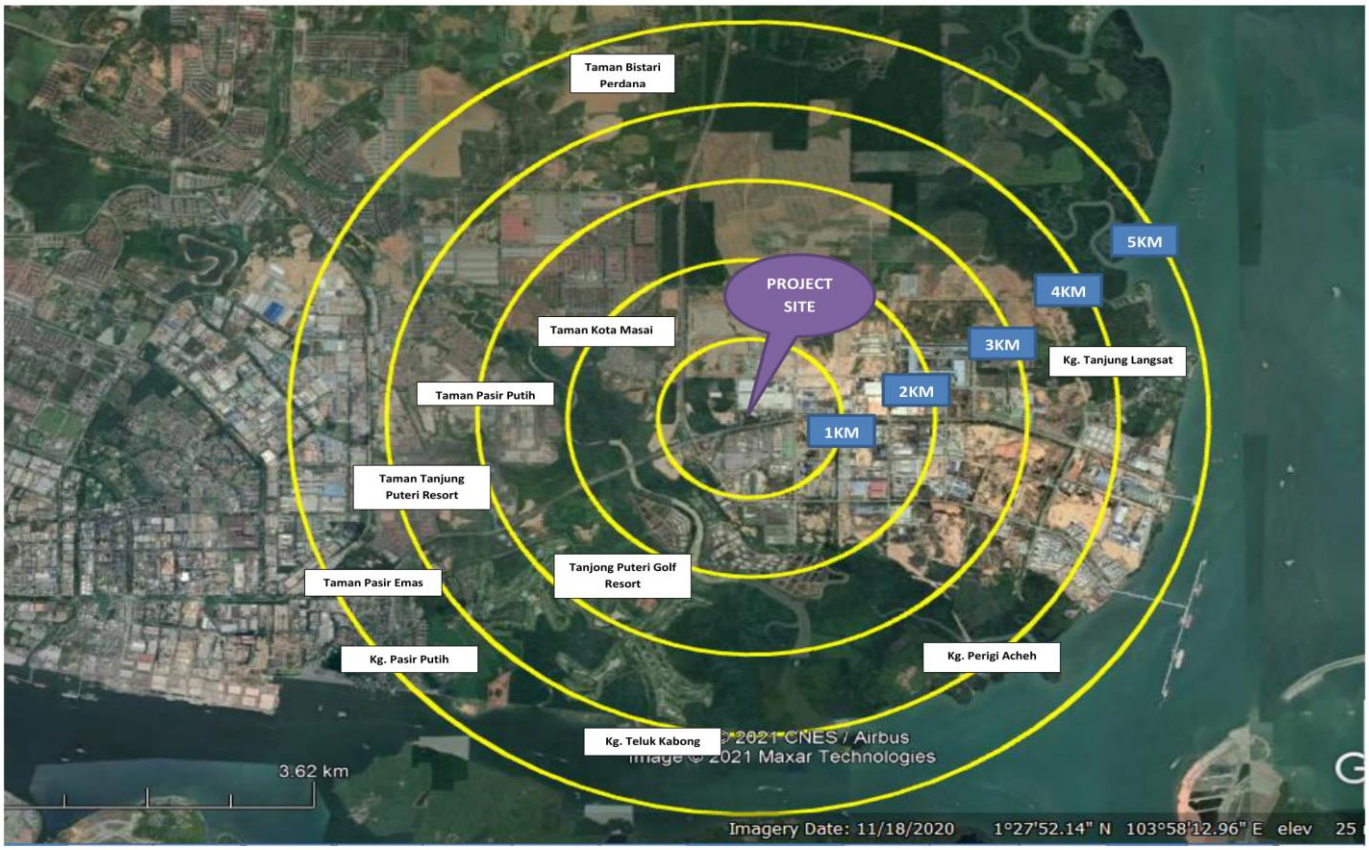
SOCIO – ECONOMY

- Total of respondents = 285
- Nearest settlement area: Taman Kota Masai, Taman Pasir Putih, Taman Tanjung Puteri Resort, Kampung Tanjung Langsat, Kampung Perigi Acheh, Taman Pasir Emas, Kampung Pasir Putih, Kampung Orang Asli Pasir Putih, Kampung Orang Asli Kabong
- Public engagements meeting conducted at Tanjung Puteri Golf Resorts

