

ENVIRONMENTAL IMPACT ASSESSMENT REPORT

**PROPOSED RUBBER TIRE WASTES AND RELATED
FEEDSTOCKS FOR REFINED OIL MANUFACTURING AT
PYROLYSIS FACILITY ON PART OF LOT 225111 (PLOT
A), JALAN GOPENG, KAWASAN PERINDUSTRIAN
TUNGZEN, MUKIM SUNGAI RAYA, 31300 KAMPUNG
KEPAYANG, PERAK DARUL RIDZUAN**



SUBMITTED BY:

P2 OIL SDN BHD

**LOT 225111, JALAN GOPENG, KAWASAN PERINDUSTRIAN
TUNGZEN, MUKIM SUNGAI RAYA, 31300 KAMPUNG KEPAYANG,
PERAK DARUL RIDZUAN**

MARCH 2024

DECLARATION BY PROJECT PROPONENT

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ENVIRONMENTAL IMPACT ASSESSMENT FOR

**PROPOSED RUBBER TIRE WASTES AND RELATED FEEDSTOCKS FOR
REFINED OIL MANUFACTURING AT PYROLYSIS FACILITY ON PART OF
LOT 225111 (PLOT A), JALAN GOPENG, KAWASAN PERINDUSTRIAN
TUNGZEN, MUKIM SUNGAI RAYA, 31300 KAMPUNG KEPAYANG,
PERAK DARUL RIDZUAN.**

BY

P2 OIL SDN BHD

I hereby declare the followings:

- (i) The entire EIA Report is the product of the Qualified Persons (i.e., the EIA Consultant) engaged by my company and all the facts stated in the Report and the accompanying information are to the best of my knowledge and belief to be true and correct, and that I have not withheld or distorted any material facts.
- (ii) I agree and I undertake the responsibility to implement all the pollution prevention and mitigation measures (P2M2) and *LD-P2M2 described in the EIA Report, in the Environmental Management Plan (EMP), as proposed by the EIA Consultants.
- (iii) I have allocated sufficient funds for the above purpose.

Name : TAN SHENG YAN

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Designation : DIRECTOR

Signature : 

Date : 21/2/2024

Company's Stamp : 

Note: *LD-P2M2 is referring to land-disturbing pollution prevention & mitigation measures

DECLARATION BY EIA STUDY TEAM LEADER



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DECLARATION BY EIA STUDY TEAM LEADER

ENVIRONMENTAL IMPACT ASSESSMENT

FOR

**PROPOSED RUBBER TIRE WASTES AND RELATED
FEEDSTOCKS FOR REFINED OIL MANUFACTURING AT
PYROLYSIS FACILITY ON PART OF LOT 225111 (PLOT A),
JALAN GOPENG, KAWASAN PERINDUSTRIAN TUNGZEN,
MUKIM SUNGAI RAYA, 31300 KAMPUNG KEPAYANG,
PERAK DARUL RIDZUAN**

BY

P2 OIL SDN BHD

I declare the followings:

- (i) The entire EIA Report is the product of my own work and the work of my team members (i.e., other consultants who are also Qualified Persons) who worked under my supervision and all the facts stated in the Report and the accompanying information are to the best of my knowledge and belief true and correct and that I have not withheld or distorted any material facts.
- (ii) I have briefed the Project Proponent on the content of the Report and highlighted to him all the pollution prevention and mitigation measures (P2M2) and *LD-P2M2 described in it, and in the Environmental Management Plan (EMP), and the Project Proponent has agreed to implement them (i.e., P2M2).

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Date : 21 February 2024

Company's stamp :



*Note: *LD-P2M2 is referring to land-disturbing pollution prevention & mitigation measures*

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ACRONYMS

ACRONYMS

AN	Ammoniacal Nitrogen
APCS	Air Pollution Control System
BAT	Best Available Techniques
BMPs	Best Management Practices
BOD	Biochemical Oxygen Demand
CCC	Certificate of Completion and Compliance
CM	Compliance Monitoring
COA	Certificate of Analysis
COD	Chemical Oxygen Demand
DO	Dissolved Oxygen
DOE	Department of Environment
DOSH	Department of Occupational Safety and Health
EA	Environmental Audit
EB	Environmental Budgeting
EC	Environmental Competence
ESCP	Erosion and Sediment Control Plan
EESIM	Environmental Essentials for Sitting of Industries in Malaysia
EFs	Environmental Facilities
EIA	Environmental Impact Assessment
EMC	Environmental Monitoring Committee
EMP	Environmental Management Plan
EMR	Environmental Monitoring Report
EMS	Environmental Management System
EMT	Environmental Mainstreaming Tools
EO	Environmental Officer
EP	Environmental Policy
EPMC	Environmental Performance Monitoring Committee
EPMD	Environmental Performance Monitoring Document
EQA	Environmental Quality Act 1974
ERC	Environmental Reporting and Communication
ERCMC	Environmental Regulatory Compliance Monitoring Committee
ERP	Emergency Response Plan
ERT	Emergency Response Team
ESA	Environmental Sensitive Area
ET	Environmental Transparency

FA	First Aider
GSR	Guided Self-Regulation
HDPE	High-density Polyethylene
HIRARC	Hazard Identification, Risk Assessment and Risk Control
IECS	Industrial Effluent Characteristics Study
IETS	Industrial Effluent Treatment System
IM	Impact Monitoring
KM	Kebenaran Merancang
LD-P2M2	Land Disturbing Pollution Prevention & Mitigation Measures
LDPE	Low-density Polyethylene
MAAQS	Malaysia Ambient Air Quality Standard
MC	Main Contractor
MDBG	Majlis Daerah Batu Gajah
MMD	Malaysian Meteorological Department
MT	Metric Tonne
ND	Not Detected
NPP-4	National Physical Plan 4
OSHA	Occupational Safety and Health Act 1994
P2M2	Pollution Prevention & Mitigation Measures
PDRM	Polis Diraja Malaysia
PE	Population Equivalent
PM	Performance Monitoring
PMR	Performance Monitoring Report
POME	Palm Oil Mill Effluent
POSB	P2 Oil Sdn Bhd
PP	Project Proponent
PPE	Personal Protective Equipment
PS	Polystyrene
QP	Qualified Person
RTDBG	Rancangan Tempatan Daerah Batu Gajah 2025
SHO	Safety & Health Officer
SKMM	Skim Akreditasi Makmal Malaysia
TM	Telekom Malaysia
TNB	Tenaga Nasional Berhad
TPM	Tonnes Per Month
TSS	Total Suspended Solids

VOC	Volatile Organic Compounds
WAC	Waste Acceptance Criteria
WQI	Water Quality Index
ZOI	Zone of Impact

RINGKASAN EKSEKUTIF

CADANGAN PEMBUATAN MINYAK DITAPIS DENGAN MENGGUNAKAN SISA TAYAR GETAH DAN STOK SUAPAN YANG BERKAITAN DI DALAM KEMUDAHAN PIROLISIS DI SEBAHAGIAN DARIPADA LOT 225111 (PLOT A), JALAN GOPENG, KAWASAN PERINDUSTRIAN TUNGZEN, MUKIM SUNGAI RAYA, 31300 KAMPUNG KEPAYANG, PERAK DARUL RIDZUAN

JADUAL PERTAMA PENILAIAN KESAN KEPADA ALAM SEKELILING (EIA)

RINGKASAN EKSEKUTIF

PENDAHULUAN

Ini adalah Laporan Penilaian Impak Alam Sekitar (EIA) yang disediakan untuk P2 Oil Sdn Bhd (POSB) untuk diserahkan kepada Jabatan Alam Sekitar (JAS) Perak untuk kelulusan. Projek EIA ini dengan ini disebut sebagai **“CADANGAN PEMBUATAN MINYAK DITAPIS DENGAN MENGGUNAKAN SISA TAYAR GETAH DAN STOK SUAPAN YANG BERKAITAN DI DALAM KEMUDAHAN PIROLISIS DI SEBAHAGIAN DARIPADA LOT 225111 (PLOT A), JALAN GOPENG, KAWASAN PERINDUSTRIAN TUNGZEN, MUKIM SUNGAI RAYA, 31300 KAMPUNG KEPAYANG, PERAK DARUL RIDZUAN”**. Selepas ini, ia akan dikenali sebagai 'Projek'.

PENGGERAK PROJEK DAN ORANG YANG BERKELAYAKAN



PENGGERAK PROJEK

P2 OIL SDN (POSB)

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PENGERAKA PROJEK DAN ORANG YANG BERKELAYAKAN



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3. Cheah Jin Xun
Sistem Kawalan Pencemaran Udara (APCS)
4. Freddy Lee
Pemetaan GIS

KEPERLUAN UNDANG-UNDANG

Projek ini adalah tertakluk kepada Perintah Kualiti Alam Sekeliling (Aktiviti yang Ditetapkan) (Penilaian Kesan kepada Alam Sekeliling) 2015:

- Jadual Pertama, Aktiviti 14(b) Sisa Pepejal (ii) Pembinaan loji pulih guna



PENYATAAN KEPERLUAN

- Kemudahan pirolisis akan memperkenalkan dimensi baru bagi sektor pembuatan minyak ditapis serta pengurusan sisa tayar getah.
- Kegiatan ekonomi yang terlibat secara langsung: pengumpulan, pengangkutan, dan pemulihan dari sisa serta penjualan produk yang dipulihkan. Perkhidmatan tidak langsung yang terlibat merangkumi perkhidmatan perundingan alam sekitar, penilaian impak, pengurusan dan pemantauan oleh profesional.
- Kegiatan dan faedah ekonomi ini berupaya dijana oleh Projek ini adalah hasil kesedaran and pengetahuan terhadap pemuliharaan alam sekeliling dan pengkalan sumber serta tanggungjawab semua penjana sisa dalam putaran ekonomi.
- Keperluan Projek ini adalah berasas daripada sudut pandangan alam sekeliling dan kemampuan di samping membawa kepada kebaikan ekonomi, peluang perniagaan dan pekerjaan.

SITE MAP

Project Centre
 $101^{\circ} 08' 56.5''$ E
 $4^{\circ} 30' 43.7''$ N

A
 $101^{\circ} 08' 54.6''$ E
 $04^{\circ} 30' 44.2''$ N

B
 $101^{\circ} 08' 55.7''$ E
 $04^{\circ} 30' 44.5''$ N

C
 $101^{\circ} 08' 56.1''$ E
 $4^{\circ} 30' 42.6''$ N

D
 $101^{\circ} 08' 54.9''$ E
 $04^{\circ} 30' 42.4''$ N

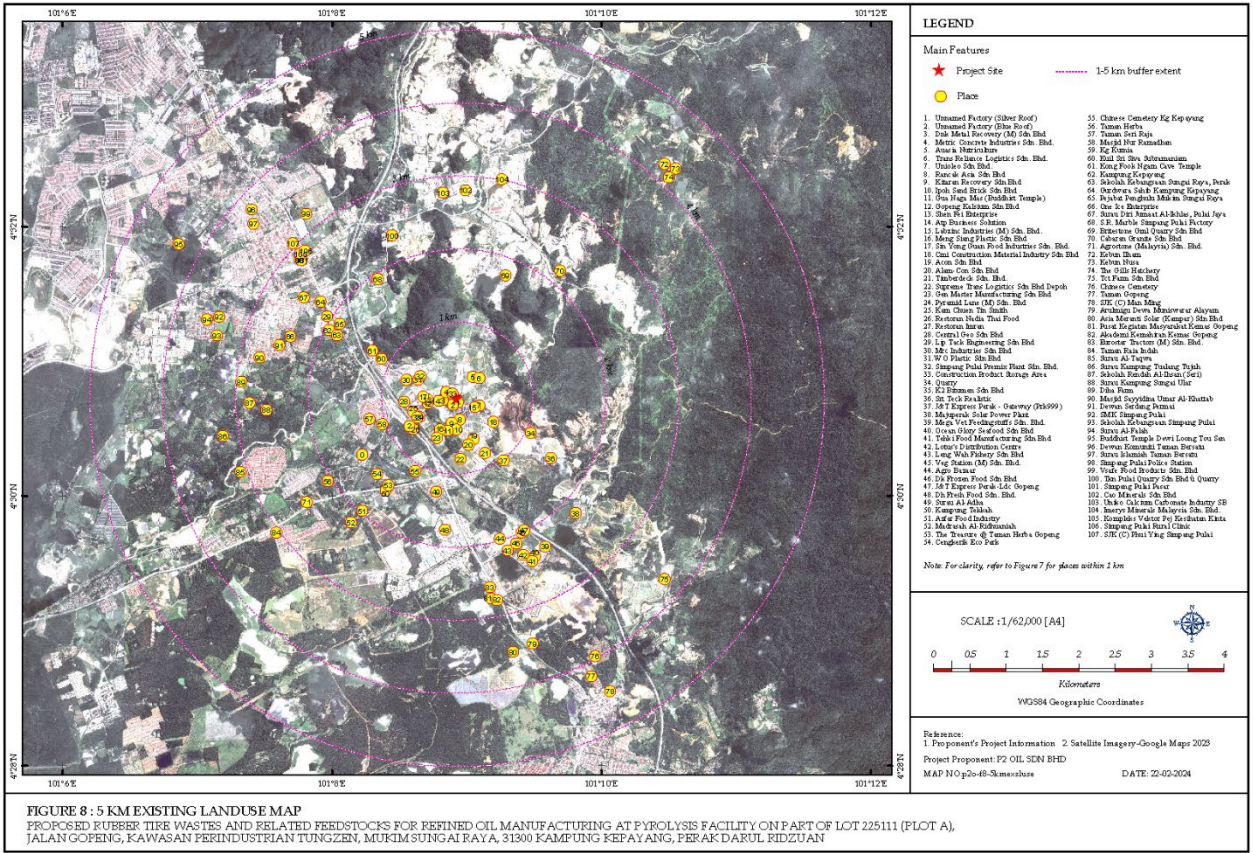
SCALE: 1/2,500

Source: Google Maps

LOKASI PROJEK



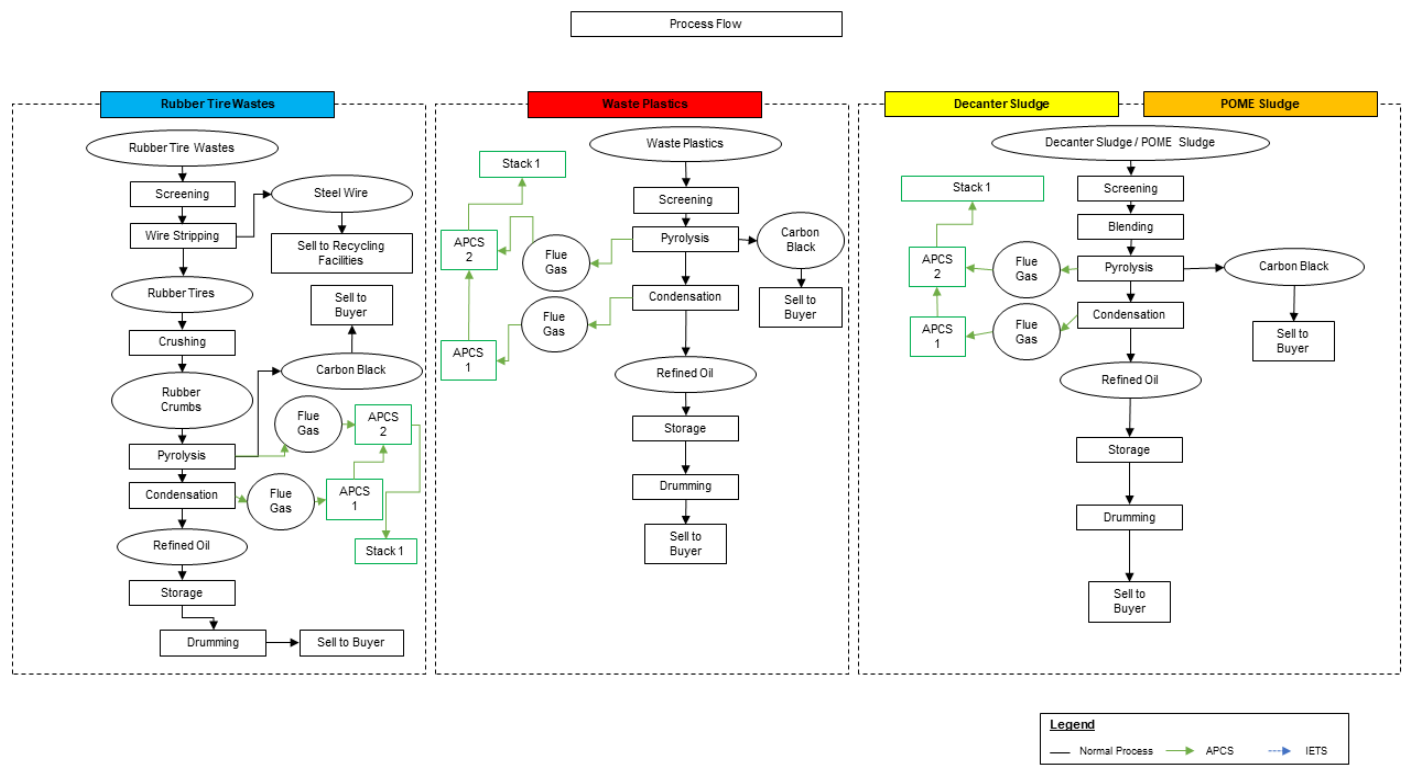
PETA GUNA TANAH – 5 KM



HURAIAN PROJEK

Penggerak Project (PP) bercadang untuk mengendalikan pembuatan minyak ditapis di kemudahan pirolisis bagi menghasilkan bahan-bahan yang berikut:

- (i) Minyak Ditapis (Refined Oil)
- (ii) Karbon Hitam
- (iii) Wayar Keluli





FASA OPERASI

- Pemasangan dan pengoperasian kesemua peralatan dan mesin
- Operasi pembuatan minyak ditapis di dalam kemudahan pirolisis
- Penyelenggaraan bangunan, kemudahan dan utiliti

PERSEKITARAN SEDIA ADA



GEOLOGI

Formasi *Quaternary*

Mendapan marin dan benua dengan tanah liat, kelodak, pasir dan gambut dengan kerikil kecil



TOPOGRAFI

Projek ini akan dilaksanakan di atas sebidang tanah rata (kawasan tanah pamah) di Kawasan Perindustrian Tungzen



TANAH

Siri tanah Lombong



IKLIM

Data Iklim kecuali *Wind Rose* (2010- 2021): Stesen Ipoh

Data Iklim untuk *Wind Rose* (2012-2021): Stesen Ipoh

Purata Hujan Tahunan: 2,843.1 mm

Purata suhu 24 jam: 26.6 °C to 28.1 °C

Purata 24-jam kelembapan relatif: 75.5% to 84.4%

Angin permukaan sering bertiup dari timur laut (33.2%), diikuti Selatan (14.7%), kemudian utara (14.2%) dan barat daya (10.8%).



GUNA TANAH

Dalam tapak Projek:

- Tapak Projek terletak di Kawasan Perindustrian Tungzen – sebuah kawasan perindustrian di Perak.
- Lot berdekatan tapak Projek ialah DNK Metal Recovery (M) Sdn Bhd dan Meranti Indah Sdn Bhd.

Dalam lingkungan 3-km Jejari dari Sempadan tapak Projek

- Penggunaan tanah dalam radius 1 km hingga 3 km dari sempadan tapak Projek terdiri daripada kawasan industri, kediaman, institusi, kemudahan sedia ada dan tempat-tempat ibadat.

PROGRAM PEMANTAUAN KESAN (IM)

Program pemantauan kesan alam sekitar (IM) adalah untuk mengenalpasti perubahan kepada alam sekitar yang diramalkan dan tidak dijangka disebabkan oleh cadangan Projek akan dijalankan seperti yang dinyatakan di bawah. Laporan Pemantauan Kualiti Alam Sekitar suku tahunan adalah disyorkan untuk dikemukakan kepada Jabatan Alam Sekitar berdasarkan data pemantauan yang diambil tiga bulan sekali, atau setiap tahun. Lokasi dan kekerapan pemantauan adalah ditunjukkan di dalam jadual di bawah.



STESEN PENSAMPELAN UNTUK KUALITI AIR

P2 OIL SDN. BHD.

Google Earth
Image © 2023 Maxar Technologies
Image © 2023 CNES

RIVER WATER QUALITY MONITORING – LAYOUT PLAN

Site Description: -

W1: Upstream (External Drain - Before Project site)

W2: Downstream (External Drain - After Project site)

W3: Downstream (Stormwater Drainage)

W4: Downstream (Stormwater Drainage)

W5: Downstream (Sungai Raya)

Prepared by:

KESPRO CONSULTANTS SDN. BHD.

Prepared for:

P2 OIL SDN BHD

Lokasi	Deskripsi	Koordinat	
		Latitud	Longitud
W1	Upstream (External Drain Before Project Site)	4°30'45.0"N	101°8'57.2"E
W2	Downstream (External Drain After Project Site)	4°30'44.3"N	101°8'54.3" E
W3	Downstream (Stormwater Drainage)	4°30'42.5"N	101°8'42.5"E
W4	Downstream (Stormwater Drainage)	4°31'01.0"N	101°8'17.4"E
W5	Downstream (Sungai Raya)	4°31'00.5"N	101°8'16.5"E



PROGRAM PEMANTAUAN KESAN (IM)

STESEN PENSAMPELAN UNTUK KUALITI UDARA

P2 OIL SDN. BHD.



AMBIENT AIR QUALITY MONITORING – PLAN LAYOUT

Site Description: -

A1: Project Boundary
A2: Nearest Shophouse at Taman Seri Raia
A3: Nearest House at Kg Tekkah
A4: Entrance at Auasia Nutriculture (Agro Based Industry)

Prepared by:
KESPRO CONSULTANTS SDN. BHD.