Level of Acceptability of the Project



5KM RADIUS SENSITIVE RECEPTOR



EXECUTIVE SUMMARY

PROPOSED CONSTRUCTION FOR UNSATURATED POLYESTER RESINS AND ALKYD RESINS MANUFACTURING PLANT WITH ON-SITE THERMAL TREATMENT AT PLO 83, JALAN TERUNTUM 1, TANJUNG LANGSAT INDUSTRIAL COMPLEX, 81700 PASIR GUDANG, MUKIM SUNGAI TIRAM, DAERAH JOHOR BAHRU, JOHOR DARUL TAKZIM

POTENTIAL IMPACT & MITIGATION MEASURES

POTENTIAL IMPACTS	MITIGATION MEASURES
AIR QUALITY Construction stage • Site clearing and earthworks will generate dust during dry periods when strong winds blow . • Dust generation through transportation activities inside the construction area • Dust generation from machinery operations at project site such as excavators, roller compactor, back pusher. Operation stage • Stack emission from thermal oxidizer, scrubber and thermal oil heater operation.	Construction stage • Installation of temporary hoarding • Provision of water browser, wash trough & portable water jet • Imposed the speed limit • Cover for stockpile • Prohibition of open burning • Vehicles and machineries maintenance Operation Stage • Installation of Air Pollution Control System (APCS) – Thermal Oxidizer and Scrubber • Installation of Continuous Emission Monitoring System (CEMS) • Conduct regular inspection, monitoring and maintenance of abatement equipment • Using of odour neutralizing sprays and additives • Periodic ambient air quality monitoring & odour sampling and determination

AIR QUALITY MODELLING FOR OPERATION PHASE

NORMAL SCENARIO	ABNORMAL SCENARIO
• The calculated GLCs for identified criteria air pollutants at the identified off-site ASRs i.e. ASR1, ASR2, ASR3, ASR4 and ASR5 met the Malaysian Ambient Air Quality Standards 2020 (MAAQS 2020) and the adopted Ontario's Ambient Air Quality Criteria. • Further assessment on the contribution based on 25% threshold of the adopted IFC standard indicates that the predicted MAICs for the MAAQS 2020 and OAAQC criteria pollutants were within the calculated thresholds.	• Predicted MAIC at all identified ASRs were below the adopted Acute Exposure Guideline Level-1 (Non-disabling) (AEGL-1) values for the available air pollutants (i.e Acetone and Propanol). • It is also anticipated that one may perceived residual smell/odour of the untreated VOCs.

EXECUTIVE SUMMARY

PROPOSED CONSTRUCTION FOR UNSATURATED POLYESTER RESINS AND ALKYD RESINS MANUFACTURING PLANT WITH ON-SITE THERMAL TREATMENT AT PLO 83, JALAN TERUNTUM 1, TANJUNG LANGSAT INDUSTRIAL COMPLEX, 81700 PASIR GUDANG, MUKIM SUNGAI TIRAM, DAERAH JOHOR BAHRU, JOHOR DARUL TAKZIM

POTENTIAL IMPACT & MITIGATION MEASURES

POTENTIAL IMPACTS	MITIGATION MEASURES
NOISE LEVEL & VIBRATION Construction stage • Noise and vibration generated during construction work (piling, materials transportation, earthwork). • Nuisance to nearby community. Operation stage • Plant and machineries operation • Raw materials and final product transportation	• Installation of temporary hoarding • Maintenance of equipment and machineries • Provision of Ear Protective Safety Equipment (ear plug & ear muff) • Construction activities limited to day time only • Environmental monitoring for noise & vibration
WATER QUALITY Construction Stage • Decrease water quality level. • Loose sediment being carried off site via surface runoff (sedimentation). • Sewage and accident spillage from skid tank and machineries. Operational stage • No effluent to be discharge during operation stage • Leakage or spillage of wastewater from abnormal operation or malfunction of thermal oxidizer	Construction stage • Installation of BMPs such as silt trap, silt fence crusher run, temporary earthdrain, etc. • Provide temporary and portable toilet. • Provide containment bund for skid tank. • Regular maintenance for machineries. Operation stage • Storage tank for wastewater will be provided if any abnormal operation or malfunction of thermal oxidizer happen
SOIL EROSION & SEDIMENTATION Construction Stage • Soil erosion and sedimentation will occur during site clearing and earthwork activities. • Reduce river depth/drain capacity.	• Scheduling of the development. • Installation of BMPs such as silt trap, silt fence, crusher run, temporary earthdrain, etc. • Retain buffer zone.
WASTE GENERATION • Biomass waste (Construction stage) • Domestic Waste (Construction & operation stage) • Construction waste (Construction stage) • Scheduled waste (Construction & operation stage)	• Prohibition of open burning • Provide designated area for temporary construction waste disposal / construction waste bin • Promoting the 3R concept (Reduce, Reuse & Recycle) • Providing the scheduled waste storage area / building • Disposed out the scheduled waste by licensed scheduled waste contractor
SOCIO-ECONOMY • Job opportunities • Influx of foreign workers • Business opportunities • Environmental nuisance and impact	• To hire local residents as a manpower either during construction or operation stage • Provide adequate utilities and facilities to the workers and health examination • Conducting environmental monitoring program • Implementation of CSR program