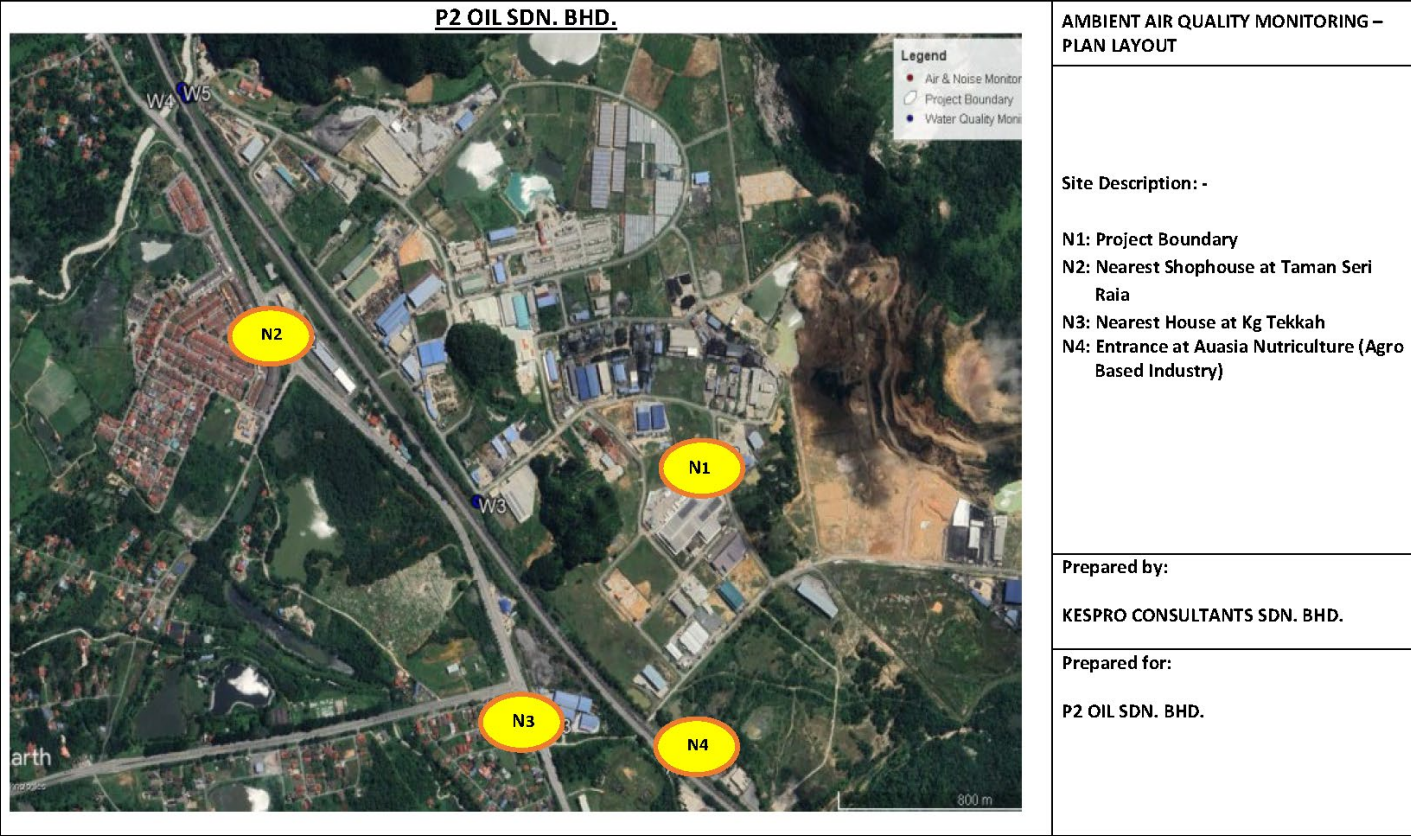
Prepared for:
P2 OIL SDN. BHD.

Lokasi	Deskripsi	Coordinat	
		Latitud	Longitud
A1	Project Boundary	4°30'44.4"N	101°08'54.6"E
A2	Nearest Shophouse at Taman Seri Raia	4°30'38.6"N	101°08'24.7"E
A3	Nearest House at Kg. Tekkah	4°30'05.6"N	101°08'48.6"E
A4	Entrance at Auasia Nutriculture (Agro-based Industry)	4°30'53.3"N	101°09'04.0"E

PROGRAM PEMANTAUAN KESAN (IM)



STESEN PERSAMPELAN UNTUK KUALITI BUNYI



Lokasi	Deskripsi	Coordinat	
		Latitud	Longitud
N1	Project Boundary	4°30'44.4"N	101°08'54.6"E
N2	Nearest Shophouse at Taman Seri Raia	4°30'38.6"N	101°08'24.7"E
N3	Nearest House at Kg Tekkah	4°30'05.6"N	101°08'48.6"E
N4	Entrance at Auasia Nutriculture (Agro Based Industry)	4°30'53.3"N	101°09'04.0"E

PENILAIAN IMPAK DAN LANGKAH-LANGKAH MITIGASI

Impak	Punca Impak	Tahap Impak	P2M2 Disyorkan	Rujukan dalam Laporan EIA
Fasa Operasi				
1.Pencemaran air/tanah akibat pengendalian	Tumpahan dan pelepasan tidak sengaja	Boleh Signifikan	- Penyimpanan dan pengendalian buangan terjadual yang selamat - Gunakan beg jumbo dan palet untuk pembendungan. - Simpan semua bahan mentah dengan mematuhi garis panduan amalan baik. - Semak bahan mentah yang masuk untuk memastikan penerimaan berdasarkan kriteria penerimaan sisa.	Seksyen 8.2.1
2.Pencemaran air/tanah akibat pengangkutan	Tumpahan atau pembuangan secara tidak sengaja bahan mentah dan bahan siap semasa pengangkutan	Boleh Signifikan	<u>Pengangkutan Buangan Terjadual</u> - Sediakan pelan logistik dan laluan. - Semua kenderaan hendaklah dilengkapi dengan kemudahan pembersihan - Periksa keadaan trak sebelum digunakan. <u>Tumpahan atau Pelepasan Secara Tidak Sengaja</u> - Gunakan peralatan perlindungan kakitangan (PPE) yang sesuai untuk memberi perlindungan kepada pekerja dalam mengendalikan sebarang tumpahan yang tidak disengajakan - Kontraktor/PP hendaklah membendung, membersihkan dan mengurangkan sebarang tumpahan atau pembuangan sisa yang tidak disengajakan secepat mungkin. - Laluan pengangkutan untuk mengelakkan kawasan berpenduduk padat, kawasan tadahan air dan kawasan sensitif alam sekitar yang lain.	Seksyen 8.2.2

PENILAIAN IMPAK DAN LANGKAH-LANGKAH MITIGASI

Impak	Punca Impak	Tahap Impak	P2M2 Disyorkan	Rujukan dalam Laporan EIA
3. Bahaya kebakaran di loji	Pencucuhan bahan api secara tidak sengaja	Boleh Signifikan	- Mempunyai ERP yang telah dilatih dengan baik yang boleh dilaksanakan dalam masa yang singkat. - Sistem pemadam kebakaran dengan siren akan dipasang. - Sistem yang perlu diperiksa dan diselenggara secara berkala. - Dilarang merokok dan larangan mancis, pemetik api dan alat penyalaaan lain di Loji. - Anggota bomba, apabila perlu, memakai peralatan perlindungan yang betul dan alat pernafasan serba lengkap. - Untuk menghubungi balai bomba apabila diperlukan. - Semua bilik tertutup hendaklah dipasang dengan pintu berkadar api sekurang-kurangnya satu jam. - Alat pemadam api perlu diletakkan di pelbagai lokasi strategik untuk memudahkan akses.	Seksyen 8.2.6
4. Buangan terjadual/ sisa-sisa/ enap cemar	Bahan ditolak daripada proses pembuatan minyak ditapis	Boleh Signifikan	- Buangan terjadual yang dihasilkan daripada operasi kitar semula hendaklah disimpan dalam tempat yang sesuai, dilabel dan kemudian dilupuskan di Kualiti Alam (KA) - Buangan yang terhasil daripada proses pemulihan sisa hendaklah disimpan dalam bekas yang sesuai dan kemudian dilupuskan di tapak pelupusan sampah yang diluluskan untuk sisa tidak berjadual. - Enapcemar sistem penapisan air (SW204) hendaklah disimpan dalam bekas yang sesuai dan kemudian dibuang di KA. - Kawasan penyimpanan mesti berbumbung untuk mengelakkan kemasukan air hujan dan mesti mempunyai pengudaraan yang mencukupi. .	Seksyen 8.2.8
5. Sisa pepejal	Sisa domestik	Tidak Signifikan	Sisa domestik akan diuruskan oleh pihak berkuasa tempatan dan dilupuskan di tapak pelupusan sampah yang ditetapkan	Seksyen 8.2.8

PENILAIAN IMPAK DAN LANGKAH-LANGKAH MITIGASI

Impak	Punca Impak	Tahap Impak	P2M2 Disyorkan	Rujukan dalam Laporan EIA
6. Pencemaran bunyi	• Disebabkan oleh kenderaan pengangkutan semasa operasi • Operasi reaktor pirolisis, pam dan kipas ekzos	Boleh Signifikan	• Pastikan semua peralatan operasi mempunyai sistem ekzos yang berfungsi baik. • Kipas ekzos hendaklah berfungsi dengan baik sepanjang operasi proses, dengan servis dan penyelenggaraan yang kerap.	Seksyen 8.2.4
7. Pencemaran udara	• Pembebasan zarah terampai daripada sistem kawalan pencemaran udara (APCS)	Boleh Signifikan	• Habuk fugitif boleh dikawal dengan membasahkan skrap (bahan bersaiz besar) jika perlu • Penyelenggaraan semua peralatan kawalan pencemaran udara di loji • Pemantauan prestasi pelepasan pencemaran udara dengan menjalankan pemantauan berkala,	Seksyen 8.2.3

PENILAIAN IMPAK DAN LANGKAH-LANGKAH MITIGASI

Impak	Punca Impak	Tahap Impak	P2M2 Di syorkan	Rujukan dalam Laporan EIA
8.Bahaya kesiha tan dan kesela matan	Semasa Operasi	Tidak Signifikan	- Untuk menerima pakai prosedur keselamatan industri yang diberikan dalam Peraturan OSHA 1994. - Helaian Data Keselamatan hendaklah disimpan di tapak untuk pemeriksaan. - Prosedur kecemasan, pelan tindakan dan latihan tetap akan dilaksanakan. - Dilarang merokok di dalam Loji. - Pekerja hendaklah memakai sarung tangan pelindung, cermin mata keselamatan dan pakaian pelindung lain apabila diperlukan. - Latihan kepada pekerja tertentu perlu disediakan seperti kursus memberikan pertolongan cemas. Peti pertolongan cemas perlu disediakan degan mudah diakses. - Latihan intensif mengenai prosedur keselamatan perlu disediakan untuk semua kakitangan.	Seksyen 8.2.10
9.Socio-Ekono mi	Pekerjaan; Estetika Persekitaran;Kebajikan Awam	Tidak Signifikan	- Kesempatan pekerjaan akan diberi keutamaan kepada orang tempatan dalam proses pengambilan. - Landskap dan penanaman semula dengan tumbuhan dan pokok renek yang sesuai. - Pekerja asing perlu diperiksa status kesihatannya bagi mengelakkan kemungkinan penularan wabak dalam kalangan pekerja.	Seksyen 8.2.10

EXECUTIVE SUMMARY

PROPOSED RUBBER TIRE WASTES AND RELATED FEEDSTOCKS FOR REFINED OIL MANUFACTURING AT PYROLYSIS FACILITY ON PART OF LOT 225111 (PLOT A), JALAN GOPENG, KAWASAN PERINDUSTRIAN TUNGZEN, MUKIM SUNGAI RAYA, 31300 KAMPUNG KEPAYANG, PERAK DARUL RIDZUAN

FIRST SCHEDULE ENVIRONMENTAL IMPACT ASSESSMENT (EIA)

EXECUTIVE SUMMARY

INTRODUCTION

This is an Environmental Impact Assessment (EIA) report prepared for P2 Oil Sdn Bhd (POSB), to be submitted to the Department of Environment (DOE) Perak for approval. This EIA Project is herewith referred to as the “**PROPOSED RUBBER TIRE WASTES AND RELATED FEEDSTOCKS FOR REFINED OIL MANUFACTURING AT PYROLYSIS FACILITY ON PART OF LOT 225111 (PLOT A), JALAN GOPENG, KAWASAN PERINDUSTRIAN TUNGZEN, MUKIM SUNGAI RAYA, 31300 KAMPUNG KEPAYANG, PERAK DARUL RIDZUAN.**”. Hereafter, it will be known as the Project.

PROJECT PROPONENT AND QUALIFIED PERSON



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Telephone No :	019 - 820 1820
Email :	chongsi@hotmail.com

PROJECT PROPONENT AND QUALIFIED PERSON



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3. Cheah Jin Xun

Air Pollution Control System

4. Freddy Lee

GIS Mapping

LEGISLATIVE REQUIREMENTS

This Project which falls under First Schedule, Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order, 2015:

- First Schedule, Activity 14(b) Solid Waste (ii) Construction of recovery plant or recycling plant



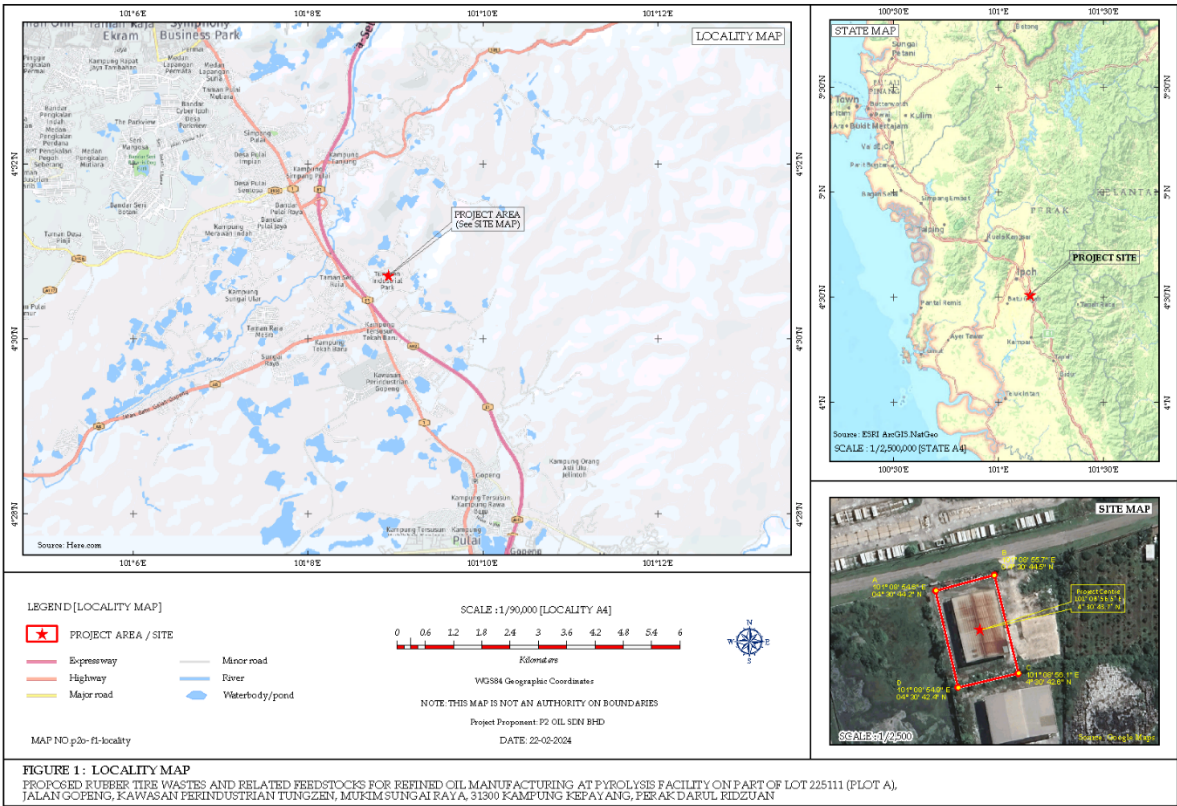
STATEMENT OF NEED

- The pyrolysis facility will introduce a new dimension to the economics of the refined oil manufacturing sector.
- Rubber tire wastes can be managed in an environmental friendly manner while curbing illegal dumping and spread of infectious diseases such as dengue fever.
- The economic activities directly created include collection and transportation of raw materials and sales of manufactured products. Indirect services created include environmental consultancy, impact assessment, management and monitoring services by professionals.
- These economic activities and benefits are derived from environmental awareness, consciousness in conservation of resources and responsibility of all waste generators in circular economy.
- The need for this Project is therefore justified from environmental and sustainability point of view besides offering economic benefits, business and job opportunities.

PROJECT LOCATION



LOCALITY MAP



SITE MAP



Figure 8: 5 km Existing Landuse Map

PROPOSED RUBBER TIRE WASTES AND RELATED FEEDSTOCKS FOR REFINED OIL MANUFACTURING AT PYROLYSIS FACILITY ON PART OF LOT 225111 (PLOT A), JALAN GOPENG, KAWASAN PERINDUSTRIAN TUNGENZ, MUKIM SUNGAI RAYA, 31300 KAMPUNG KEPAYANG, PERAK DARUL RIDZUAN

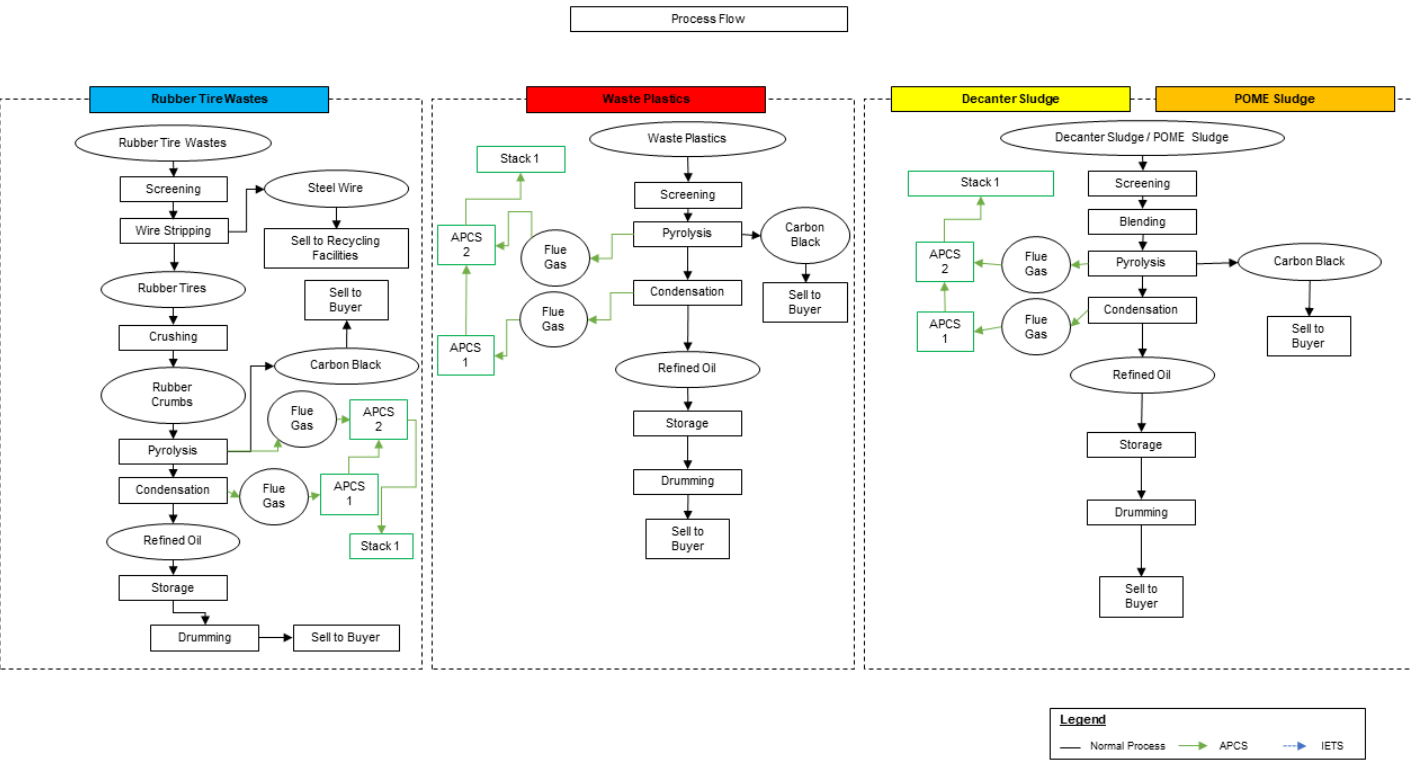
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ES-4

PROJECT DESCRIPTION

The Project Proponent (PP) intends to operate a refined oil manufacturing activity at a pyrolysis facility to produce the following goods:

- (i) Refined Oil (Pyrolysis Oil)
- (ii) Carbon Black
- (iii) Steel Wires





OPERATION PHASE

- Installation and commissioning of equipment and machineries
- Operation of refined oil manufacturing at pyrolysis facility
- Maintenance of building, facilities and utilities

EXISTING ENVIRONMENT



GEOLOGY

Quaternary Formation

Marine and continental deposits with clay, silt, sand and peat with minor gravel



TOPOGRAPHY

This Project will be sited on a piece of flat land area (lowland area) within Kawasan Perindustrian Tungze



SOIL

Lombong (Mined Land) soil series



CLIMATE

Climate Data except Wind Rose (2010- 2021): Ipoh Station

Climate Data for Wind Rose (2012-2021): Ipoh Station

Average Annual Rainfall: 2,843.1 mm

24-hr mean temperature: 26.6 °C to 28.1 °C

24-hr mean relative humidity: 75.5% to 84.4%

Surface winds often blow from northeast (33.2%), followed by south (14.7%) and then north (14.2%) and southwest (10.8%).



LAND USE

Within the Project site:

- The Project site is located within Kawasan Perindustrian Tungzen – an industrial area in Perak.
- The immediate neighboring lots of the Project site are DNK Metal Recovery (M) Sdn Bhd and Meranti Indah Sdn Bhd.

Within 3-km Radius from the Boundary of the Project site:

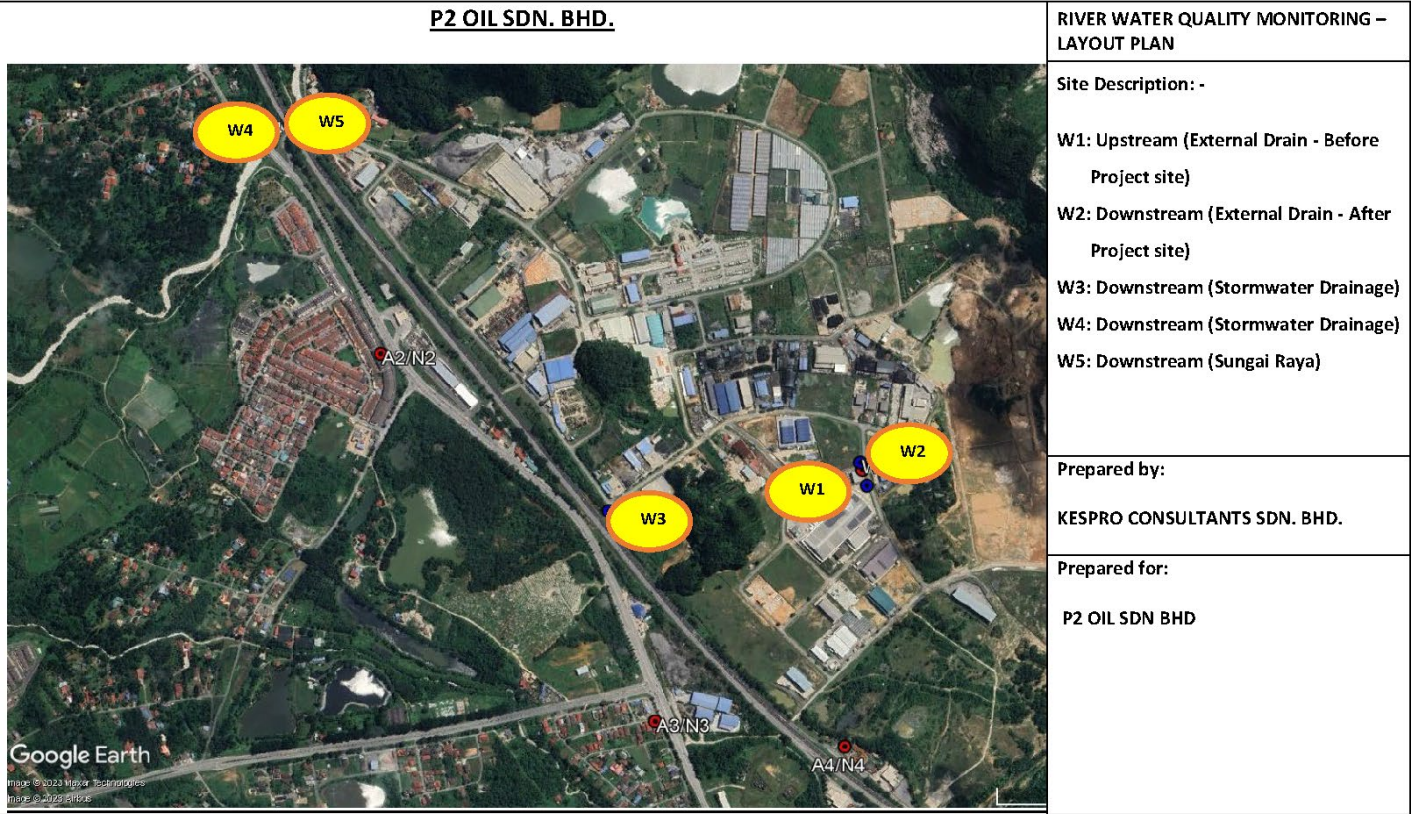
- Land use within 1 km to 3 km radius from the boundary of the Project site area made up of industry, residential areas, institutions, amenities and places of worship.

IMPACT MONITORING (IM) PROGRAM

An environmental impact monitoring (IM) program to identify the predicted and unanticipated changes to the environment brought about by the proposed Project will be carried out as stated below. A quarterly Environmental Quality Monitoring Report is recommended for submission to DOE based upon monitoring data collected monthly, quarterly or annually. The locations and frequencies of monitoring are shown in the table below.



SAMPLING LOCATIONS FOR WATER MONITORING

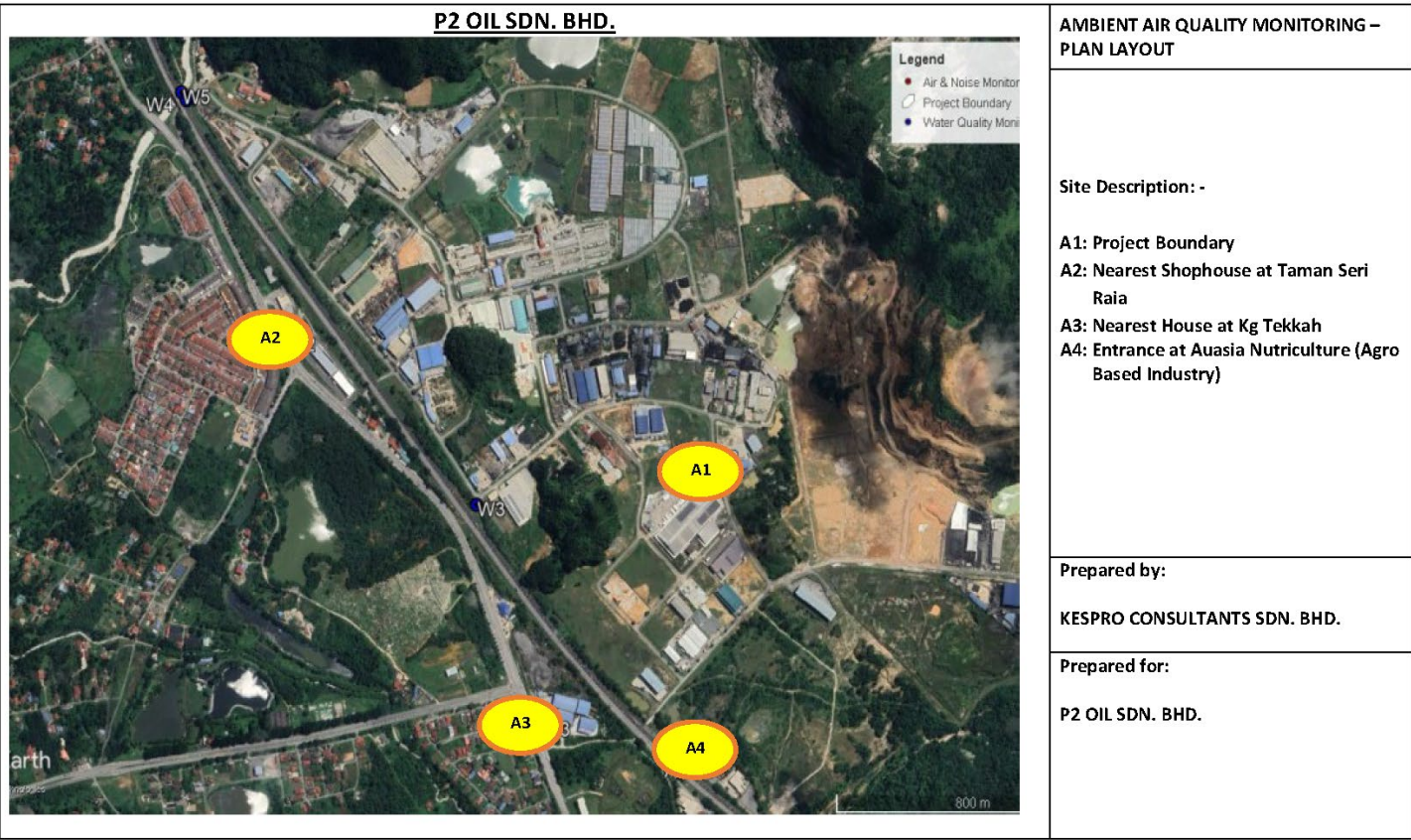


Location	Description	Coordinate	
		Latitude	Longitude
W1	Upstream (External Drain Before Project Site)	4°30'45.0"N	101°8'57.2"E
W2	Downstream (External Drain After Project Site)	4°30'44.3"N	101°8'54.3" E
W3	Downstream (Stormwater Drainage)	4°30'42.5"N	101°8'42.5"E
W4	Downstream (Stormwater Drainage)	4°31'01.0"N	101°8'17.4"E
W5	Downstream (Sungai Raya)	4°31'00.5"N	101°8'16.5"E



IMPACT MONITORING (IM) PROGRAM

SAMPLING LOCATION FOR AIR QUALITY

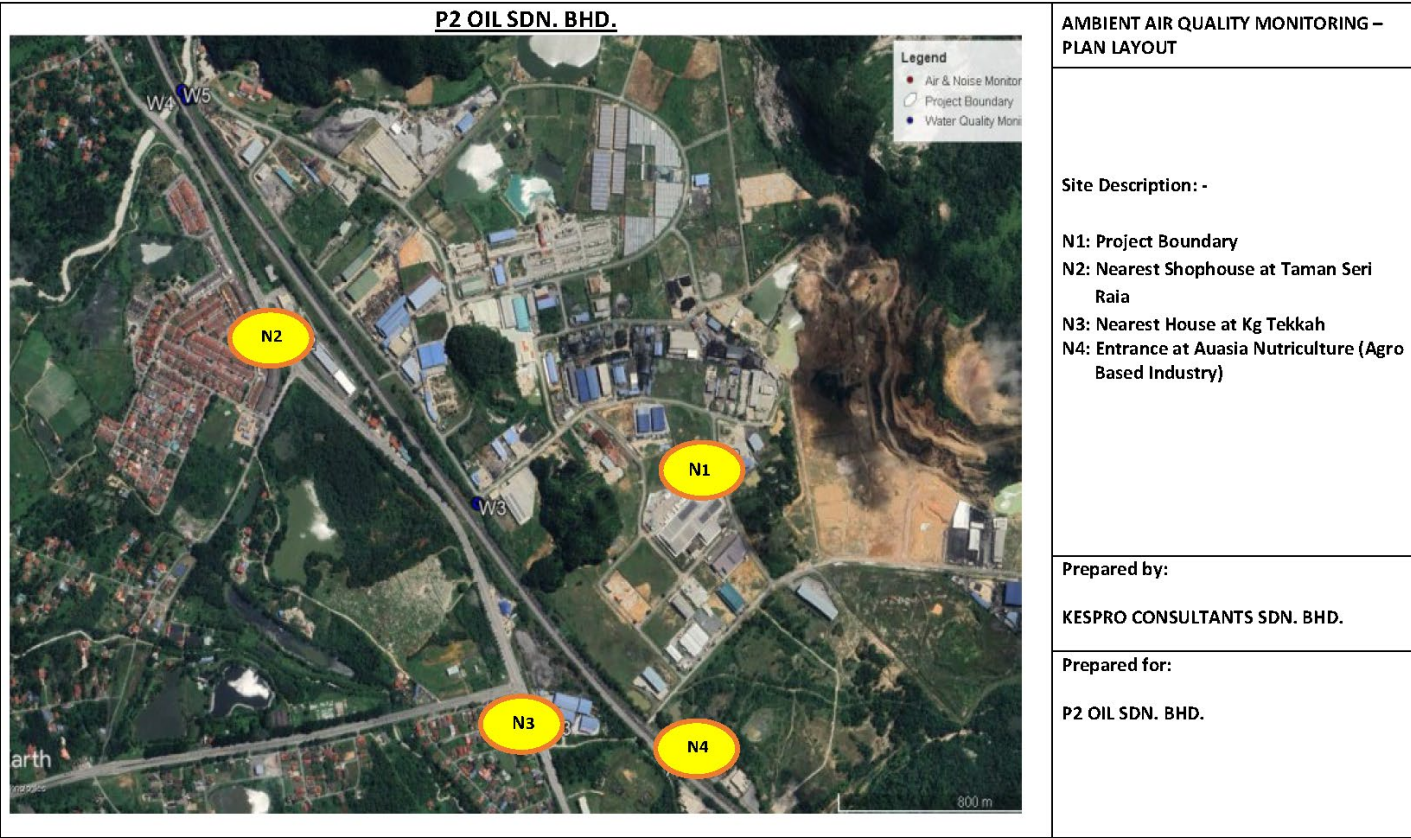


Location	Description	Coordinate	
		Latitude	Longitude
A1	Project Boundary	4°30'44.4"N	101°08'54.6"E
A2	Nearest Shophouse at Taman Seri Raia	4°30'38.6"N	101°08'24.7"E
A3	Nearest House at Kg. Tekkah	4°30'05.6"N	101°08'48.6"E
A4	Entrance at Auasia Nutriculture (Agro-based Industry)	4°30'53.3"N	101°09'04.0"E

IMPACT MONITORING (IM) PROGRAM



SAMPLING LOCATION FOR NOISE QUALITY



Location	Description	Coordinate	
		Latitude	Longitude
N1	Project Boundary	4°30'44.4"N	101°08'54.6"E
N2	Nearest Shophouse at Taman Seri Raia	4°30'38.6"N	101°08'24.7"E
N3	Nearest House at Kg Tekkah	4°30'05.6"N	101°08'48.6"E
N4	Entrance at Auasia Nutriculture (Agro Based Industry)	4°30'53.3"N	101°09'04.0"E

IMPACT ASSESSMENT AND MITIGATION MEASURES

Impact	Sources of Impact	Degree of Impact	Proposed P2M2	Reference in EIA Report
Operation Phase				
1. Water/Soil pollution due to handling	Spillage and accidental discharge	Can be significant	• Safe Storage and handling of scheduled wastes • Use durable drums, boxes or jumbo bags for containment. • Store all raw materials in compliance with good practice guidelines. • Check incoming feedstock to ensure acceptance based on waste acceptance criteria.	Section 8.2.1
2. Water/ Soil pollution due to transportation	Spillage or accidental discharge of raw materials and finished goods during transportation	Insignificant	<u>Transport of Scheduled Wastes</u> • Prepare a logistic and routing plan. • All vehicles to be equipped with cleaning up facilities • Check condition of the trucks before use. <u>Accidental Spillage or Discharge</u> • Use appropriate personnel protective equipment (PPE) to provide protection for workers in handling any accidental spillage. • The contractor/PP to contain, clean and abate any accidental spillage or discharge of the waste as soon as possible. • Transport route to avoid densely populated areas, water catchment areas and other environmentally sensitive areas.	Section 8.2.2

IMPACT ASSESSMENT AND MITIGATION MEASURES

Impact	Sources of Impact	Degree of Impact	Proposed P2M2	Reference in EIA Report
3. Fire hazard in the plant	Accidental ignition of fuel used for pyrolysis reactor	Can Be significant	• Have a well-rehearsed ERP that can be put into effect at short notice. • A central automatic fire-fighting system with sirens to be installed. • The system to be regularly inspected and maintained. • No smoking and prohibition of matches, lighters and other ignition devices in the Plant. • To call the fire stations when needed firefighters, when required, to wear proper protective equipment and self-contained breathing apparatus. • All enclosed rooms should be fitted with fire rated doors of at least one hour. • Fire extinguishers should be placed at various strategic locations for easy access.	Section 8.2.6
4. Scheduled waste/ residual waste	Rejects from refined oil manufacturing process	Can be Significant	• Scheduled wastes (particularly furnace slag/ash SW104) generated from the recycling operation shall be stored in suitable contained, labelled and then disposed at Kualiti Alam (KA) • Rejects/Residues from waste recycling process shall be stored in suitable container and then disposed at approved landfill for non-scheduled wastes • Sludge (SW204) shall be stored in suitable container and then disposed at Kualiti Alam (KA) • The storage area must be roofed to prevent entry of rainwater and must be ventilated adequately.	Section 8.2.8

IMPACT ASSESSMENT AND MITIGATION MEASURES

Impact	Sources of Impact	Degree of Impact	Proposed P2M2	Reference in EIA Report
5. Solid waste	Domestic waste	Insignificant	Domestic waste will be collected and disposed at the approved landfill site by Local Authority.	Section 8.2.8
6. Noise pollution	Caused by transport vehicles during the operation Reactor, pumps and exhaust fan operations	Can be significant	- Ensure that all operation equipment has functional exhaust systems. - Exhaust fan shall function adequately throughout the pyrolysis process operation, with regular service and maintenance.	Section 8.2.4
7. Air pollution	Emission of hazardous gases and particulate matters from chimney (APCS)	Can be significant	- Maintenance of all air pollution control equipment in the Plant - Performance monitoring of the air pollution emissions by conducting periodic monitoring, as well as CEMS (continuous emission monitoring system) for important parameters	Section 8.2.3
8. Health and safety hazards	During operation	Insignificant	- To adopt industrial safety procedures given in the OSHA Regulation 1994. - Safety Data Sheets to be kept on site for inspection. - Emergency procedures, action plans and regular drills to be executed. - No smoking allowed within the Plant. - Workers, when necessary, to wear protective gloves, safety goggles and other protective clothing. - Train certain workers to provide first aid and have available easily accessible first aid kits. - Intensive training on safety procedures should be provided for all personnel.	Section 8.2.10

IMPACT ASSESSMENT AND MITIGATION MEASURES

Impact	Sources of Impact	Degree of Impact	Proposed P2M2	Reference in EIA Report
9.Socio-Economy	Employment; Environmental Aesthetics; Public Welfare	Insignificant	• Local to given priority in recruitment process • Landscaping and replanting with suitable plants and shrubs • Foreign workers need to be checked for health status to avoid possible spread of epidemics among workers	Section 8.2.10

CHAPTER 1

INTRODUCTION

CHAPTER 1 : INTRODUCTION

1.1 TITLE OF PROJECT

1.1.1 Name of Project

This is an Environmental Impact Assessment (EIA) Report prepared for **P2 Oil Sdn Bhd (POSB)**, to be submitted to the Department of Environment (DOE) Perak for approval of solid wastes recovery activities at a pyrolysis facility on part of Lot 225111 (Plot A), Jalan Gopeng, Kawasan Perindustrian Tungzen, Mukim Sungai Raya, 31300 Kampung Kepayang, Perak Darul Ridzuan.

This EIA Project is herewith referred to as the **“PROPOSED RUBBER TIRE WASTES AND RELATED FEEDSTOCKS FOR REFINED OIL MANUFACTURING AT PYROLYSIS FACILITY ON PART OF LOT 225111 (PLOT A), JALAN GOPENG, KAWASAN PERINDUSTRIAN TUNGZEN, MUKIM SUNGAI RAYA, 31300 KAMPUNG KEPAYANG, PERAK DARUL RIDZUAN.”** Hereafter it will be known as the “Project”.

1.1.2 Project Background

The project is to conduct refined oil manufacturing via pyrolysis of rubber tire wastes and related feedstocks on part of Lot 225111 (Plot A), Jalan Gopeng, Kawasan Perindustrian Tungzen, Mukim Sungai Raya, 31300 Kampung Kepayang, Perak Darul Ridzuan. Therefore, an Environmental Impact Assessment (EIA) is required to be prepared under Schedule 1 of Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order 2015.

The Project is based on the concept of recovering and recycling solid wastes which consist mainly of rubber tire wastes. Other related feedstocks include waste plastics (such as HDPE, LDPE, and PS), decanter sludge and palm oil mill effluent (POME). The solid wastes will be obtained from local sources. Recovering solid wastes has numerous advantages especially to the environment, as it lessens the amount of greenhouse gases emissions and conserves the natural elements of the Earth besides reducing the need for a new sanitary landfill or the expansion of an existing one. Economically wise, the recovery plant helps to boost the surrounding economy as it provides job opportunities to the locals and other trading and commercial activities.

The main objective of the Project is to collect solid wastes consisting mainly of rubber tire wastes then undergo the process of pyrolysis to produce refined oil. The product will be sold to local buyers or exported to other buyers internationally. The refined oil, otherwise known as pyrolysis oil, is a complex mixture of organic compounds; contains a wide range of hydrocarbons, oxygenates (such as alcohols, acids, aldehydes and ketones), water and sometimes sulphur and nitrogen compounds, depending on the feedstock. The oil can be used in various industries as a fuel for industrial boilers, furnaces and generators. It can also be upgraded and re-refined into high quality phenols and methanol as well as transportation fuels such as diesel and petrol.

1.1.3 Location of the Project

The Project is located on part of Lot 225111 (Plot A), Jalan Gopeng, Kawasan Perindustrian Tungzen, Mukim Sungai Raya, 31300 Kampung Kepayang, Perak Darul Ridzuan. The Project's location is shown in **Figure 1.1**, **Figure 1.2** and **Figure 1.3**.

The land plot for Lot 225111 has a total land size of 4,698 m². The land title of the land plot is included in **Appendix 1.1** and the tenancy agreement is included in **Appendix 1.2**. The existing building plans is included in **Appendix 1.3**.

The geographical coordinates of the center of the Project site are latitude 4°30'43.7"N and longitude 101°8'56.5"E. The locality map of the Project site is shown in **Figure 1.1**. The Project boundary is tabulated in **Table 1.1** and is shown in **Figure 1.2**. The caption of the Project's boundary is shown in **Figure 1.3**.

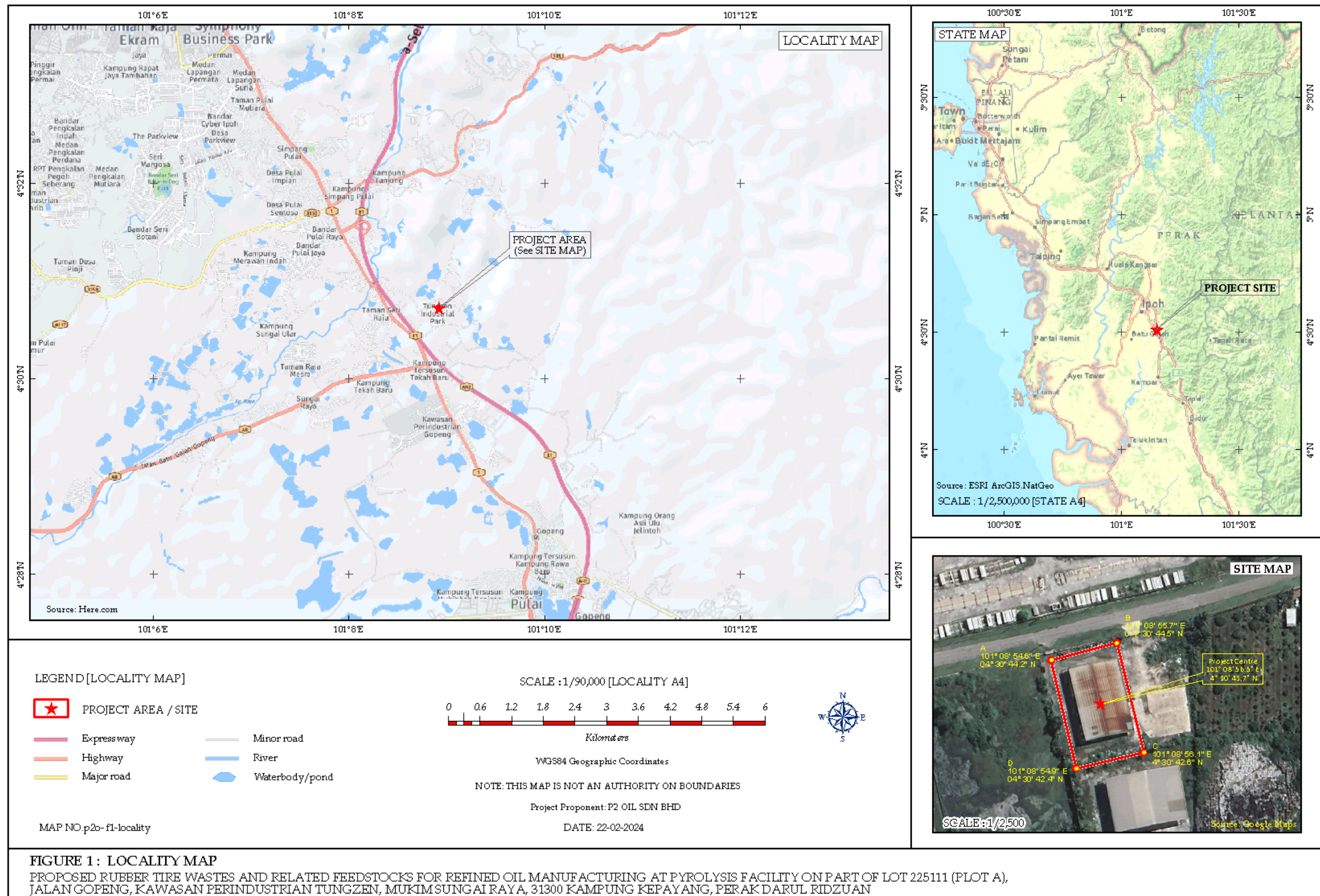


Figure 1.1: Locality Map



Figure 1.2: Google View of the Project Site Location (Not to Scale)

Table 1.1: Geographical Coordinates of Factory Boundaries

Point	Position	Northing	Easting
A	North-west Corner	4°30'44.20"N	101°8'54.55"E
B	North-east Corner	4°30'44.50"N	101°8'55.67"E
C	South-east Corner	4°30'42.63"N	101°8'56.13"E
D	South-west Corner	4°30'42.36"N	101°8'54.98"E
E	Centre	4°30'43.70"N	101°8'56.50"E

**Figure 1.3: Caption of Project Boundary**

1.1.4 Engagement with Relevant Agencies

Current status of engagement with relevant agencies for the Project is as listed in the table below.