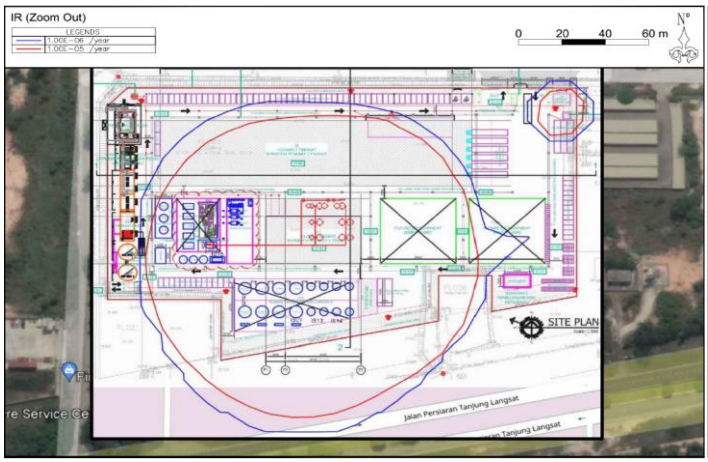
EXECUTIVE SUMMARY

PROPOSED CONSTRUCTION FOR UNSATURATED POLYESTER RESINS AND ALKYD RESINS MANUFACTURING PLANT WITH ON-SITE THERMAL TREATMENT AT PLO 83, JALAN TERUNTUM 1, TANJUNG LANGSAT INDUSTRIAL COMPLEX, 81700 PASIR GUDANG, MUKIM SUNGAI TIRAM, DAERAH JOHOR BAHRU, JOHOR DARUL TAKZIM

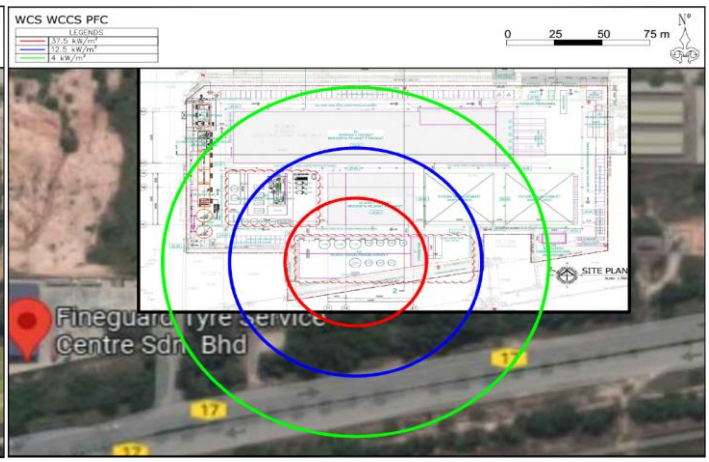
POTENTIAL IMPACT & MITIGATION MEASURES

POTENTIAL IMPACTS	MITIGATION MEASURES
TRAFFIC • Increase in the number of heavy vehicles during construction stage and transporting vehicles during operation stage for raw material and final product movement	• Regular maintenance of access road • Imposed speed limit • Provision of flagmen • Implementation of Traffic Management Plan (TMP)
RISK • Pool fire • Jet fire • Flash fire • Explosion	• Conduct fire and gas detection mapping • Prepare detail Emergency Response Plan (ERP) • To revised hazard identification and risk if any design changes happen during operation