Table 1.2: Current Status of Engagement with Relevant Agencies

Agency	Comments	Reference
Jabatan Alam Sekitar (DOE) Perak	- Project Proponent has received a reply from DOE Perak regarding the Project's Development Input (IP) dated 14 th August 2023. (Reference No.: AS(B)A91/110/621/017 Jilid 102(34))	Appendix 1.4
Jabatan Alam Sekitar (DOE) Gopeng	- In the process of application to DOE Gopeng.	-
Majlis Daerah Batu Gajah (MDBG)	- In the process of application to MPBG.	-
Jabatan Keselamatan dan Kesihatan Pekerja (JKKP) Perak	- In the process of application to JKKP Perak.	-
Jabatan Bomba dan Penyelamat Malaysia (BOMBA) Perak	- In the process of application to BOMBA Perak.	-
Polis Diraja Malaysia (PDRM) Perak	- In the process of application to PDRM Perak.	-
PLANMalaysia @ Perak	- In the process of application to PLANMalaysia @ Perak.	-

1.2 PROJECT PROPONENT AND QUALIFIED PERSONS

1.2.1 Project Proponent

The Project Proponent (PP) is P2 Oil Sdn Bhd (POSB). The contact details of the Project Proponent are appended below.

P2 Oil Sdn Bhd

Lot 225111, Jalan Gopeng,
Kawasan Perindustrian Tungzen,
Mukim Sungai Raya,
31300 Kampung Kepayang,
Perak Darul Ridzuan.

Contact Person : Tan Sheng Yan
Telephone No. : 016-323 4323
Email : calvintan0606@hotmail.com

1.2.2 EIA Consulting Firm

Green Earth Consultancy Sdn Bhd (GE) has been appointed as the Environmental Impact Assessment (EIA) Consulting Firm to conduct the EIA study and report preparation. GE has been operating for more than 5 years, providing environmental consulting and compliance services. The contact details of the firm are attached below.

Green Earth Consultancy Sdn Bhd

No. 28, Jalan Indah ¼,
Taman Universiti Indah,
43300 Seri Kembangan,
Selangor Darul Ehsan.

Contact Person(s) : Loh Tong Loy; Chong Shiau lun @ Abraham (EIA Consultant: CEP-CS0111)
Telephone No. : 013-351 8102; 03-5611 5157
Email : green_earth@live.com.my; chongsi@hotmail.com

All enquiries and correspondences pertaining to this report can be made directly to the above.

The EIA study team is formed by DOE Registered EIA consultants and led by Chong Shiau lun @ Abraham as the EIA team leader. The details of the qualified persons are presented in **Table 1.3** and **Table 1.4**.

1.2.3 Supporting Laboratory

Environmental sampling and analysis services for air, noise and water quality are performed by the following accredited laboratory:

EnviChem Consults Sdn Bhd (SAMM No.0686)

No. 5A-B & 7A-B,

Lorong Temenggung 15A,

Taman Evergreen,

41200 Klang,

Selangor Darul Ehsan

Telephone Number : 03-5161 7311 / 03-5162 7311 / 03-5166 3195

Facsimile Number : 03-5162 7312

Email : info@envichem.com.my

Contact Person : Ts. ChM. Dr. Nagendran Periaiah

Scope of Service : Noise, Air, Water and Groundwater Quality Baseline Monitoring

The SAMM certification of EnviChem Consults Sdn Bhd is included as **Appendix 1.5**.

Table 1.3: List of EIA Study Team Members

No.	Name	Qualification	Registration with DOE				Proposed Study Area	Signature
			Category	Area/Field	ID. No	Registration Expiration Date		
A. EIA Study Team Leader								
1.	Chong Shiau lun @ Abraham	MSc (Env Tech); BEng (Civil & Structure)	EIA Consultant	i) Wastewater ii) Solid Waste Management iii) Erosion & Sediment Control iv) Quantitative Risk Assessment v) Occupational Safety & Health	CEP-CS0111	31 May 2026	Wastewater Management; Waste Management; Erosion & Sediment Control (ESCP); Quantitative Risk Assessment; Occupational Safety and Health	
B. EIA Team Member								
2.	ChM. Tang Ching Ching	BSc (Chemistry)	EIA Consultant	i) Air Quality ii) Water Quality iii) Noise & Vibration	CEP-C0073	31 May 2024	Air Quality; Noise Quality; Baseline Monitoring for	

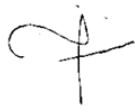
				Study iv) Baseline Monitoring v) Performance Monitoring			Water Quality	
3.	Agatha Francis Nasin	BA Public Management	Subject Specialist	Social Impact Assessment	CEP-SS0140	31 May 2024	Social Impact Assessment	
4.	Ahmad Nazri bin Saidin	MSc (Environmental Biology) BSc (Environmental Science)	EIA Consultant	Scheduled Waste	CEP-C0346	31 May 2025	Scheduled Waste Management	

Table 1.4: List of EIA Supporting Personnel

No.	Name	Qualification	Registration with DOE			Study Area	Supervised By	Signature
			Category	Area/Field	ID. No			
1.	Thaneissha A/P Marimuthu	BEng. Tech. (Energy & Environment)	Understudy as Assistant Consultant	-	-	Project Coordination, Land Use and Socioeconomic Assessment	Chong Shiau lun @ Abraham	

2.	Goh Zheng Lu	MSc (Sustainable Chemical Engineering); B. Sc (Chemical)	Understudy as Assistant Consultant	-	-	Drone Survey	Chong Shiau lun @ Abraham	
3.	Cheah Jin Xun	B. Eng (Environmental)	Understudy as Assistant Consultant	-	-	Air Pollution Control System	Chong Shiau lun @ Abraham	
4.	Freddy Lee	MSc GIS BSc Survey	-	-	-	GIS Mapping	Chong Shiau lun @ Abraham	

1.3 SURROUNDING ENVIRONMENT AND SENSITIVE RECEPTOR

The Project site is located within the Kawasan Perindustrian Tungzen, Mukim Sungai Raya. It is situated approximately 2.7 km southeast of Simpang Pulai and 4.7 km northwest of Gopeng.

Based on the existing land use map derived from site surveys and from Google Maps, the area within 3 km from the Project site mainly comprises of industrial areas in the south; residential and agricultural areas in the west; forest and industry areas in the north; residential and agricultural areas in the east.

The immediate neighboring lots to the Project site are unnamed factory. The detailed environmentally and socially sensitive receptor within 5 km radius of the study area is discussed in **Chapter 6** in the land use section.

1.4 LEGAL ASPECTS

1.4.1 Prescribed Activity

The Project falls under Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order 2015, Schedule 1 – Activity 14 (b)(ii) Solid Waste: Construction of recovery plant or recycling plant. Therefore, an EIA is mandatory under Section 34(A) Environmental Quality Act 1974 which requires the approval of an EIA report from the DOE. The activities specified in the First Schedule do not require public display and public comment. Hence, this EIA will consist of all the requirements for an EIA that range from the need for a comprehensive appraisal of the existing environment to assessing the activities that could cause potential impacts arising due to the operation of the Project.

1.4.2 EIA Study Approach

In general, the EIA study was undertaken in accordance with the general guidelines outlined in the Environmental Impact Assessment Guidelines in Malaysia 2016. The relevant Malaysian legislative requirements principally the Environmental Quality Act 1974 (Act 127) and its subsidiary regulations forms the compliance reference for this EIA.

The scoping notes for the Project are discussed in detail in **Chapter 2**.

1.5 CONFORMANCE OF PROJECT TO GOVERNMENT DEVELOPMENT PLAN

The Project site is in Kawasan Perindustrian Tungzen which is an industrial zone. The factory is mainly surrounded by other industrial factories including heavy industries.

1.5.1 National Physical Plan 4 (NPP-4)

In reference to the National Physical Plan 4 (NPP-4), the Project site is in Mukim Sungai Raya which is one of the industrial areas within Batu Gajah area. In terms of environmental sensitivity, The Project is located within the industry area (Kawasan Perindustrian Tungzen), outside of any environmental sensitive area (ESA). The assessment as per ESA framework criteria in accordance with Table 5-3 of NPP-4 as detailed as below:

Table 1.5: Assessment as per ESA Framework of NPP-4

No.	Area	Criteria	Assessment
RANK 1 - NO DEVELOPMENT AND CHANGE OF LAND USE			
1A	Existing Gazetted Terrestrial and Marine Protected Areas:	i. De-publication of protected areas is not allowed (If de-publication is allowed, it needs to go through a strict mechanism)	Project site is sited on one industrial lot within the industrial zone in Kawasan Perindustrian Tungzen. Therefore, it is outside the protected area system.
	i. National Park	ii. New development, expansion of existing development or extraction of mineral resources (all forms of mining) are not permitted	
	ii. State Park		
	iii. Wildlife Reserve	iii. An Integrated Management Plan should be prepared for these areas	
	iv. Permanent Reserve Forest (Protection Class)		
1B	v. Sea Parks	iv. Ecotourism, research, education, and low-impact development are allowed but subject to matters in the Enactment and Gazetting Act	Project site is sited on one industrial lot within the industrial zone in Kawasan Perindustrian Tungzen. Therefore, it is outside the forest reserve area.
	vi. Fishing Prohibited Area	*Related to the prescribed conditions	
	vii. Seaweed Protection Area		
	viii. Turtle Sanctuary		
1B	Permanent Reserve Forest (Production Class)	Sustainable logging is allowed based on the principles of Sustainable Forest Management	

1C	Forest Plantation Zones within Permanent Forest Reserves (Production Class)	Only allowed in HSK areas that have been zoned as forest plantation establishment zones in production forests by the 68th National Land Council dated 9 August 2012 where: i. Forest plantation zones are not allowed in areas where the value of ecosystem services and biodiversity is high ii. The area of the zone does not exceed 5% of the total area of natural forest in each state for a period of 7 years as stipulated in the forest management certification standard under the Malaysian Timber Certification Scheme iii. Forest plantation activities are proposed to apply the concept of agroforestry and mixed farming	Project site is sited on one industrial lot within the industrial zone in Kawasan Perindustrian Tungzen. Therefore, it is outside of the protected area system and forest reserve area.
1D	Areas of Biodiversity Interest but not Gazetted as Protected Areas: i. High Value Government Land Forest (e.g., mangrove, swamp forest, peat swamp forest, freshwater swamp forest, dark forest) ii. Geological Site	i. Journalism needs to be expedited and prioritised ii. New development, expansion of existing development or extraction of mineral resources (all forms of mining) are not permitted iii. An Integrated Management Plan is necessary provided for these areas iv. Ecotourism, research, education, and low impact development are allowed	Project site is sited on one industrial lot within the industrial zone in Kawasan Perindustrian Tungzen. Therefore, it is outside the biodiversity area.

	iii. Limestone Outcrop iv. Quartz Ridge v. Turtle & Loggerhead Landing Site vi. Seagrass Plains vii. Coral Reef Area Outside the Marine Park viii. Sites of Interest for Birds ix. Muddy Plains		
1E	Catchment Areas of Existing and Proposed New Dams	Land use activity is not allowed. Infrastructure facilities other than dam infrastructure are not allowed	Project site is sited on one industrial lot within the industrial zone in Kawasan Perindustrian Tungzen. Therefore, it is outside any dam catchment area.
1F	The Area Above the 1,000m Contour	Development, logging, and agriculture are not allowed	Project site is sited on one industrial lot within the industrial zone in Kawasan Perindustrian Tungzen. Therefore, it is below the 1,000 m contour.

RANK 2 - CONTROL OF SUSTAINABLE DEVELOPMENT AND USE			
2A	Recognised Terrestrial Ecological Corridors such as the Central Forest Spine Ecological Network	i. Any development should follow the strategy and comply with the guidelines in the Central Forest Spine 2 Master Plan	Project site is sited on one industrial lot within the industrial zone in Kawasan Perindustrian Tungzen. Therefore, it is outside any recognised terrestrial ecological corridors.
		ii. Special Area Plans should be prepared for ecological networks that are at a critical level as stated in the Central Forest Spine 2 Master Plan	
		iii. Only conservation agriculture* is allowed and wildlife corridors must be established	
		iv. Only the development of critical infrastructure is allowed such as highways, railways, and electricity transmission lines. But infrastructure needs to be designed and built in an environmentally friendly manner and not result in habitat fragmentation	
2B	The Marine Ecological Corridor Recognised as Ecologically and Biologically Sensitive Marine Areas (EBSA) and Important Marine Mammal Area (IMMA)	i. An Integrated Management Plan should be prepared to identify the corridor boundaries and outline specific management measures	Project site is sited on one industrial lot within the industrial zone in Kawasan Perindustrian Tungzen. Therefore, it is outside any marine ecological corridors.
		ii. Management zones should be established based on beneficial use following local needs and factors such as conservation, ecotourism, fisheries, and sustainable use	

2C	The Islands in the Marine Park Area	All development on the islands and within the marine park area must fully comply with existing and future guidelines	Project site is sited on one industrial lot within the industrial zone in Kawasan Perindustrian Tungzen. Therefore, it is not in any marine park area.
2D	Areas of Peat, Soft Soil, Sinkholes, and Former Underground Mines	i. A site suitability study should be carried out before this area is developed	Project site is sited on one industrial lot within the industrial zone in Kawasan Perindustrian Tungzen. Therefore, it is not in any peat, soft soil, sinkholes, and underground mines.
		ii. Development applications can be considered taking into account potential disaster impacts, engineering solution methods and development feasibility accompanied by approval conditions	
2E	River Reserve	i. Strips of land adjacent to the river are maintained as state land and gazetted according to reserve provisions; guided by the minimum width as recommended by the Department of Irrigation and Drainage	Project site is sited on one industrial lot within the industrial zone in Kawasan Perindustrian Tungzen. Therefore, it is not in any river reserve.
		ii. Existing development activities that operate without license and permission need to be identified and considered by the state authorities to go through the bleaching process or be moved/demolished if they pollute the river and cause a nuisance	

2F	Areas Exceeding the 1,000 m Contour that have been Developed and are Special Management Areas (KPK): i. Cameron Highlands-Kinta-Lojing ii. Genting Highlands-Bukit Tinggi-Janda Baik iii. Fraser Hill	A Special Area Plan (RKK) needs to be prepared as a development control for developed highland areas	Project site is sited on one industrial lot within the industrial zone in Kawasan Perindustrian Tungzen. Therefore, it is not in any special management area.
		New urban and agricultural development in highland areas is only allowed in two (2) KPKs, namely: i. Cameron Highlands-Kinta-Lojing, and ii. Genting Highlands-Bukit Tinggi-Janda Baik	
		New development is not allowed in Bukit Fraser KPK. Existing development needs to comply with the strategy and guidelines contained in the Fraser Hill Development Coordination Study	
2G	Area between Contours 150 m to 1,000 m	Any use complies with existing and future guidelines	Project site is sited on one industrial lot within the industrial zone in Kawasan Perindustrian Tungzen. Therefore, it is not in any area between 150 m and 1,000 m.
2H	Important Areas for Food Security: i. National Rice Granary Site ii. Permanent Garden of Food Production iii. Aquaculture Industrial Zone	i. These areas cannot be converted to other types of land use except for habitat restoration activities for uncultivated areas	Project site is sited on one industrial lot within the industrial zone in Kawasan Perindustrian Tungzen. Therefore, it is not in any area affecting food security.
		ii. Sustainable farming and fishing activities are allowed	
		iii. Sustainable extraction or use of resources is allowed	
		iv. Agricultural practices using Best Management Practices need to be implemented by entrepreneurs with close monitoring by the authorities	

2I	Water catchment area and groundwater recharge zone for well use	i. The catchment areas of the water intake level and the compensation zone need to be mapped at the RSN and RT levels	Project site is sited on one industrial lot within the industrial zone in Kawasan Perindustrian Tungzen. Therefore, it is not in any water catchment area
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Source: NPP-4, 2021 (Table 5-3)

1.5.2 Perak Structure Plan 2040

A review of the proposed Project against Rancangan Struktur Negeri (RSN) Perak 2040 revealed that the Project is in line with *Dasar Perancangan 20* on encouraging the efficient management of waste disposal to reduce the required total waste disposal. The policy statement is described as below:

Dasar Perancangan 20 (RSA 20): Meningkatkan Keberkesanan Sistem Infrastruktur dan Menekankan Amalan Teknologi Hijau Bagi Menyokong Pembangunan Negeri Perak

Strategik Pelaksanaan 20.6 (SP20.6): Menyediakan Pengurusan Sisa Pepejal dan Buangan Terjadual Secara Bersepadu Dengan Sistem Rawatan Sisa Berlandaskan Teknologi dan Tumpuan Kepada Pengawalan Terhadap Pencemaran

Review on the physical land development plan proposed in Rancangan Struktur Negeri Perak 2040 shows that the Project site is located within one of the Priority Development Area in Batu Gajah as shown in the **Figure 1.4**. The location of the Project within the Kawasan Perindustrian Tungzen is believed could help facilitate development in the surrounding area and compatible with the existing land uses. Also, based on **Table 1.6**, the estimated land use and physical development is expected to continue to increase in the coming years.

Table 1.6: Indicator of Land Use and Physical Development

Cadangan Indikator Perak 2040	Semasa (2015)	Cadangan Sasaran Pencapaian				
		2020	2025	2030	2035	2040
Luas tanah industri terancang diperlukan (hektar)	2,935	3,497	4,073	4,630	5,288	6,098

Source: Rancangan Struktur Negeri Perak 2040 (Jadual 7.9)

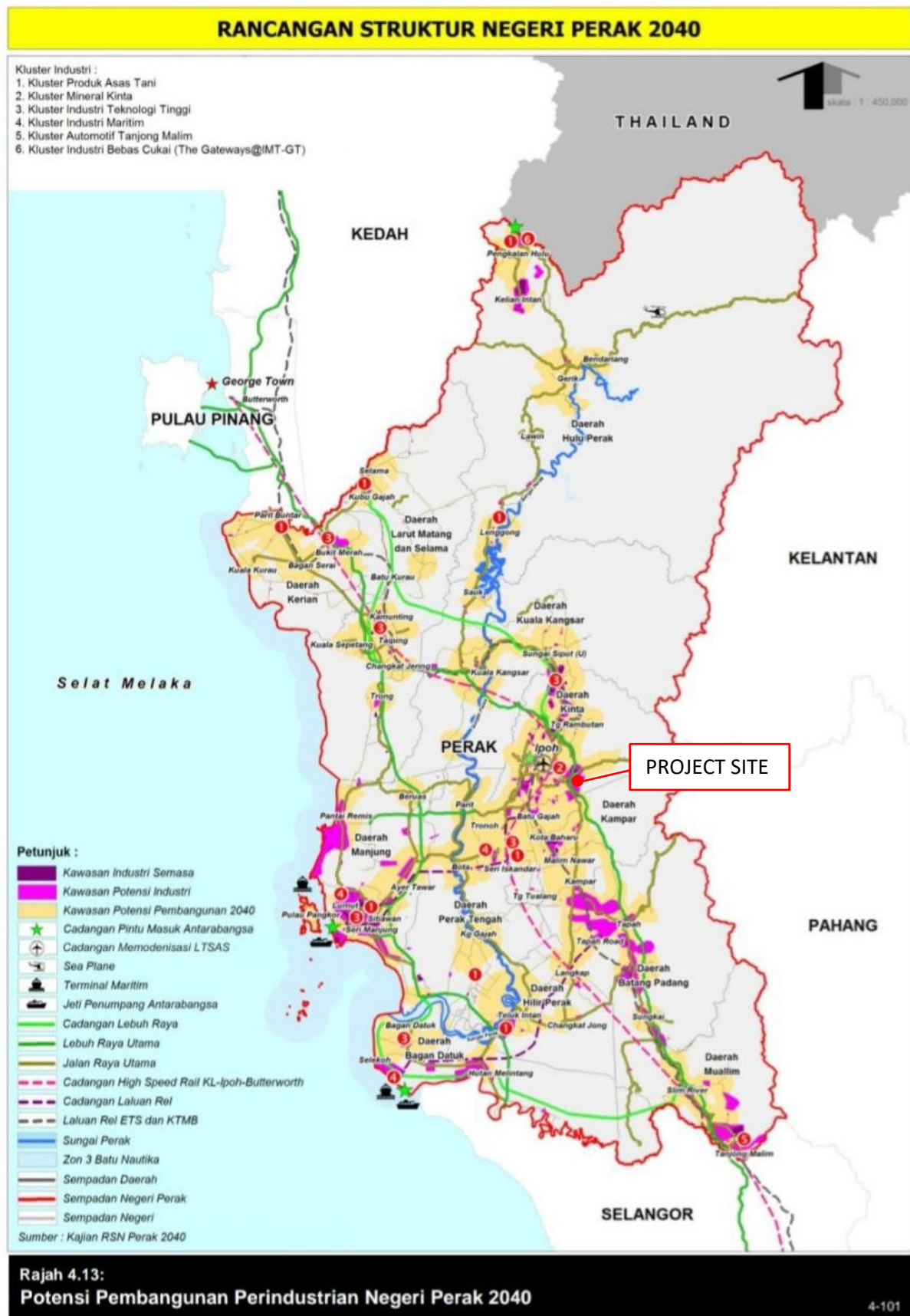


Figure 1.4: Industrial Development Cluster Plan

Source: Rancangan Struktur Negeri Perak 2040 (Rajah 4.13)

1.5.3 Rancangan Tempatan Daerah Batu Gajah 2025

A review of the proposed Project against Rancangan Tempatan Daerah Batu Gajah (RTDBG) 2025 revealed that the Project is in line with BPK 4.3a which states that the project site is suitable to be used as industrial area and is allowed for light, medium and heavy industries as shown in **Table 1.7** and the project site relation to Rancangan Tempatan Daerah Batu Gajah 2025 is shown in **Figure 1.5**.

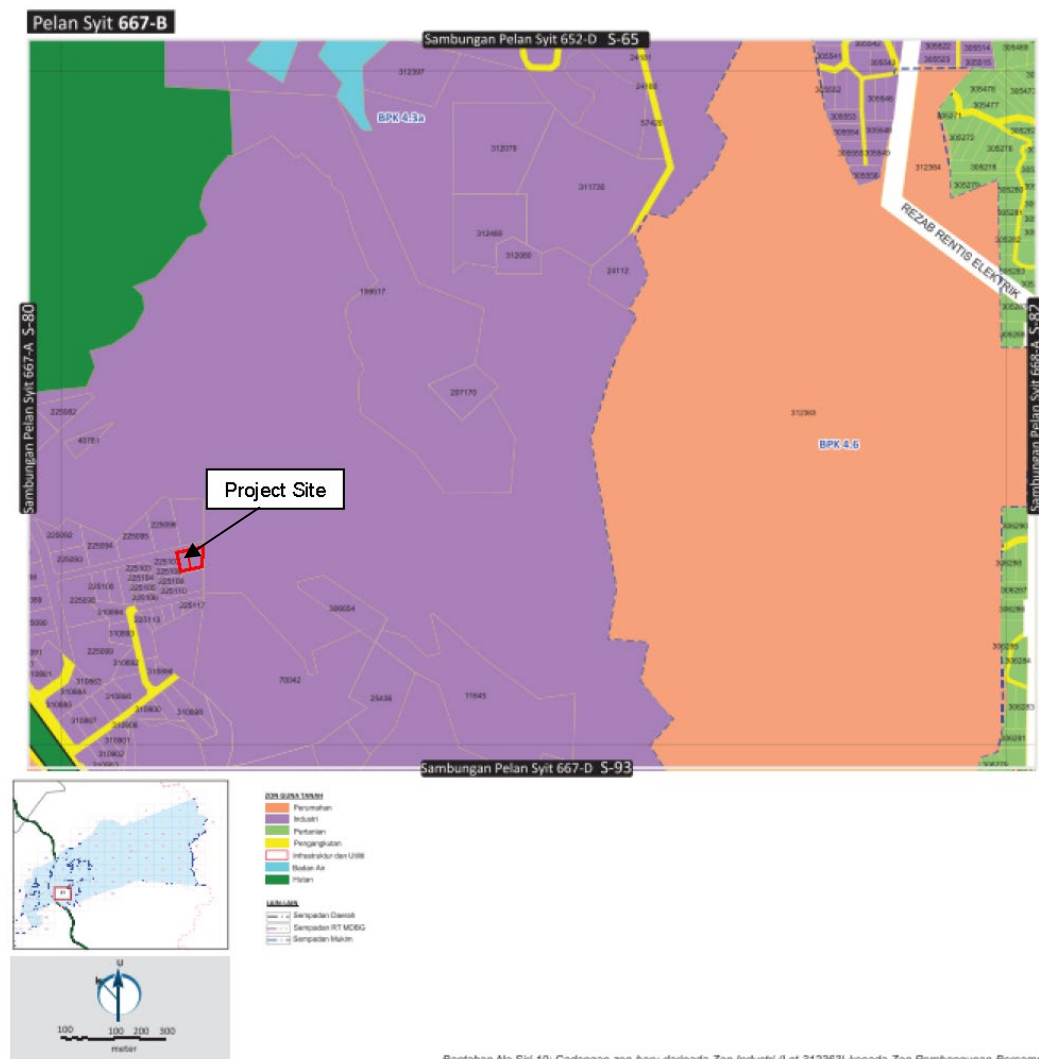
Table 1.7: Schedule of Land Use Map Index BPK 4.3a

BPK 4.3 ZON INDUSTRI (ZI) SIMPANG PULAI

BPK	KELUASAN (HEKTAR)	RUJUKAN PELAN INDEKS				DENSITI (UNIT/HEKTAR)	NISBAH PLOT	KETINGGIAN (MAKSIMUM)
		NO.PELAN SYIT	M/S	NO.PELAN SYIT	M/S			
4.3a Zon Industri Berat dan Berisiko Tinggi (ZIBRT) Simpang Pulai	2,170.1	637-C 637-D 652-C 652-D	s-36 s-37 s-64 s-65	653-C 667-A 667-B 667-D	s-66 s-80 s-81 s-93	-	1:2	5
BPK	KELUASAN (HEKTAR)	NO.PELAN SYIT		M/S		DENSITI (UNIT/HEKTAR)	NISBAH PLOT	KETINGGIAN (MAKSIMUM)
4.3b Zon Industri Kecil & Sederhana (IKS) Simpang Pulai	152.0	666-B 667-A		s-79 s-80		-	1:2	5

KOLUM I	KOLUM II	KOLUM III		KOLUM IV						
KELAS/AKTIVITI UTAMA		4.3a	4.3b							
JENIS GUNATANAH		ZIBRT	ZIKS	LAIN-LAIN SYARAT						
B PERINDUSTRIAN (1)										
	B1 Industri Berisiko Tinggi	B	T	Nisbah Plot & Ketinggian Bangunan:<table><tr><th>Nisbah Plot</th><th>Ketinggian Maksimum</th><th>Kawasan Plinth</th></tr><tr><td>1 : 2</td><td>5 tingkat</td><td>Tapak <1 ekar = 80%, Tapak >1 ekar = 60%.</td></tr></table> - Mendapat kelulusan dan penentuan syarat-syarat dan persetujuan MDBG, agensi teknikal dan bukan teknikal yang berkaitan. - Menyediakan kemudahan infrastruktur dan utiliti yang secukupnya dan perlu mematuhi garis panduan dan piawaian yang diguna pakai oleh MDBG, agensi teknikal dan bukan teknikal yang berkaitan. - Zon Penempatan & Jenis Aktiviti Yang Dibenarkan - Rujuk <i>Guidelines for Siting and Zoning of Industry and Residential Areas, Department of Environment (Okt 2012)</i>. - Pembangunan mana-mana kawasan yang berpotensi untuk tujuan mineral hendaklah dibenarkan dengan syarat: (1) Mendapat kelulusan dan penentuan syarat-syarat dan persetujuan agensi teknikal dan bukan teknikal yang berkaitan. (2) Mendapat kelulusan Kebenaran Merancang (KM) perlombongan sebelum kerja-kerja perlombongan dijalankan. (3) Mendapat kelulusan daripada Jabatan Alam Sekitar dengan penyediaan Penilaian Awal Tapak (AS-PAT-12) dan Laporan Impak Alam Sekitar (EIA).	Nisbah Plot	Ketinggian Maksimum	Kawasan Plinth	1 : 2	5 tingkat	Tapak <1 ekar = 80%, Tapak >1 ekar = 60%.
Nisbah Plot	Ketinggian Maksimum	Kawasan Plinth								
1 : 2	5 tingkat	Tapak <1 ekar = 80%, Tapak >1 ekar = 60%.								
	B2 Industri Berat	B	T							
	B3 Industri Sederhana	B	B							
	B4 Industri Ringan	B	B							
	B5 Industri Kotej	B	B							

Source: Rancangan Tempatan Majlis Daerah Batu Gajah 2025



1.5.4 Environmental Essentials for Sitting of Industries in Malaysia (EESIM)

A review against the existing land use of the study area revealed that there is no residential area recorded within the 250 m boundary from the Project site. The nearest settlement areas, namely Kampung Kurnia which are located within 0.93 km of Project boundary.

According to the latest DOE Guidelines for Environmental Essentials for Sitting of Industries in Malaysia (EESIM) 2017, the buffer requirement to be maintained within the industries to the nearest sensitive receptor shall refer to the NPP-4 and related local plans. The Project is located outside of the protected area and water catchment area under NPP-4.

The Project site is located within the Kawasan Perindustrian Tungzen. At present, the Project site is located in Lot 225111, Mukim Sungai Raya and shall be operational entirely within the lot. In addition, the facility will be equipped with necessary mitigation measures such as an air pollution control system (APCS) to minimize the potential environmental issues. The site will be monitored regularly for water quality, air quality and ambient noise level. The proposed Project is therefore not in conflict and compatible with the existing activities at the surrounding land use.

CHAPTER 2

SCOPING NOTES FOR EIA STUDY

CHAPTER 2 : SCOPING NOTES FOR EIA STUDY

This chapter provides information on the chronology of scoping notes prepared for the EIA and a summary of the scopes of study. This is to replace the Terms of Reference (TOR) section which has been exempted for Schedule 1 EIA Preparation from 1st January 2021, as instructed by Department of Environment (DOE) Headquarters.

2.1 PROJECT TITLE

This EIA Project is herewith referred to as the **“PROPOSED RUBBER TIRE WASTES AND RELATED FEEDSTOCKS FOR REFINED OIL MANUFACTURING AT PYROLYSIS FACILITY ON PART OF LOT 225111 (PLOT A), JALAN GOPENG, KAWASAN PERINDUSTRIAN TUNGZEN, MUKIM SUNGAI RAYA, 31300 KAMPUNG KEPAYANG, PERAK DARUL RIDZUAN.”** Hereafter it will be known as the Project.

2.2 PRESENCE OF SENTITIVE RECEPTORS

Generally, the existing environment and potential impact from the proposed Project will be assessed for a radius of 5 km from the Project boundary. The identified major elements of the environment, their nearest sensitive receptors and the study boundary are as tabulated in **Table 2.1.**

Table 2.1: Study Boundaries and Sensitive Receptors

Environmental Element	Identified Nearest Sensitive Receptor	Study Boundary
Water Quality	The identified existing water bodies and rivers within 3 km from the Project boundary: • Stormwater drainage system within Kawasan Perindustrian Tungzen • Sungai Raia	Within 5 km radius from the Project site
Air and Odour Quality	The identified air sensitive receptors within 3 km from the Project boundary: • Taman Seri Raia • Kampung Tekkah • Auasia Nutriculture (Agro Based Industry)	Within 5 km radius from the Project site

Noise Level	The identified noise sensitive receptors within 3 km from the Project boundary: • Taman Seri Raia • Kampung Tekkah • Auasia Nutriculture (Agro Based Industry)	Within 5 km radius from the Project site
Land Traffic	The identified existing road networks within 3 km from the Project boundary: • Jalan Gopeng • North-South Expressway • Jalan Ipoh-Kampar	Within 5 km radius from the Project site
Human Environment (Socio-economy)	The identified sensitive receptors within 3 km from the Project boundary: • Kampung Tekkah • Taman Herba • Taman Seri Raja • Kg Kurnia • Kampung Kepayang	Within 5 km radius from the Project site

2.3 SIGNIFICANT IMPACTS DUE TO THE PROJECT

The main environmental issues are anticipated to arise mainly during the operational phase of the Project. Detail of potential environmental significant impacts to be studied is shown in **Table 2.2**.

Table 2.2: Significant Environmental Impact During Operational Phase to be Studied

No.	Environmental Aspects	Operational Phase
1.	Risk	• Potential fire risk to the worker as well as the surrounding of the Project area. • The nearest residential area (Kampung Kurnia) is situated about 0.93 km from Project site.
2.	Water Quality	• Potential on direct water discharge into any of nearby natural water courses (stormwater drainage), which shall eventually lead to Sungai Raia, and later to Kinta River. • Improper discharge or leakage of fuel, lubricants, oils, or scheduled wastes can happen if there are improper handling, improper storage management and improper maintenance of machinery and equipment. Hazardous waste, oil and grease will contaminate the soil and subsequently pollute the receiving waterways. • Spillage or leakage during the loading and unloading activities outside of the containment bunds is a potential source of water pollution. • Surface runoff from the open space and parking area that could be accidentally contaminated with leakages or spillage of scheduled wastes (spent lubricant oil). • The discharge of the surface runoff could lead to degradation of surface water quality at the point of discharge and downstream drainage system of Sungai Raia and Sungai Kinta.

3.	Scheduled Waste Management	• Generation of sludge and oily waste from the oil sumps, empty diesel drums and containers, and oil-contaminated rags and gloves. Processes will be regularly and frequently inspected, maintained and if found faulty, to be repaired immediately. • Scheduled wastes spill and leakage from storage and during transportation, transfer handling and recovery operation activities.
4.	Ambient Air Quality	• Potential sources of air quality impacts are fugitive emissions from recovery and accidental occurrence. • Fugitive emissions during receiving, storage and recovery of scheduled wastes not properly manage at safe trace concentrations, as storage drums will be kept closed and sealed as per scheduled wastes storage requirements. • Exhaust emissions from vehicles during waste transport. • Lack of regular checking and maintenance of the air pollution control equipment and production equipment to mitigate dust and gaseous emission concentration.
5.	Noise Level	• Noise will be generated by machinery or equipment such as transport vehicles, pumps, forklifts, that are required in the daily operation of the off-site scheduled wastes storage facility. • Non-effective noise suppression system. • The nearest sensitive receptor (Kampung Kurnia) is approximately 0.93 km away from the boundary of the Project site. However, the noise emissions from the Project site are not expected to impact any sensitive receptors, as the Project site is situated within the industrial area.

2.4 IMPACTS WHICH ARE UNKNOWN BUT MAY OCCUR

The impacts identified in **Table 2.2** are the significant impacts which may occur due to this Project. However, there are no other unknown impacts which were identified due to this Project as the Project is a common type of industrial project which involves operation of a pyrolysis facility.

2.5 SOCIAL STUDY

At present, there are no ongoing social issues related to the Project. Nevertheless, a stakeholder engagement will be carried out via social survey to gauge the responses of nearby receptors towards the Project implementation. The social survey is to be carried out within 5 km from the project boundary and the responses are elaborated in **Chapter 7**.

2.6 SPECIAL REQUIREMENTS FOR THE EIA

The Project does not entail any special requirement for the EIA as the Project is located in an industrial area, so such ecological survey, public consultation etc., are not required. The baseline environmental quality survey locations for the project are shown in the tables below

Table 2.3: Baseline Water Quality Monitoring Stations

Location	Description	Coordinate	
		Latitude	Longitude
W1	Upstream (External Drain Before Project Site)	4°30'45.0"N	101°8'57.2"E
W2	Downstream (External Drain After Project Site)	4°30'44.3"N	101°8'54.3" E
W3	Downstream (Stormwater Drainage)	4°30'42.5"N	101°8'42.5"E
W4	Downstream (Stormwater Drainage)	4°31'01.0"N	101°8'17.4"E
W5	Downstream (Sungai Raya)	4°31'00.5"N	101°8'16.5"E

Table 2.4: Baseline Air Quality Monitoring Stations

Location	Description	Coordinate	
		Latitude	Longitude
A1	Project Boundary	4°30'44.4"N	101°08'54.6"E
A2	Nearest Shophouse at Taman Seri Raia	4°30'38.6"N	101°08'24.7"E
A3	Nearest House at Kg. Tekkah	4°30'05.6"N	101°08'48.6"E
A4	Entrance at Auasia Nutriculture (Agro-based Industry)	4°30'53.3"N	101°09'04.0"E

Table 2.5: Baseline Noise Quality Monitoring Stations

Location	Description	Coordinate	
		Latitude	Longitude
N1	Project Boundary	4°30'44.4"N	101°08'54.6"E
N2	Nearest Shophouse at Taman Seri Raia	4°30'38.6"N	101°08'24.7"E
N3	Nearest House at Kg Tekkah	4°30'05.6"N	101°08'48.6"E
N4	Entrance at Auasia Nutriculture (Agro Based Industry)	4°30'53.3"N	101°09'04.0"E

Table 2.6: Baseline Groundwater Quality Monitoring Stations

Location	Description	Coordinates	
		Latitude	Longitude
BH1	Boundary of Project Site	4°30'42.66"N	101°8'55.09"E

2.7 DESCRIPTION OF MODELLING TOOLS AND ASSESSMENT METHODOLOGIES

The prediction methods for assessment of the possible environmental impacts are summarized in **Table 2.7**.

Table 2.7: Major Prediction Methods for Assessment of Impacts

Impacts	Method of Assessment	Reference
Noise Quality	MASdBMap version 0.5 Model or equal	Guidelines for Environmental Noise Limits and Control, Third Edition 2021 (Reprint)
Air Quality	AERMOD View Modelling	- Malaysian Ambient Air Quality Standards, 2020 - Environmental Quality (Clean Air) Regulations 2014
Quantitative Risk	Qualitative or quantitative risk assessment to be conducted	Guidelines for Risk Assessment, DOE (2024)
Socio-economic	Socio-economic survey using questionnaire and face-to-face interview	N/A

CHAPTER 3

STATEMENT OF NEED

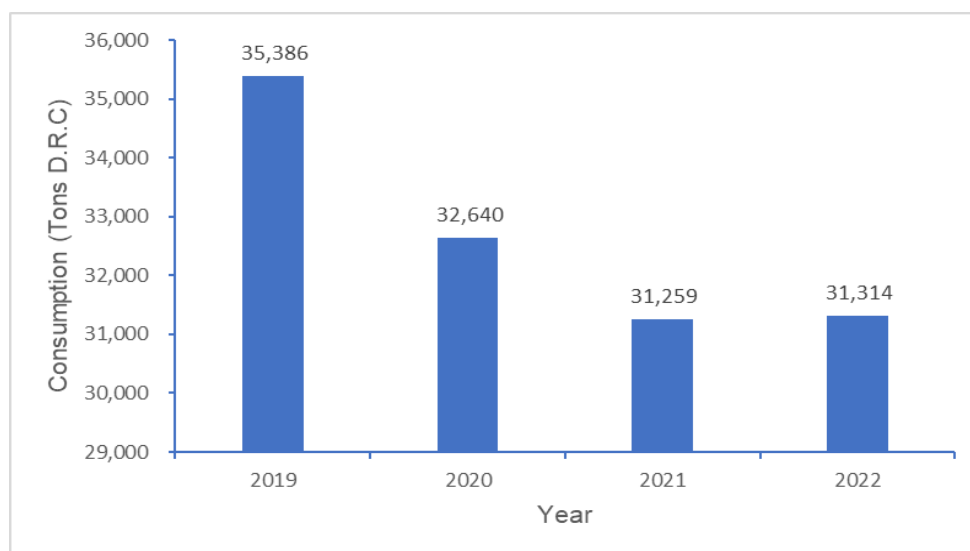
CHAPTER 3 : STATEMENT OF NEED

3.1 RUBBER TIRES

3.1.1 Rubber Demand for Tires in Malaysia

The demand for natural rubber by the tires and tubes industries in Malaysia has decreased by 11.51 percent, 35,386 tons D.R.C in 2019 to 31,314 tons D.R.C in 2022 as shown in **Figure 3.1** (Department of Statistics Malaysia, 2023). The decrease is due to the reliance of the aforementioned industries with the consumption of synthetic rubber for tires and tubes manufacturing. At least 60 percent of rubber used in the tire industry is synthetic rubber, which is produced from petroleum-derived hydrocarbons whereas the remaining 40 percent of rubber used is natural rubber (Michelin, 2023).

Synthetic rubber provides tires with a high-grip property, where the elastomer is able to deform under stress and return to its normal shape after the stress is removed (Morris, 1989). Other than that, synthetic rubber increases the rolling resistance and lifespan of rubber tires. The demand for synthetic rubber by the automotive industry accounts up to 65 percent of total demand and is expected to increase at a CAGR of 3 percent to 4 percent from the year 2022 to the year 2025 (Vantage Market Research, 2022).



*D.R.C: Dry Rubber Content

Figure 3.1: Domestic Consumption of Natural Rubber by Tires and Tubes Industries from Year 2019 to Year 2022

Source: Department of Statistics Malaysia, 2023

3.2 DEMAND FOR RECOVERY OF RUBBER TIRE WASTES IN MALAYSIA

A used rubber tire will end up as a waste once it has reached the end of its lifespan or it has undergone wear and tear as well as unanticipated damage. Tire wastes that end up in landfills or illegal dumping sites are detrimental to the environment and human health. High concentration of tires in one area poses a high risk of catching fire when subjected to fire hazards. Burning of tires emit gases such as methane, carbon monoxide and nitrous oxide, which are detrimental to the surrounding business and residential areas. The burning also releases high amount of black smoke that contains volatile organic compounds (VOCs) into the air. This disrupts the surrounding air quality and visibility.

Besides, accumulation of tires in landfills or dumping sites provide breeding ground for vector mosquitoes such as *Aedes aegypti*. This is possible due to the presence of stagnant water in the inner part of the tires over time. The spread of communicable diseases such as dengue and malaria will occur rapidly. To combat these detrimental problems, the Project Proponent has planned to take necessary steps through this Project to recycle and recover rubber tire wastes, which is also beneficial to the economy.

The recovery of materials from rubber tire wastes proves to be beneficial for other economic sectors. Recovery of crumb rubber is useful in construction of roads and manufacturing of as it increases the cohesiveness of binding aggregates. The pyrolysis oil produced from the pyrolysis of used rubber tires has the potential to be converted into diesel fuels for motor vehicles. The recovery of materials reduces the dependency of many economic sectors in obtaining natural resources for production, construction, or manufacturing of products. Over the years, the demand for recovery of rubber tire wastes in Malaysia, especially in Perak State will increase to meet the supply and demand of rubber materials and fuel. Other than that, the activity of the Project will boost the recycle rate of used tires in Perak State, which is currently at an estimation of 15 percent in a year.

It is anticipated that with the operation of the Project, more waste recovery and disposal options would be available to the rubber tire wastes generators in Perak. This will help to promote the concept of 4Rs (Reduce-Reuse-Recycle-Recover) and indirectly discourage indiscriminate disposal of solid wastes. This Project helps the 12th Malaysia Plan 2021-2025 targets to increase the recycling rate of solid wastes by 40 percent in the year 2025 (Prime Minister's Department, 2023).

The establishment of an off-site recovery facility in Kawasan Perindustrian Tungzen will serve as a rubber tire wastes recovery facility for Perak.

The Project helps to achieve Sustainable Development Goal (SDG) 12 - Responsible Consumption and Production of the 2030 Agenda and it aligns with the concept of circular economy as the products and materials are reused, recycled or recovered and thus maintained in the economy for as long as possible, along with the resources of which they are made, and the generation of waste, especially hazardous waste, is avoided or minimized, and greenhouse gas emissions are prevented or reduced. (GOAL 12: Sustainable consumption and production, n.d.)

Rubber tire waste generators, e.g., motor vehicle service centers, are focusing on making their businesses profitable. They will generally regard wastes as an expenditure item to be minimized and are reluctant to spend capital for on-site processing of their rubber tire wastes. Thus, for the 4R Policy to work effectively, off-site recycling and recovery facilities should be encouraged and established, also allowing for competition, so that waste generators will have alternatives for minimizing the costs of rubber tire wastes disposal by outsourcing the solid waste management to approved off-site rubber tire wastes recovery facilities.

3.3 VARIOUS BENEFITS FROM THE PROPOSED PROJECT

The proposed Project will give benefit not only to the environment but also to the economy. The rubber tire waste recovery industry is in line with the state's aspiration for better solid waste management and regulatory control. This Project also shall help to enhance the employment sector within the vicinity of the Project site which is mostly relying on the industrial sector for providing sustainable jobs.

Environmental Benefits

The following environmental benefits are expected from the proposed Project:

- Reduce usage of energy and oil for the production of new materials thereby conserving natural resources.
- Reduce soil and water pollution via the reduction of quantity of rubber tire wastes that needs to be disposed and indirectly prevent illegal dumping which causes environmental degradation.
- Reduce the circulation of non-biodegradable substances in the environment.
- Develop a sustainable green economy for the solid wastes recovery industry.
- Safe recycling of rubber tire wastes instead of illegal dumping.
- Recovery of rubber tire wastes which can be transformed into other useful items.
- Elimination of mosquito breeding sites, which is one of the principal causes of the spread of communicable diseases such as dengue and malaria.