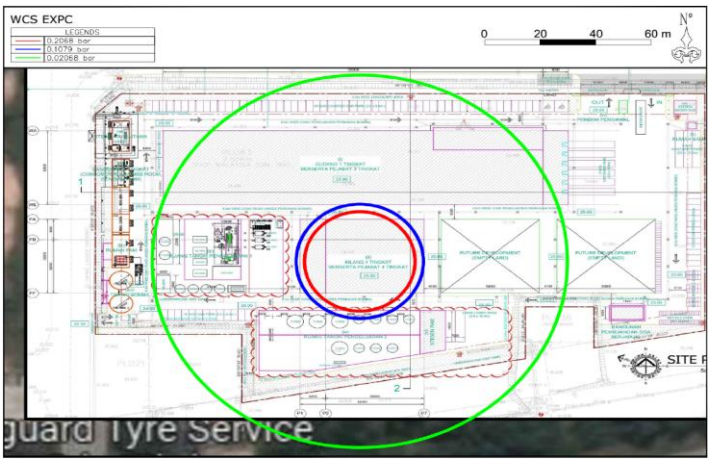
QUANTITATIVE RISK ASSESSMENT MODELLING



Individual Risk (IR) Contour



WCS and WCCS for Fire Event



WCS for Explosion Event

- IR Contours remain within the established industrial development. Comply with requirements stipulated by the DOE risk criteria.
- Worst case scenario (WCS) and Worst case credible scenario (WCCS) for pool fire event – heat radiation hazard zone is up to 101 meter radius.
- WCS for explosion event – hazard zone extend to 75 meter radius

EXECUTIVE SUMMARY

PROPOSED CONSTRUCTION FOR UNSATURATED POLYESTER RESINS AND ALKYD RESINS MANUFACTURING PLANT WITH ON-SITE THERMAL TREATMENT AT PLO 83, JALAN TERUNTUM 1, TANJUNG LANGSAT INDUSTRIAL COMPLEX, 81700 PASIR GUDANG, MUKIM SUNGAI TIRAM, DAERAH JOHOR BAHRU, JOHOR DARUL TAKZIM

POTENTIAL IMPACT & MITIGATION MEASURES

POTENTIAL IMPACTS	MITIGATION MEASURES
HEALTH • Inhalation of exposure air pollutants • Respiratory disease • Irritating and corrosive to any tissue	<u>Construction stage</u> • Provision of water browser, wash trough and water jet to minimize the fugitive dust dispersion • Conduct regular housekeeping at the site • Conduct regular fogging <u>Operation stage</u> • Plant shutdown if any worst case scenario happen towards health condition surrounding area • To prepare the Emergency Response Plan (ERP)

HEALTH RISK ASSESSMENT

NORMAL SCENARIO	ABNORMAL SCENARIO
• All the GLC at the ASRs will meet their respective guideline values under the Malaysian Ambient Air Quality Standards (MAAQS) 2013 (2020) or the Ontario Ambient Air Quality Criteria (OAAQC) 2020. • Further assessment on the contribution based on 25% threshold of the adopted IFC standard indicates that the predicted MAICs for the MAAQS 2020 and OAAQC criteria pollutants were within the calculated thresholds.	• The predicted GLC of acetone and propanol at the 5 ASRs were well below their AEGL-1 levels. • Chronic, non-carcinogenic health effects of HCl is unlikely to occur, even after a lifetime exposure to the air pollutant.

EXECUTIVE SUMMARY

PROPOSED CONSTRUCTION FOR UNSATURATED POLYESTER RESINS AND ALKYD RESINS MANUFACTURING PLANT WITH ON-SITE THERMAL TREATMENT AT PLO 83, JALAN TERUNTUM 1, TANJUNG LANGSAT INDUSTRIAL COMPLEX, 81700 PASIR GUDANG, MUKIM SUNGAI TIRAM, DAERAH JOHOR BAHRU, JOHOR DARUL TAKZIM

PERFORMANCE MONITORING (PM) – DURING CONSTRUCTION STAGE

P2M2 TOOLS	PARAMETERS	RECOMMENDED LIMITS	FREQUENCY
Sediment basin/trap	Silt marker	2/3 depth from sediment trap	Weekly or after rainfall event greater than 12.5mm (*in- situ*)
Silt fence	Sediment level		Biweekly or after rainfall event greater than 12.5mm *(in-situ*)
Earth drain with check dam	Sediment level		
Wash trough	Sediment level		
Scheduled waste storage area	-	Environmental Quality (Scheduled Wastes) Regulation 2005	Daily inventory when necessary

PERFORMANCE MONITORING (PM) – DURING OPERATION STAGE

P2M2 TOOLS	PARAMETERS	RECOMMENDED LIMITS	FREQUENCY
Scrubber	Pressure drop, temperature, liquid flow rate, pH, stack emission, air flow rate	Technical Guidance on Performance Monitoring of Air Pollution Control Systems, 2006, DOE A Guidebook on Performance Monitoring for Scrubber	Daily, weekly, monthly
Thermal Oxidizer	VOC concentration, Combustion temperature, CO concentration, exhaust	Technical Guidance on Performance Monitoring of Air Pollution Control Systems, 2006, DOE	Daily, weekly, monthly
Scheduled waste storage area	-	Environmental Quality (Scheduled Wastes) Regulation 2005	Daily inventory when necessary