Economic Benefits

In terms of economic benefit, the project will improve the economy by:

- Reducing solid wastes handling cost – in general, recycling fees are less expensive than disposal fees at prescribed premises.
- Reducing the cost of materials for manufactures as well as consumers through recycling and recovery practices.
- In some cases, recovered materials are good as or even better than, some virgin materials
- Employment creation for local residents, which shall offer more jobs when compared to transporting of rubber tire wastes for disposal.
- Potential saving in cleaning up illegal dumping of solid wastes.

3.4 CONCLUSION

The solid waste facility in this Project will introduce a new dimension to the economics of the industry or manufacturing sector besides serving the rubber tire waste generators. The economic activities directly created include collection, transportation and recovery from wastes, sales of recovered products and disposal of rubber tire wastes. Indirect services created include environmental consultancy, impact assessment, management and monitoring services by professionals. These economic activities and benefits are derived from the policy to upgrade environmental consciousness, conservation and responsibility of all waste generators. The need for this Project is therefore justified on environmental and health point of view besides offering scope for economic growth as well as business and job opportunities.

CHAPTER 4

PROJECT OPTIONS

CHAPTER 4 : PROJECT OPTION

4.1 INTRODUCTION

The purpose of the Project is to recover rubber tire wastes from industries in the surrounding areas. The waste recovery activity provides economic benefits to the locals through job opportunities and other trading and commercial activities, and the people in Perak State. The Project is well placed in an industrial zone, making it easy to get power supply and manpower. Furthermore, it is easy to access factory for materials using transportation as it is placed near a major connected highway and main access roads.

4.2 PROJECT OPTIONS

4.2.1 No Project Option

If the “No Project” option is chosen, no opportunities and benefits will be delivered to the local population and authorities from changing to a higher value use of the area. Besides, P2 Oil Sdn. Bhd. and Perak State government need to decide on the alternative site(s) for recovery of the rubber tire wastes.

4.2.2 With Project Option

With the commencement and operation of the Project, the advantages are envisaged below:-

- a) Local premises (who generates rubber tire wastes) will benefit, as it will help them to reduce potential environmental liability and reduce financial cost of waste management for greater industrial competitiveness.
- b) The Project promotes the strategy of rubber tire waste reduction by recycling and introduce competition for environmental waste treatment and management companies for greater efficiency.
- c) The Project will alleviate the issues of illegal dumping of rubber tire wastes. Thus, it will provide sustainable integrated solid waste management for both industries and the environment.
- d) The Project will generate more employment and business opportunities in local residents and more choices to the locals for working in this solid waste recovery industry.

4.2.3 Technology Option

There are a few technology options being considered during technology selection study by the Project Proponent. The chosen technology has been procured due to following reasons:-

- a) The pyrolysis reactor to be procured is a best available technology (BAT) and is heated using electricity (clean process). It is also equipped with a wet scrubber system, which reduces dust and gas emission during the pyrolysis process.
- b) Used rubber tire wastes can be recycled and recovered as crumb rubber, which can be mixed with asphalt to improve the properties of asphalt used in road construction. This includes high resistance to deformation at increased road temperature and improved adhesion between binder and aggregates. Other than that, crumb rubber can be used to manufacture running tracks and playground mats. It can be also used as a soil infill in sports and playing fields to provide traction and cushioning.
- c) Used rubber tire wastes can be recycled into new tires. Recovered rubber can be used to manufacture tires with a composition of 90 percent virgin rubber material.
- d) Refined oil produced from pyrolysis process can be utilized as fuel for industrial boilers, generators and furnaces. It can also serve as feedstock for producing chemicals such as methanol and phenols or upgraded into higher-value products such as gasoline, diesel and chemicals through processes like hydroprocessing.
- e) Air pollution control system (APCS) is a best available technology (BAT) with very high efficiency of 99.9% in filtration and recovery of air borne dusts.

4.2.4 Land Use Compatibility

Information on the existing land use of the Project site and its surrounding areas is based on the satellite images and field survey carried out in June 2022. The Project site is located within a developed industrial area. A summary of the key existing land use parameters is provided in **Table 4.1** and shown in **Figure 4.1**.

Table 4.1: Existing Land Use within 5 km Radius from the Project Site

Distance from Project Site	Key Existing Land Use Parameters
0 – 250 m	The dominant land use within 250 m from the Project site is industries. <u>Factory</u> • Unnamed Factory (Grey Roof) • Unnamed Factory (Blue Roof) • DNK Metal Recovery (M) Sdn Bhd • Metric Concrete Industries Sdn Bhd • Labzinc Industries (M) Sdn Bhd • Meranti Indah Sdn Bhd
250 m – 1 km	The dominant land use within 250 m - 1 km from the Project site are industries, commercial and worship areas. <u>Factory</u> • Megatrax Plastic Industries Sdn Bhd • Gopeng Kalsium Sdn Bhd • Sin Yong Guan Food Industries Sdn Bhd • Shen Fei Enterprise • ATP Business Solution • Meng Siang Plastic Sdn Bhd • Trans Reliance Logistics Sdn Bhd • Unioleo Sdn Bhd • Rancak Asia Sdn Bhd • Kitaran Recovery Sdn Bhd • Central Geo Sdn Bhd • Lip Tack Engineering Sdn Bhd

Distance from Project Site	Key Existing Land Use Parameters
	• Mrc Industries Sdn Bhd • W O Plastic Sdn Bhd • Simpang Pulai Premix Plant Sdn Bhd • Cmi Construction Material Industry Sdn Bhd • Acon Sdn Bhd • Alam-Con Sdn Bhd • Timberdeck Sdn Bhd • Supreme Trans Logistics Sdn Bhd Depoh • Gen Master Manufacturing Sdn Bhd • Pyramid Lane (M) Sdn Bhd • Kam Chuen Tin Smith <u>Amenities</u> • Restoran Nadia Thai Food • Restoran Imran <u>Worship</u> • Gua Naga Mas (Buddhist Temple)
1 km – 3 km	The dominant land use within 1 km – 3 km from the Project site are industries, residential areas, institutions, commercial and worship areas. <u>Factory</u> • K2 Bitumen Sdn Bhd • Srt Teck Realistic • Majuperak Solar Power Plant • Mega Vet Feedingstuffs Sdn Bhd • Ocean Glory Seafood Sdn Bhd • Tehki Food Manufacturing Sdn Bhd • Lotus's Distribution Centre • Leng Wah Fishery Sdn Bhd • Agro Bazaar • Veg Station (M) Sdn Bhd • Dk Frozen Food Sdn Bhd

Distance from Project Site	Key Existing Land Use Parameters
	• S.R. Marble Simpang Pulai Factory • Britestone Gml Quarry Sdn Bhd • Cabaran Granite Sdn Bhd • Agrostone (Malaysia) Sdn Bhd • One Ice Enterprise • Azfar Food Industry <u>Worship</u> • Surau Al-Adha • Chinese Cemetery Kg Kepayang • Masjid Nur Ramadhan • Kuil Sri Siva Subramaniam • Kong Fook Ngam Cave Temple • Gurdwara Sahib Kampung Kepayang <u>Residential Areas</u> • Kampung Tekkah • Taman Herba • Taman Seri Raja • Kg Kurnia • Kampung Kepayang <u>Amenities</u> • Agro Bazaar • J&T Express Perak-Ldc Gopeng • Pejabat Penghulu Mukim Sungai Raya • The Treasure @ Taman Herba Gopeng • Cengkerik Eco Park <u>Institution</u> • Madrasah Al-Ridhuaniah • Sekolah Kebangsaan Sungai Raya, Perak

3 km – 5 km	The dominant land use within 3 km – 5 km from the Project site are industries, residential areas, institutions, commercial and worship areas. <u>Factory</u> • Tkn Pulau Quarry Sdn Bhd – Quarry • Cao Minerals Sdn Bhd • Uniko Calcium Carbonate Industry Sdn Bhd • Imerys Minerals Malaysia Sdn Bhd • Tct Farm Sdn Bhd • Asia Meranti Solar (Kampar) Sdn Bhd – 10 MWAC LSSPV • Eurostar Tractors (M) Sdn Bhd • Vsafe Food Products Sdn Bhd <u>Worship</u> • Chinese Cemetery • Arulmigu Dewa Muniswarar Alayam • Surau Al-Taqla • Surau Kampung Tualang Tujuh • Surau Kampung Sungai Ular • Masjid Sayyidina Umar Al-Khattab • Surau Al-Falah • Buddhist Temple Dewi Loong Tou San • Surau Islamiah Taman Bersatu <u>Residential Areas</u> • Taman Gopeng • Taman Raia Indah • Simpang Pulau <u>Amenities</u> • Dewan Serdang Permai • Dewan Komuniti Taman Bersatu • Simpang Pulau Pasar • Kompleks Vektor Pejabat Kesihatan Kinta • Simpang Pulau Rural Clinic
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	<u>Institution</u> • SJK (C) Man Ming • Sekolah Rendah Al-Ihsan (Seri) • Sekolah Menengah Kebangsaan Simpang Pulai • Sekolah Kebangsaan Simpang Pulai • SJK (C) Phui Ying Simpang Pulai
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Key Land Use within 1 km of the Project Site	
 22 Jun 2022 11:22:55 am 4°30'43" N 101°8'52" E Jalan Tanpa Nama Gopeng Perak	 22 Jun 2022 11:24:05 am 4°30'40" N 101°9'4" E Jalan Tanpa Nama Kampung Kepayang Perak
Meranti Indah Sdn Bhd	Labzinc Industries Sdn. Bhd.
 22 Jun 2022 11:22:17 am 4°30'42" N 101°8'43" E Kampung Kurnia Kampung Kepayang Perak	 22 Jun 2022 11:21:21 am 4°30'43" N 101°8'49" E Kampung Kurnia Kampung Kepayang Perak
Gopeng Kalsium Sdn. Bhd.	DNK Metal Recovery (M) Sdn. Bhd.
 22 Jun 2022 11:21:37 am 4°30'43" N 101°8'48" E Kampung Kurnia Kampung Kepayang Perak	 22 Jun 2022 11:26:34 am 4°30'44" N 101°8'42" E Jalan Tanpa Nama Kampung Kurnia Gopeng Perak

Metric Concrete Industries Sdn. Bhd.	Shen Fei Enterprise
	
Sin Yong Guan Food Industries Sdn. Bhd.	Unioleo Sdn. Bhd.

Figure 4.1: Nearby Sensitive Receptors

4.2.5 Environmental Acceptability

The Project area is not classified as an environmentally sensitive area (ESA) in the National Physical Plan 4, and Rancangan Tempatan Daerah Batu Gajah 2025. During the site investigation carried out in June 2022, there was no significant vegetation at the factory and in the surrounding area. No flora and fauna with conservation value has been observed, and therefore the Project will not cause any loss in biodiversity. The surrounding of the Project site is designated for industrial park development and there are some existing industry establishments within the industrial area.

The Project provides an alternative off-site solid waste recovery facility to help reuse, reduce, recycle and recover rubber tire wastes. The Project concept will reduce disposal of used rubber tires which otherwise will have environmental cost to the society. This environmental-friendly concept and approach will help preserve and enhance the environmental quality. The Project is therefore compatible with DOE's policy.

4.2.6 Socially Sensitive Area

The Project site is located in Kawasan Perindustrian Tungzen, which is an industrial zone. The factory is mainly surrounded by other industry factories.

4.3 EVALUATION

The justification in favor of the 'With Project' option is based on the following:

- a) Local premises (who generates rubber tire wastes) will benefit, as it will help them to reduce potential environmental liability and reduce financial cost of waste management for greater industrial competitiveness.
- b) The Project promotes the strategy of rubber tire waste reduction by recycling and introduce competition for environmental waste treatment and management companies for greater efficiency.
- c) The Project will alleviate the issues of illegal dumping of rubber tire wastes. Thus, it will provide sustainable integrated solid waste management for both industries and the environment.
- d) The Project will generate more employment and business opportunities in local residents and more choices to the locals for working in this solid waste recovery industry.

If "No Project" option is considered, following will be the verdict:

- a) No physical changes of the existing site.
- b) No additional employment opportunities to the locals surrounding the proposed Project site.
- c) There may be more illegal disposal of used rubber tires.
- d) The used rubber tires are wasted as it could have been repurposed into something useful.

Based on the above justification, it is clearly seen that the benefits from the "With Project" option far out-weigh the costs and the "No Project" option. The Project option is a sustainable, commercial response to solve the problem of rubber tire wastes generated. The proposed Project should therefore be allowed to contribute to industrial development, to the environment and to society. The evaluation of the project options is shown in **Table 4.2**.

Table 4.2: Evaluation of the Project Options

Criteria	No Development	With Development
Land use compatibility	Status quo	Improvement (+)
Environmental consideration	May degrade (-)	Improvement (+)
Socio-economic acceptability	May degrade (-)	Status quo

(+) positive option (-) negative option

CHAPTER 5

PROJECT DESCRIPTION

CHAPTER 5 : PROJECT DESCRIPTION

5.1 PROJECT LOCATION

The Project is located at part of Lot 225111 (Plot A), Jalan Gopeng, Kawasan Perindustrian Tungzen, Mukim Sungai Raya, 31300 Kampung Kepayang, Perak Darul Ridzuan. The geographical coordinates of the center of the Project site are latitude 4°30'43.7"N and longitude 101°8'56.5"E. The locality map of the Project site is as depicted in **Figure 5.1**.

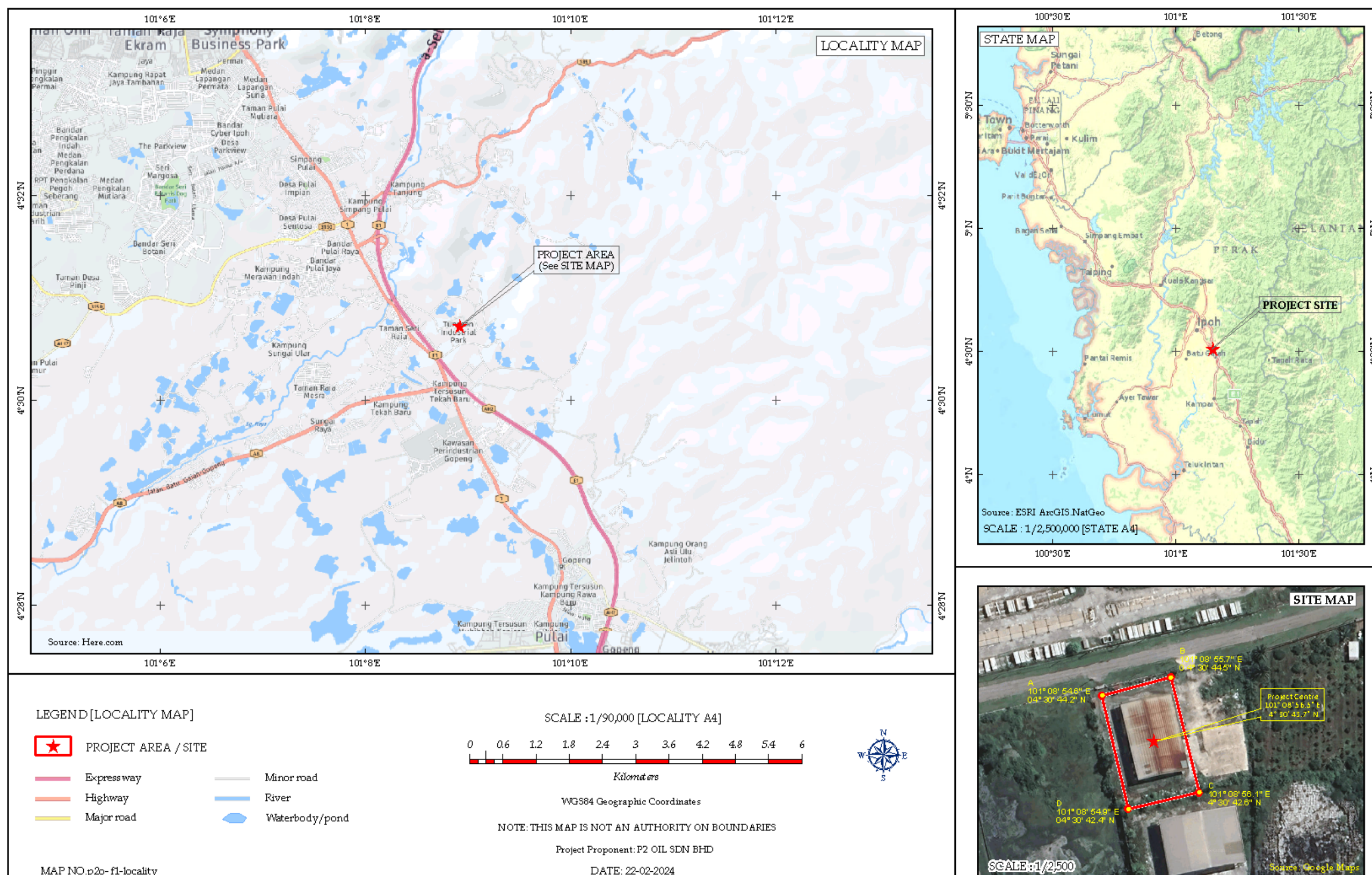


Figure 5.1: Locality Map

5.2 PROJECT CONCEPT

The Project is based on the concept of recovery of rubber tire wastes and related feedstocks while minimizing the adverse impacts to the environment. Rubber tire wastes recovery will give direct benefit to the general public of the State of Perak and at the same time provides economic benefits to the locals through job opportunities and other trading and commercial activities.

The refined oil manufacturing at the pyrolysis facility is to achieve the following objectives:

- 1) Develop rubber tire wastes and related feedstocks recovery facility to cater the growing industry in the surrounding area where waste generation is increasing rapidly.
- 2) Introduce a realistic and an effective integrated environmental management service to help solve the growing problem of rubber tire wastes generation.
- 3) Contribute to minimize the quantity of rubber tire wastes that ultimately needs to be disposed in an environmentally sound manner.
- 4) Contribute to reduction in waste treatment and disposal cost, illegal dumping and environmental degradation.

5.3 PROJECT COMPONENTS

P2 Oil Sdn Bhd (POSB) as the Project Proponent (PP) intends to provide a refined oil manufacturing using rubber tire wastes and related feedstocks via pyrolysis on the proposed site. This is to enable recovery activities to be conducted in an environmentally friendly, social-friendly, and sustainable manner. The chosen development site is designated for medium industrial processes within Kawasan Perindustrian Tungzen in Perak.

The development site for the Project is on a plot of 4,698 m² land area. The Project is to establish and operate a refined oil manufacturing activity at a pyrolysis facility complete with a flaring chamber (APCS 1) and a wet scrubber (APCS 2). The manufacturing facilities shall be installed and commissioned. APCS shall be commissioned and operated to support operation of rubber tire wastes and related feedstock wastes recovery.

The main Project components at the manufacturing facility consisted of:

- 1) Material loading and unloading area.
- 2) Office building.
- 3) Toilets.
- 4) Factory for processes such as crushing, wire stripping, pyrolysis, condensation, and screening of incoming materials (rubber tire wastes, plastic wastes, decanter sludge and POME sludge). The finished goods that will be produced includes refined oil (pyrolysis oil), carbon black and steel wires.
- 5) Storage areas for incoming materials and finished goods.
- 6) Flaring chamber (APCS 1).
- 7) Wet scrubber (APCS 2).
- 8) Supporting utilities and civil infrastructures including road, drainage system, septic tank and fire hydrant system.

The Project layout is shown in **Figure 5.2**, while a PE endorsed plan of the Project Layout is depicted in **Appendix 5.1**.

5.3.1 Project Description

The Project Proponent (PP) intended to establish a refined oil manufacturing activity at a pyrolysis facility to recover rubber tire wastes and related solid wastes (raw materials). The source of the raw materials shall be from solid wastes, as follows:-

Solid Waste Sources

- 1) Rubber Tire Wastes (Local Source)
- 2) Plastic Wastes (Local Source)
- 3) Decanter Sludge (Local Source)
- 4) POME Sludge (Local Source)

There will also be a waste acceptance control to be implemented at the project site. **Table 5.1** below shows the Waste Acceptance Criteria (WAC) that lists down specific type of waste that will be screened once it arrives at the premise.

The WAC shall stipulate acceptable and unacceptable waste category that shall be understood by waste generators, in particularly the wastes transporters. Acceptable wastes are incoming wastes that can be accepted and further processed and not comingled. While unacceptable waste will be rejected from entry, and not to be further processed. The unacceptable wastes as shown in **Table 5.2** will be rejected at entry point and waste transporters are responsible to manage and dispose it at licensed facilities regulated by Local Authorities and/or Department of Environment. Awareness campaigns and briefing shall be conducted by PP, with assistance and collaboration of the relevant agency to ensure waste generators and waste transporters understand the WAC and shall only transport wastes to be tipped at the site in suitable form.

Table 5.1: Waste Acceptance Criteria (WAC)

No.	Main Criteria	Definition
1.		Rubber Tire Wastes
a)	Acceptable	<u>Appearance</u> Homogenous (clean and not contaminated). <u>Material Composition</u> Rubber content between 41% to 48%. <u>Recovery Rate</u> Minimum 50% recovery.
b)	Unacceptable	<u>Appearance</u> Non-homogenous and/or contaminated with other solid wastes or scheduled wastes. <u>Method of Handling</u> Material which does not meet WAC will be returned to supplier.

2.	Plastic Wastes	
a)	Acceptable	<u>Appearance</u> Homogenous (does not contain hazardous materials). Solid and in dry form. <u>Material Composition</u> All types of plastics except halogen-containing plastics and PVC plastics. <u>Recovery Rate</u> Over 60% recovery.
b)	Unacceptable	<u>Appearance</u> Non-homogenous. Contaminated with other solid wastes or scheduled wastes. <u>Method of Handling</u> Material which does not meet WAC will be returned to supplier.
3.	Decanter Sludge	
a)	Acceptable	<u>Appearance</u> Homogenous. Drum form: Plastic or metal drum. <u>Material Composition</u> Decanter cake with less than 70% moisture or which is dewatered. <u>Recovery Rate</u> Minimum 30% recovery.
b)	Unacceptable	<u>Appearance</u> Non-homogenous. Contaminated with other solid wastes or scheduled wastes. Leakage in storing drums.

		<u>Method of Handling</u> Material which does not meet WAC will be returned to supplier.
4.	POME Sludge	
a)	Acceptable	<u>Appearance</u> Homogenous. Drum form: Plastic or metal drum. <u>Material Composition</u> Sludge cake with less than 70% moisture or which is dewatered. <u>Recovery Rate</u> Minimum 30% recovery
b)	Unacceptable	<u>Appearance</u> Non-homogenous. Contaminated with other solid wastes or scheduled wastes. Leakage in storing drums. <u>Method of Handling</u> Material which does not meet WAC will be returned to supplier.

Table 5.2: Unacceptable Waste Types

No.	Waste Type	Description
1.	Scheduled Waste	All listed scheduled wastes (SW) as regulated under Environmental Quality (Scheduled Wastes) Regulation 2005 excluding SW 110 and SW 422 that meet WAC.
2.	MSW Comingled	MSW mixed with scheduled wastes or various type of wastes.
3.	Clinical Waste	Wastes from hospitals, clinics, medical centers or clinical facilities.
4.	Radioactive Waste	Radioactive waste generated from hospitals or other licensed imaging facilities.