COMPLIANCE MONITORING (CM) – DURING CONSTRUCTION STAGE

COMPONENTS	PARAMETERS	COMPLIANCE LIMITS	FREQUENCY
Ambient air quality	PM10, PM2.5, NO2, SO2, CO, O3	New Malaysian Ambient Air Quality Standard, 2020	Quarterly
Noise level	Laeq, Lmin, Lmax , L10, L90	Guidelines for Environmental Noise Limits and Control, 2019	Quarterly
Water quality	TSS, BOD, pH, Turbidity, COD, AN, Faecal coliform, O&G, Temperature, DO	National Water Quality Standard Class III	Monthly
Vibration	Peak Particle Velocity (PPV)	Guidelines for Environmental Vibration Limits and Control, 2021	Quarterly

EXECUTIVE SUMMARY

PROPOSED CONSTRUCTION FOR UNSATURATED POLYESTER RESINS AND ALKYD RESINS MANUFACTURING PLANT WITH ON-SITE THERMAL TREATMENT AT PLO 83, JALAN TERUNTUM 1, TANJUNG LANGSAT INDUSTRIAL COMPLEX, 81700 PASIR GUDANG, MUKIM SUNGAI TIRAM, DAERAH JOHOR BAHRU, JOHOR DARUL TAKZIM

COMPLIANCE MONITORING (CM) – DURING OPERATION STAGE

COMPONENTS	PARAMETERS	COMPLIANCE LIMITS	FREQUENCY
Stack emission monitoring – Thermal Oxidizer	PM, SO2, NO2, CO, HCl, HF, NMVOC	Environmental Quality (Clean Air) Regulations 2014, Third Schedule, Regulation 13	Monthly
Stack emission monitoring - Scrubber	NMVOC	Environmental Quality (Clean Air) Regulations 2014, Second Schedule, Regulation 13	Monthly
Stack emission monitoring – Thermal Oil Heater	Total PM, NO2, CO	Environmental Quality (Clean Air) Regulations 201X, Second Schedule, Regulation 13 (Draft Amendment)	Monthly
Ambient air quality	PM10, PM2.5, NO2, SO2, CO, O3	New Malaysian Ambient Air Quality Standard, 2020	Monthly
Noise level	Laeq, Lmin, Lmax, L10, L90	Guidelines for Environmental Noise Limits and Control, 2019	Quarterly

IMPACT MONITORING (IM) – DURING CONSTRUCTION STAGE

COMPONENTS	PARAMETERS	COMPLIANCE LIMITS	FREQUENCY
Ambient air quality	PM10, PM2.5, NO2, SO2, CO, O3	New Malaysian Ambient Air Quality Standard, 2020	Quarterly
	Odour	Refer baseline data for limit reference	Quarterly
Noise level	Laeq, Lmin, Lmax , L10, L90	Guidelines for Environmental Noise Limits and Control, 2019	Quarterly
Water quality	TSS, BOD, pH, Turbidity, COD, AN, Faecal coliform, O&G, Temperature, DO	National Water Quality Standard Class III	Monthly
Vibration	Peak Particle Velocity (PPV)	Guidelines for Environmental Vibration Limits and Control, 2021	Quarterly

IMPACT MONITORING (IM) – DURING OPERATION STAGE

COMPONENTS	PARAMETERS	COMPLIANCE LIMITS	FREQUENCY
Stack emission monitoring – Thermal Oxidizer	PM, SO2, NO2, CO, HCl, HF, NMVOC	Environmental Quality (Clean Air) Regulations 2014, Third Schedule, Regulation 13	Monthly
Stack emission monitoring - Scrubber	NMVOC	Environmental Quality (Clean Air) Regulations 2014, Second Schedule, Regulation 13	Monthly
Stack emission monitoring – Thermal Oil Heater	Total PM, NO2, CO	Environmental Quality (Clean Air) Regulations 201X, Second Schedule, Regulation 13 (Draft Amendment)	Monthly
Ambient air quality	PM10, PM2.5, NO2, SO2, CO, O3	New Malaysian Ambient Air Quality Standard, 2020	Monthly
Noise level	Laeq, Lmin, Lmax, L10, L90	Guidelines for Environmental Noise Limits and Control, 2019	Quarterly