5.	Others	Other type of waste that is not mentioned in the table above.
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From **Figure 5.2**, it may be noted that the facilities installed and commissioned at the Project site comprise of the following facilities.

1) Indoor Facilities

i) Factory Building on Plot A of Lot 225111:

- Storage area for raw materials (plastic wastes, decanter sludge and POME sludge).
- Storage area for finished goods (refined oil and carbon black).
- Office area for administration purpose.
- Toilets.
- Equipment and machineries such as pyrolysis reactor, wire stripper and crusher for refined oil manufacturing.
- Flaring chamber (APCS 1).
- Wet scrubber (APCS 2).

2) Outdoor Facilities

- i) Internal road and car park.
- ii) Drainage system.
- iii) Septic tank for sanitation.
- iv) Water storage tank.
- v) Material loading and unloading area.
- vi) Storage areas for rubber tire wastes and steel wires.
- vii) Solid waste skip.
- viii) Fire hydrant system.
- ix) Guard house.

Table 5.3: Storage Capacity of Raw Materials and Finished Goods

Storage Area	Actual Storage Capacity (m²)	Storage Capacity After Stacking (MT)
A) Raw Materials		
Rubber Tire Wastes	120.96	241.92
Plastic Wastes	120.96	241.92
Decanter Sludge	34.56	69.12
POME Sludge	17.28	34.56
Total	293.76	587.52
B) Finished Products		
Refined Oil	87.10	174.20
Carbon Black	43.20	86.40
Steel Wires	23.04	46.08
Total	153.30	306.68

5.3.2 Process Description

The refined oil manufacturing process of this plant consists of:

- The physical processes including wire stripping, crushing, blending, pyrolysis, storing, drumming and packaging take place on Plot A of Lot 225111 to produce refined oil, carbon black and steel wires. The products will be sent to buyers.

Refined Oil Manufacturing from Rubber Tire Wastes

- Incoming rubber tire wastes will be screened against the established waste acceptance criteria (WAC). If fail to meet the requirements, the incoming wastes will be rejected from entering the plant for unloading.
- Steel wires will be stripped off from the tire wastes using a wire stripper machine. The wires will be stored in a designated storage area. Later, it will be packaged and sold to recycling facilities.
- The rubber tires will be sent for crushing to form rubber crumbs.
- The rubber crumbs will be loaded into the pyrolysis reactor as feedstock to begin the pyrolysis process.

- (v) The reactor is gradually heated to a target temperature in the range of 350 °C to 500 °C. The heat causes the rubber crumbs to break down into smaller molecules. During this phase, it is crucial to maintain an oxygen-free environment to prevent combustion.
- (vi) As the temperature rises, the rubber crumbs break down into various products. At lower temperatures, the primary product is oil whereas at higher temperatures, gases and carbon black are produced.
- (vii) The vapors produced in the pyrolysis phase are passed through a cooling system, where they condense into pyrolysis oil (refined oil).
- (viii) The refined oil is collected in storage tanks. The non-condensable gas (flue gas) is removed via APCS. Carbon black is collected from the reactor at the end of the process.
- (ix) After the process is complete and the pyrolysis reactor has cooled down, the carbon black is removed. The reactor is cleaned to prepare for the next batch of feedstock.
- (x) The refined oil and carbon black are subjected to quality control and analysis to ensure that they meet the required specifications.
- (xi) The refined oil that is stored in storage tanks will be filled into drums before being sold to buyers.
- (xii) The carbon black will be packaged before being sold to buyers.
- (xiii) During the pyrolysis process, air will be sucked out from the pyrolysis reactor and piped into the wet scrubber (APCS 2) to filter and purify the flue gas before channeling out via a chimney.
- (xiv) During the condensation process, air will be sucked out from the main condenser and piped into the flaring chamber (APCS 1) to flare off the syngas produced before channeling the remaining flue gas constituents into the wet scrubber (APCS 2) to be filtered and purified before channeling out via a chimney.

Refined Oil Manufacturing from Plastic Wastes

- (i) Incoming plastic wastes will be screened against the established waste acceptance criteria (WAC). If fail to meet the requirements, the incoming wastes will be rejected from entering the plant for unloading.
- (ii) The plastic wastes will be loaded into the pyrolysis reactor as feedstock to begin the pyrolysis process.
- (iii) The reactor is gradually heated to a target temperature in the range of 350 °C to 500 °C. The heat causes the rubber crumbs to break down into smaller molecules. During this

- phase, it is crucial to maintain an oxygen-free environment to prevent combustion.
- (iv) As the temperature rises, the rubber crumbs break down into various products. At lower temperatures, the primary product is oil whereas at higher temperatures, gases and carbon black are produced.
 - (v) The vapors produced in the pyrolysis phase are passed through a cooling system, where they condense into pyrolysis oil (refined oil).
 - (vi) The refined oil is collected in storage tanks. The non-condensable gas (flue gas) is removed via APCS. Carbon black is collected from the reactor at the end of the process.
 - (vii) After the process is complete and the pyrolysis reactor has cooled down, the carbon black is removed. The reactor is cleaned to prepare for the next batch of feedstock.
 - (viii) The refined oil and carbon black are subjected to quality control and analysis to ensure that they meet the required specifications.
 - (ix) The refined oil that is stored in storage tanks will be filled into drums before being sold to buyers.
 - (x) The carbon black will be packaged before being sold to buyers.
 - (xi) During the pyrolysis process, air will be sucked out from the pyrolysis reactor and piped into the wet scrubber (APCS 2) to filter and purify the flue gas before channeling out via a chimney.
 - (xii) During the condensation process, air will be sucked out from the main condenser and piped into the flaring chamber (APCS 1) to flare off the syngas produced before channeling the remaining gas constituents into the wet scrubber (APCS 2) to be filtered and purified before channeling out via a chimney.

Refined Oil Manufacturing from Decanter Sludge

- (i) Incoming decanter sludge will be screened against the established waste acceptance criteria (WAC). If fail to meet the requirements, the incoming wastes will be rejected from entering the plant for unloading.
- (ii) The sludge will be blended to prepare it as a feedstock for the pyrolysis reactor.
- (iii) Then, the sludge will be loaded into the pyrolysis reactor to begin the pyrolysis process.
- (iv) The reactor is gradually heated to a target temperature in the range of 350 °C to 500 °C. The heat causes the rubber crumbs to break down into smaller molecules. During this phase, it is crucial to maintain an oxygen-free environment to prevent combustion.

- (v) As the temperature rises, the rubber crumbs break down into various products. At lower temperatures, the primary product is oil whereas at higher temperatures, gases and carbon black are produced.
- (vi) The vapors produced in the pyrolysis phase are passed through a cooling system, where they condense into pyrolysis oil (refined oil).
- (vii) The refined oil is collected in storage tanks. The non-condensable gas (flue gas) is removed via APCS. Carbon black is collected from the reactor at the end of the process.
- (viii) After the process is complete and the pyrolysis reactor has cooled down, the carbon black is removed. The reactor is cleaned to prepare for the next batch of feedstock.
- (ix) The refined oil and carbon black are subjected to quality control and analysis to ensure that they meet the required specifications.
- (x) The refined oil that is stored in storage tanks will be filled into drums before being sold to buyers.
- (xi) The carbon black will be packaged before being sold to buyers.
- (xii) During the pyrolysis process, air will be sucked out from the pyrolysis reactor and piped into the wet scrubber (APCS 2) to filter and purify the flue gas before channeling out via a chimney.
- (xiii) During the condensation process, air will be sucked out from the main condenser and piped into the flaring chamber (APCS 1) to flare off the syngas produced before channeling the remaining flue gas constituents into the wet scrubber (APCS 2) to be filtered and purified before channeling out via a chimney.

Refined Oil Manufacturing from POME Sludge

- (i) Incoming POME sludge will be screened against the established waste acceptance criteria (WAC). If fail to meet the requirements, the incoming wastes will be rejected from entering the plant for unloading.
- (ii) The sludge will be blended to prepare it as a feedstock for the pyrolysis reactor.
- (iii) Then, the sludge will be loaded into the pyrolysis reactor to begin the pyrolysis process.
- (iv) The reactor is gradually heated to a target temperature in the range of 350 °C to 500 °C. The heat causes the rubber crumbs to break down into smaller molecules. During this phase, it is crucial to maintain an oxygen-free environment to prevent combustion.

- (v) As the temperature rises, the rubber crumbs break down into various products. At lower temperatures, the primary product is oil whereas at higher temperatures, gases and carbon black are produced.
- (vi) The vapors produced in the pyrolysis phase are passed through a cooling system, where they condense into pyrolysis oil (refined oil).
- (vii) The refined oil is collected in storage tanks. The non-condensable gas (flue gas) is removed via APCS. Carbon black is collected from the reactor at the end of the process.
- (viii) After the process is complete and the pyrolysis reactor has cooled down, the carbon black is removed. The reactor is cleaned to prepare for the next batch of feedstock.
- (ix) The refined oil and carbon black are subjected to quality control and analysis to ensure that they meet the required specifications.
- (x) The refined oil that is stored in storage tanks will be filled into drums before being sold to buyers.
- (xi) The carbon black will be packaged before being sold to buyers.
- (xii) During the pyrolysis process, air will be sucked out from the pyrolysis reactor and piped into the wet scrubber (APCS 2) to filter and purify the flue gas before channeling out via a chimney.
- (xiii) During the condensation process, air will be sucked out from the main condenser and piped into the flaring chamber (APCS 1) to flare off the syngas produced before channeling the remaining flue gas constituents into the wet scrubber (APCS 2) to be filtered and purified before channeling out via a chimney.

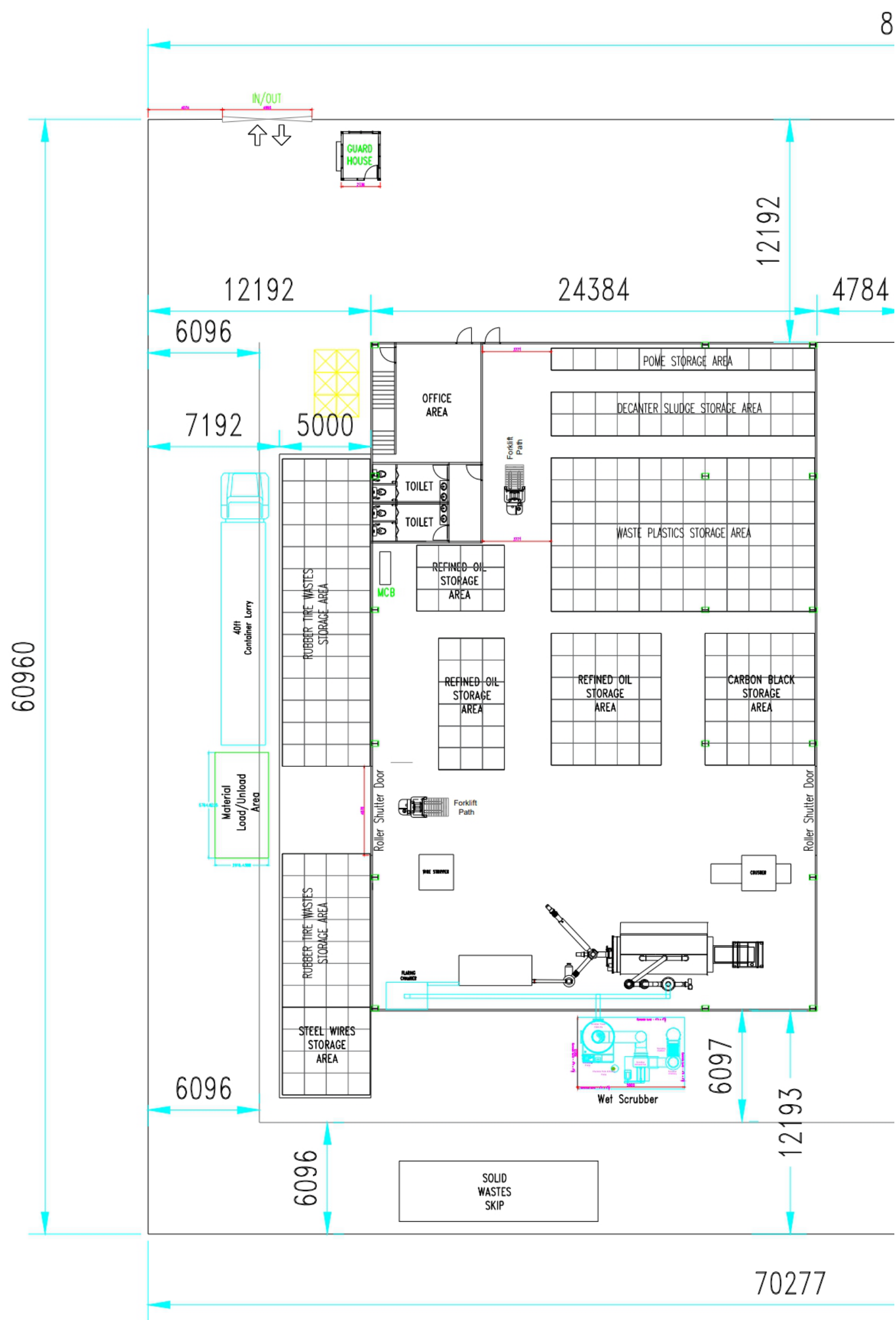


Figure 5.2: Plant Layout for Plot A of Lot 225111

5.4 RESOURCES

5.4.1 Incoming Material

Typical incoming raw materials which will be received, stored, and processed in this plant are as shown below:



Plate 1: Rubber Tire Wastes



Plate 2: Plastic Wastes



Plate 3: Decanter Sludge



Plate 4: POME Sludge

5.4.2 Finished Goods

Typical outgoing finished materials which will be produced by this plant are depicted below:



Plate 5: Refined Oil (Pyrolysis Oil)



Plate 6: Carbon Black



Plate 7: Steel Wires

5.4.3 Waste Material

Flue gas generated from the oil manufacturing process shall be treated using APCS before channeling out via chimney. Other solid wastes generated during the manufacturing activity should be properly disposed of at the solid waste skip. Any scheduled wastes generated should to send to Kualiti Alam (KA) or other approved site by DOE for safe disposal.

5.4.4 Operation Hours

The operation of the plant is in 2 shifts, 8 hours each shift with 2 hours of rest time in between, and 24 hours on daily operation. The waste acceptance hours are from 0800 to 1800 hours, from Monday to Friday.

The refined oil manufacturing from rubber tire wastes and plastic wastes shall be conducted by having a daily operational target of 4.00 metric tonnes whereas oil manufacturing from decanter sludge and POME sludge shall be conducted by having a daily operational target of 1.33 metric tonnes and 0.67 metric tonnes respectively, operating at an 8-hour duration in 1 shift, with a total of 2 shifts.

Manufacturing processes shall be operated over thirty (30) days per month. Hence, monthly capacity for rubber tire wastes and plastic wastes processes shall be $4.00 \times 30 = 120.00$ TPM whereas decanter sludge and POME sludge processes shall be $1.33 \times 30 = 40.00$ TPM, and $0.67 \times 30 = 20.00$ TPM respectively.

5.4.5 Manpower

The Project will be operated by trained personnel. Approximately 20 full time operators are required to manage the daily operations at the plant. There shall be 6 people in raw materials and finished goods handling. Moreover, 1 people will operate the APCS. Under administrative and managerial personnel, there will be 1 supervisor, 1 manager, 1 QA/QC personnel and 1 general manager.

5.4.6 Potential Sources

The source of the rubber tire wastes and related feedstocks shall be coming from local manufacturers and wastes recyclers or traders. These are local sources with active business trades in Perak and other neighbouring states.

5.4.7 Process Flow and Mass Balance

Overall process flow of the Project is as shown in **Figure 5.3**. Further details of the process shall be found in following section.

From **Figure 5.3**, the operation involves refined oil manufacturing by using physical methods such as wire stripping, crushing, blending, pyrolysis, condensation, storage and packaging. It may be noted that the recovery process lines have been designed, constructed and commissioned to suit operational requirements for the intended and expected incoming scheduled wastes and metal wastes as feedstock into the processing lines, including:

Solid Waste Sources

- 1) Rubber Tire Wastes (Local Source)
- 2) Plastic Wastes (Local Source)
- 3) Decanter Sludge (Local Source)
- 4) POME Sludge (Local Source)

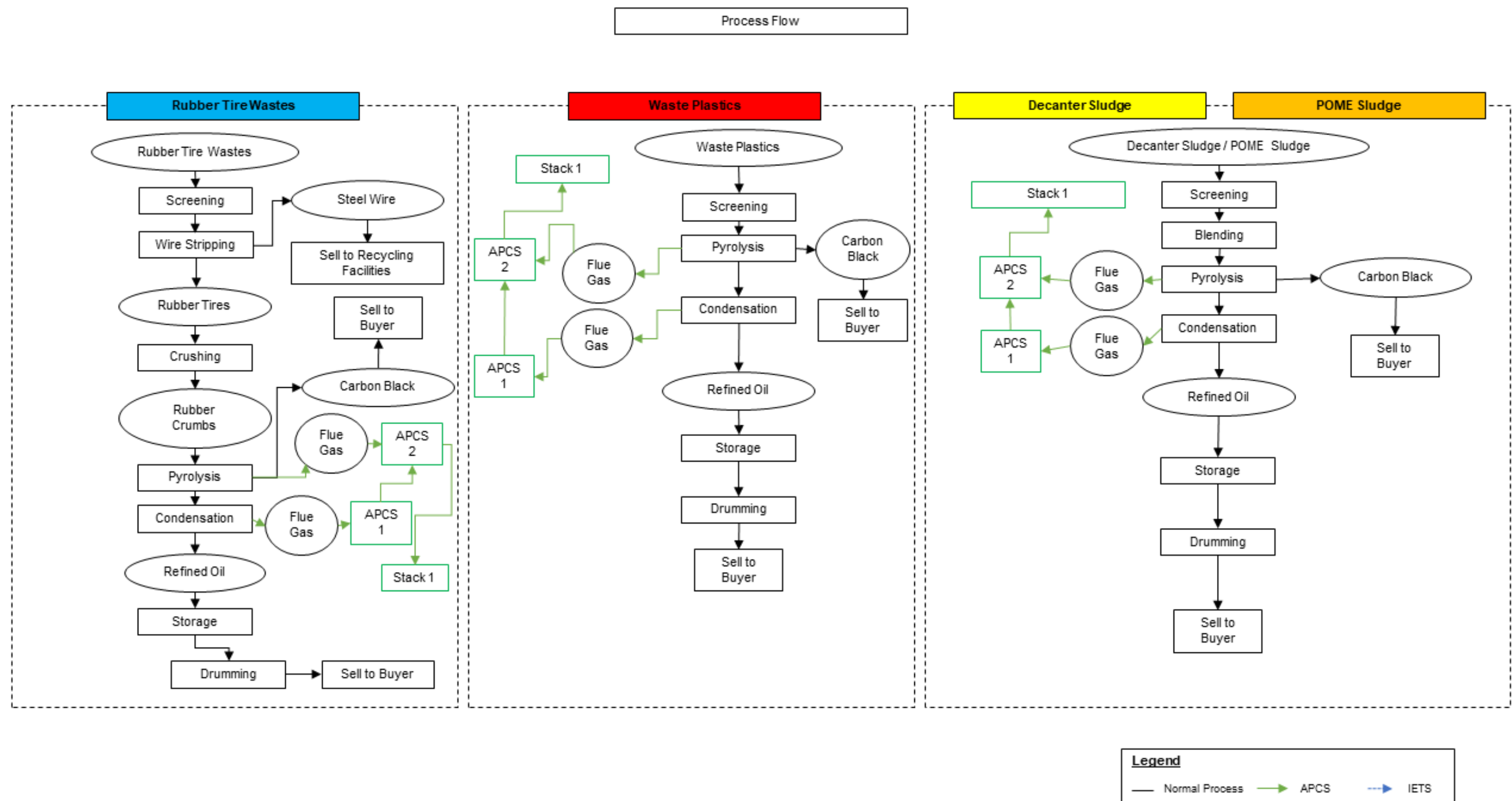


Figure 5.3: Process Flow Diagram

Technical descriptions of the refined oil manufacturing processes for some of the selected feedstocks are explained briefly in the followings:-

(a) Rubber Tire Wastes

The manufacturing process will involve the following stages:

- (i) Wire stripping of steel wires from rubber tire wastes.
- (ii) Crushing of rubber tires into rubber crumbs.
- (iii) Pyrolysis of rubber crumbs into refined oil (pyrolysis oil) and carbon black.

Figure 5.4 shows the process flow and mass balance of the refined oil manufacturing process from rubber tire wastes. An estimated 120.00 TPM of rubber tire wastes will be manufactured into 55.8 TPM of refined oil, 3.0 TPM of steel wires and 1.2 TPM carbon black.

Noise and air emission will be the potential impact from the manufacturing process. Steel wires will be sold off to recycling facilities whereas refined oil and carbon black will be sold off to buyers.

Summary of Refined Oil Manufacturing from Rubber Tire Wastes

- (i) Incoming rubber tire wastes will be screened against the established waste acceptance criteria (WAC). If fail to meet the requirements, the incoming wastes will be rejected from entering the plant for unloading.
- (ii) Steel wires will be stripped off from the tire wastes using a wire stripper machine. The wires will be stored in a designated storage area. Later, it will be packaged and sold to recycling facilities.
- (iii) The rubber tires will be sent for crushing to form rubber crumbs.
- (iv) The rubber crumbs will be loaded into the pyrolysis reactor as feedstock to begin the pyrolysis process.
- (v) The reactor is gradually heated to a target temperature in the range of 350 °C to 500 °C. The heat causes the rubber crumbs to break down into smaller molecules. During this phase, it is crucial to maintain an oxygen-free environment to prevent combustion.
- (vi) As the temperature rises, the rubber crumbs break down into various products. At lower temperatures, the primary product is oil whereas at higher temperatures, gases and carbon

black are produced.

- (vii) The vapors produced in the pyrolysis phase are passed through a cooling system, where they condense into pyrolysis oil (refined oil).
- (viii) The refined oil is collected in storage tanks. The non-condensable gas (flue gas) is removed via APCS. Carbon black is collected from the reactor at the end of the process.
- (ix) After the process is complete and the pyrolysis reactor has cooled down, the carbon black is removed. The reactor is cleaned to prepare for the next batch of feedstock.
- (x) The refined oil and carbon black are subjected to quality control and analysis to ensure that they meet the required specifications.
- (xi) The refined oil that is stored in storage tanks will be filled into drums before being sold to buyers.
- (xii) The carbon black will be packaged before being sold to buyers.
- (xiii) During the pyrolysis process, air will be sucked out from the pyrolysis reactor and piped into the wet scrubber (APCS 2) to filter and purify the flue gas before channeling out via a chimney.
- (xiv) During the condensation process, air will be sucked out from the main condenser and piped into the flaring chamber (APCS 1) to flare off the syngas produced before channeling the remaining flue gas constituents into the wet scrubber (APCS 2) to be filtered and purified before channeling out via a chimney.

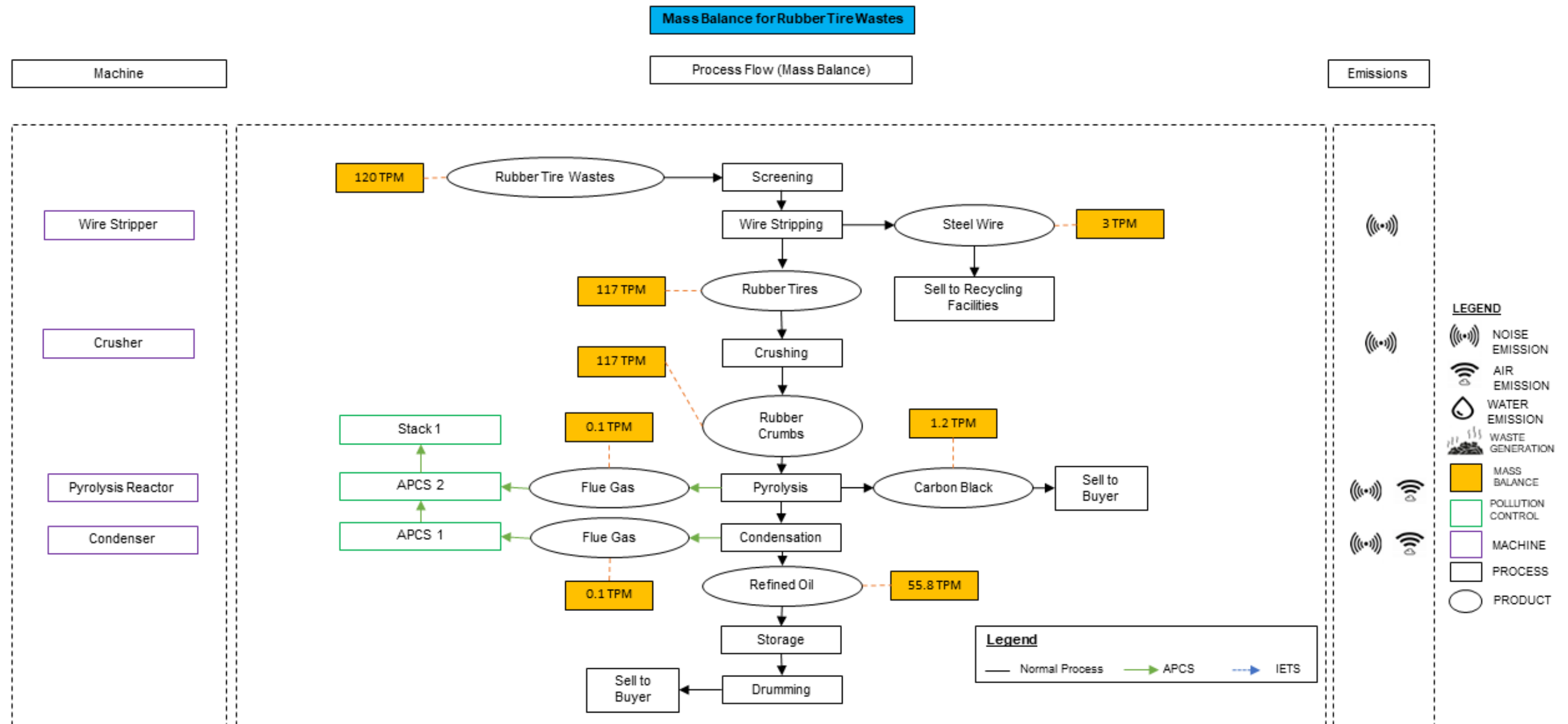


Figure 5.4: Process Flow and Mass Balance Diagram for Rubber Tire Wastes

(b) Plastic Wastes

The manufacturing process will involve the following stages:

- (i) Pyrolysis of plastic wastes into refined oil (pyrolysis oil) and carbon black.

Figure 5.5 shows the process flow and mass balance of the refined oil manufacturing process from rubber tire wastes. An estimated 120.00 TPM of plastic wastes will be manufactured into 74.5 TPM of refined oil and 0.5 TPM carbon black.

Noise and air emission will be the potential impact from the manufacturing process. Refined oil and carbon black will be sold off to buyers.

Summary of Refined Oil Manufacturing from Plastic Wastes

- (i) Incoming plastic wastes will be screened against the established waste acceptance criteria (WAC). If fail to meet the requirements, the incoming wastes will be rejected from entering the plant for unloading.
- (ii) The plastic wastes will be loaded into the pyrolysis reactor as feedstock to begin the pyrolysis process.
- (iii) The reactor is gradually heated to a target temperature in the range of 350 °C to 500 °C. The heat causes the rubber crumbs to break down into smaller molecules. During this phase, it is crucial to maintain an oxygen-free environment to prevent combustion.
- (iv) As the temperature rises, the rubber crumbs break down into various products. At lower temperatures, the primary product is oil whereas at higher temperatures, gases and carbon black are produced.
- (v) The vapors produced in the pyrolysis phase are passed through a cooling system, where they condense into pyrolysis oil (refined oil).
- (vi) The refined oil is collected in storage tanks. The non-condensable gas (flue gas) is removed via APCS. Carbon black is collected from the reactor at the end of the process.
- (vii) After the process is complete and the pyrolysis reactor has cooled down, the carbon black is removed. The reactor is cleaned to prepare for the next batch of feedstock.
- (viii) The refined oil and carbon black are subjected to quality control and analysis to ensure that they meet the required specifications.
- (ix) The refined oil that is stored in storage tanks will be filled into drums before being sold to buyers.
- (x) The carbon black will be packaged before being sold to buyers.
- (xi) During the pyrolysis process, air will be sucked out from the pyrolysis reactor and piped

into the wet scrubber (APCS 2) to filter and purify the flue gas before channeling out via a chimney.

- (xii) During the condensation process, air will be sucked out from the main condenser and piped into the flaring chamber (APCS 1) to flare off the syngas produced before channeling the remaining gas constituents into the wet scrubber (APCS 2) to be filtered and purified before channeling out via a chimney.

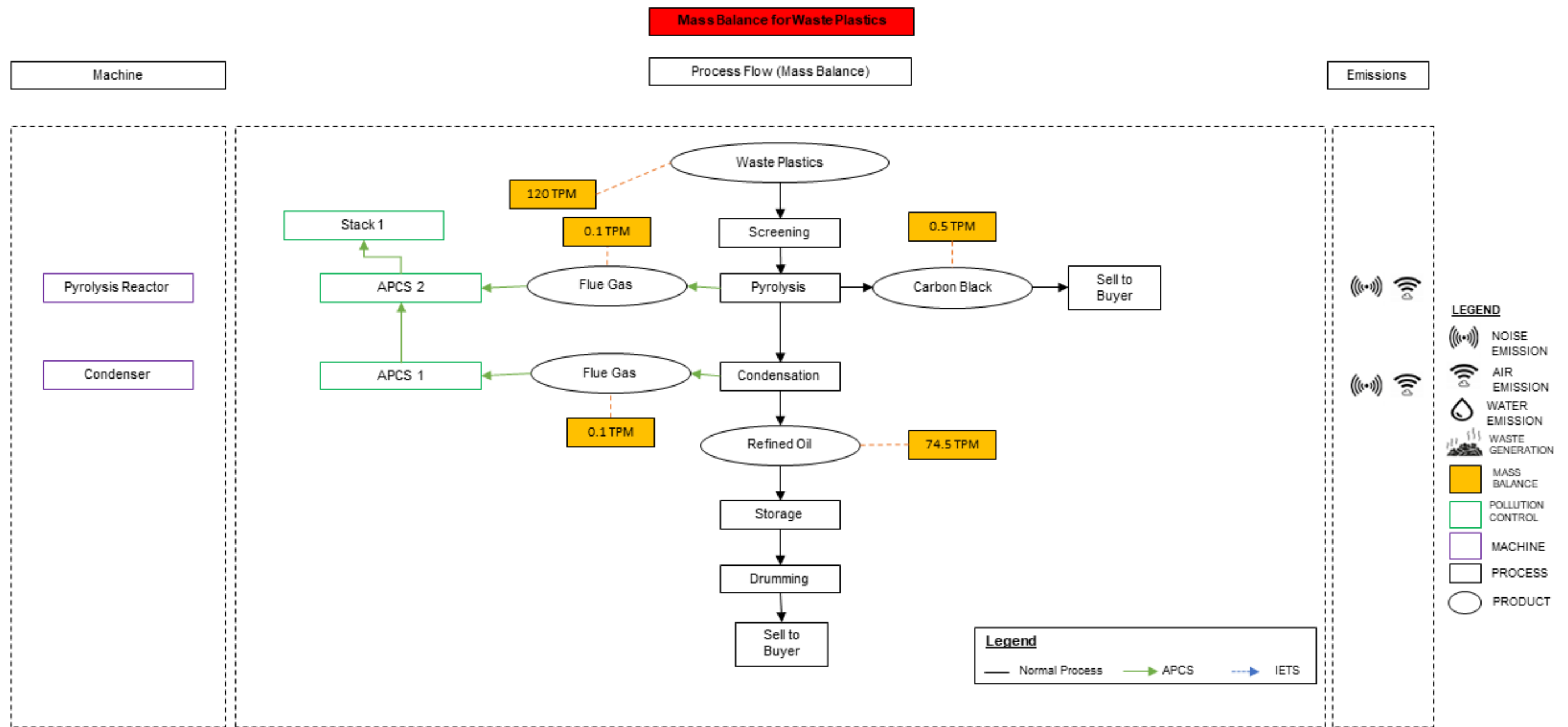


Figure 5.5: Process Flow and Mass Balance Diagram for Plastic Wastes

(c) Decanter Sludge

The manufacturing process will involve the following stages:

- (i) Blending of sludge as preparation of feedstock.
- (ii) Pyrolysis of decanter sludge into refined oil (pyrolysis oil) and carbon black.

Figure 5.6 shows the process flow and mass balance of the refined oil manufacturing process from decanter sludge. An estimated 40.00 TPM of plastic wastes will be manufactured into 11.8 TPM of refined oil and 0.2 TPM carbon black.

Noise and air emission will be the potential impact from the manufacturing process. Refined oil and carbon black will be sold off to buyers.

Summary of Refined Oil Manufacturing from Decanter Sludge

- (i) Incoming decanter sludge will be screened against the established waste acceptance criteria (WAC). If fail to meet the requirements, the incoming wastes will be rejected from entering the plant for unloading.
- (ii) The sludge will be blended to prepare it as a feedstock for the pyrolysis reactor.
- (iii) Then, the sludge will be loaded into the pyrolysis reactor to begin the pyrolysis process.
- (iv) The reactor is gradually heated to a target temperature in the range of 350 °C to 500 °C. The heat causes the rubber crumbs to break down into smaller molecules. During this phase, it is crucial to maintain an oxygen-free environment to prevent combustion.
- (v) As the temperature rises, the rubber crumbs break down into various products. At lower temperatures, the primary product is oil whereas at higher temperatures, gases and carbon black are produced.
- (vi) The vapors produced in the pyrolysis phase are passed through a cooling system, where they condense into pyrolysis oil (refined oil).
- (vii) The refined oil is collected in storage tanks. The non-condensable gas (flue gas) is removed via APCS. Carbon black is collected from the reactor at the end of the process.
- (viii) After the process is complete and the pyrolysis reactor has cooled down, the carbon black is removed. The reactor is cleaned to prepare for the next batch of feedstock.
- (ix) The refined oil and carbon black are subjected to quality control and analysis to ensure that they meet the required specifications.
- (x) The refined oil that is stored in storage tanks will be filled into drums before being sold to buyers.
- (xi) The carbon black will be packaged before being sold to buyers.

- (xii) During the pyrolysis process, air will be sucked out from the pyrolysis reactor and piped into the wet scrubber (APCS 2) to filter and purify the flue gas before channeling out via a chimney.
- (xiii) During the condensation process, air will be sucked out from the main condenser and piped into the flaring chamber (APCS 1) to flare off the syngas produced before channeling the remaining flue gas constituents into the wet scrubber (APCS 2) to be filtered and purified before channeling out via a chimney.

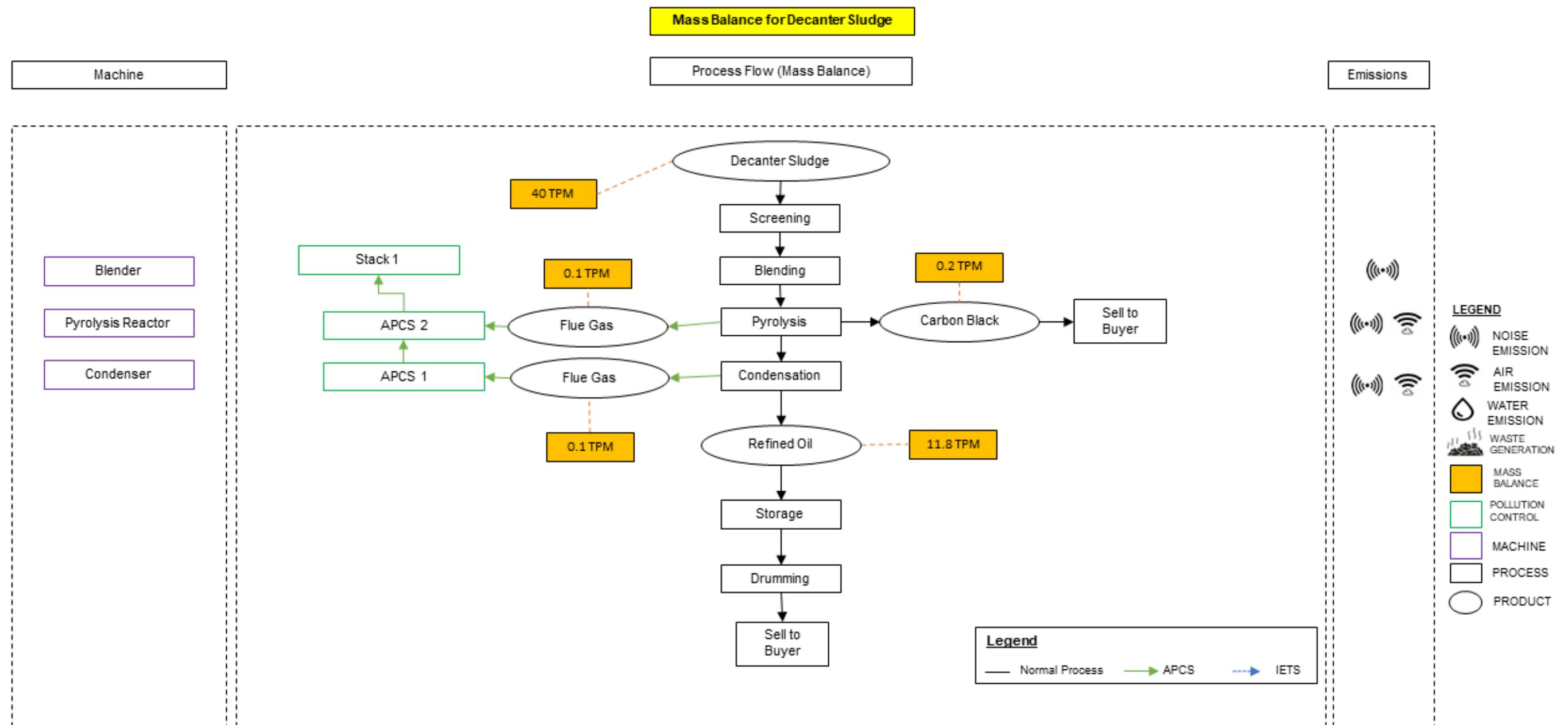


Figure 5.6: Process Flow and Mass Balance Diagram for Decanter Sludge

(d) POME Sludge

The manufacturing process will involve the following stages:

- (i) Blending of sludge as preparation of feedstock.
- (ii) Pyrolysis of POME sludge into refined oil (pyrolysis oil) and carbon black.

Figure 5.7 shows the process flow and mass balance of the refined oil manufacturing process from POME sludge. An estimated 20.00 TPM of plastic wastes will be manufactured into 5.9 TPM of refined oil and 0.1 TPM carbon black.

Noise and air emission will be the potential impact from the manufacturing process. Refined oil and carbon black will be sold off to buyers.

Summary of Refined Oil Manufacturing from POME Sludge

- (i) Incoming POME sludge will be screened against the established waste acceptance criteria (WAC). If fail to meet the requirements, the incoming wastes will be rejected from entering the plant for unloading.
- (ii) The sludge will be blended to prepare it as a feedstock for the pyrolysis reactor.
- (iii) Then, the sludge will be loaded into the pyrolysis reactor to begin the pyrolysis process.
- (iv) The reactor is gradually heated to a target temperature in the range of 350 °C to 500 °C. The heat causes the rubber crumbs to break down into smaller molecules. During this phase, it is crucial to maintain an oxygen-free environment to prevent combustion.
- (v) As the temperature rises, the rubber crumbs break down into various products. At lower temperatures, the primary product is oil whereas at higher temperatures, gases and carbon black are produced.
- (vi) The vapors produced in the pyrolysis phase are passed through a cooling system, where they condense into pyrolysis oil (refined oil).
- (vii) The refined oil is collected in storage tanks. The non-condensable gas (flue gas) is removed via APCS. Carbon black is collected from the reactor at the end of the process.
- (viii) After the process is complete and the pyrolysis reactor has cooled down, the carbon black is removed. The reactor is cleaned to prepare for the next batch of feedstock.
- (ix) The refined oil and carbon black are subjected to quality control and analysis to ensure that they meet the required specifications.
- (x) The refined oil that is stored in storage tanks will be filled into drums before being sold to buyers.
- (xi) The carbon black will be packaged before being sold to buyers.

- (xii) During the pyrolysis process, air will be sucked out from the pyrolysis reactor and piped into the wet scrubber (APCS 2) to filter and purify the flue gas before channeling out via a chimney.
- (xiii) During the condensation process, air will be sucked out from the main condenser and piped into the flaring chamber (APCS 1) to flare off the syngas produced before channeling the remaining flue gas constituents into the wet scrubber (APCS 2) to be filtered and purified before channeling out via a chimney.

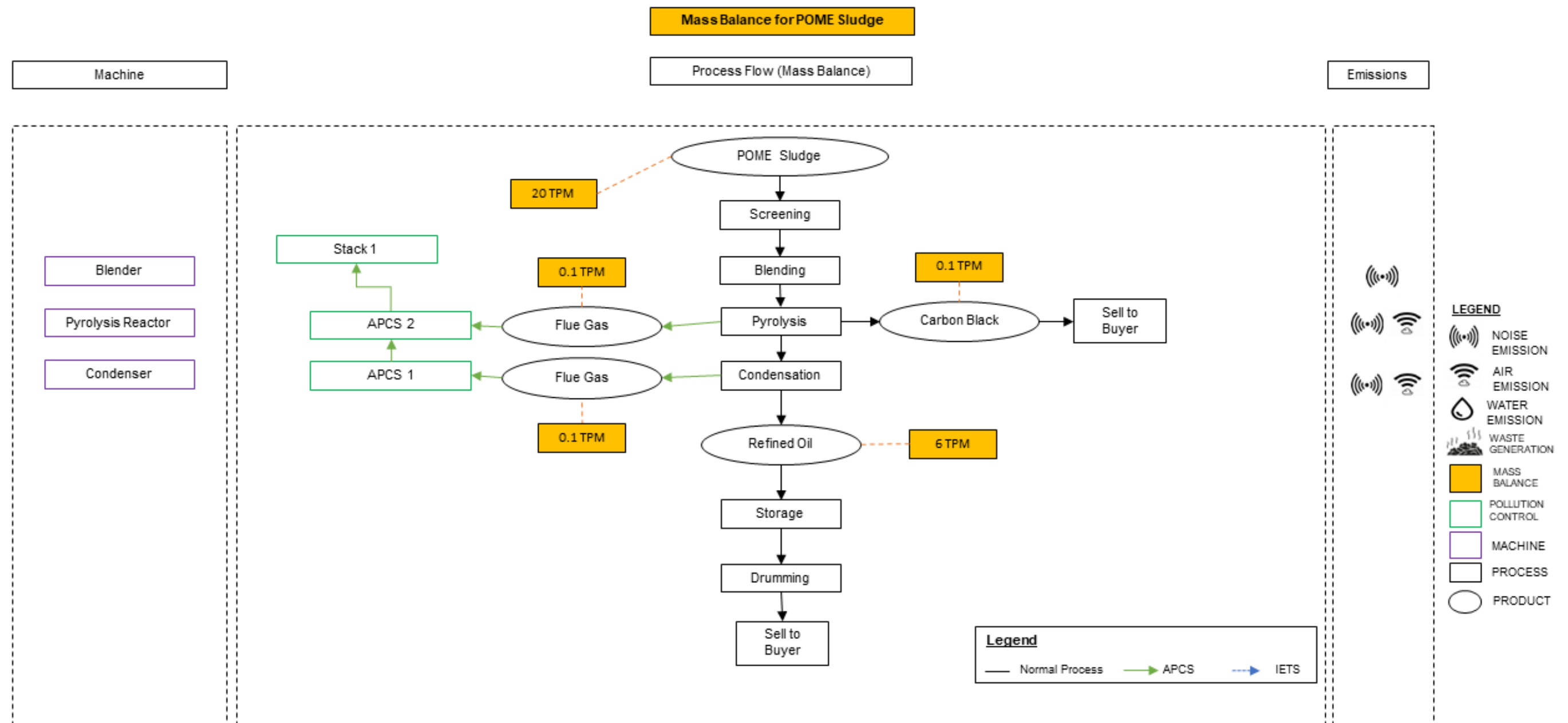


Figure 5.7: Process Flow and Mass Balance Diagram for POME Sludge

5.5 MASS BALANCE

Mass balance for material flow is computed based on tonnes per month (TPM) and depicted in **Table 5.4** to **Table 5.6**. It may be noted that the monthly expected tonnage of feedstock input shall be 300 TPM, with combination of raw materials of rubber tire wastes, plastic wastes, decanter sludge and POME sludge as tabulated below.

Table 5.4: Mass Balance for Raw Materials Received

Type of Waste Received	Waste Code	Description	Maximum Design Storage Capacity (m ²)	Maximum Monthly Storage Capacity (TPM)
Rubber Tire Wastes	-	Rubber content between 41% to 48%	120.96	241.92
Plastic Wastes	-	All types of plastics except halogen-containing plastics and PVC plastics	120.96	241.92
Decanter Sludge	-	Decanter cake with less than 70% moisture or which is dewatered	34.56	69.12
POME Sludge	-	Sludge cake with less than 70% moisture or which is dewatered	17.28	34.56
Total			293.76	587.52

Table 5.5: Mass Balance for Recovery Forms

Recovery Form	Waste Code	Maximum Capacity per Day in Metric Tonnes	Operation Capacity per Month in Metric Tonnes	Products
Refined Oil	-	87.10	174.20	Refined pyrolysis oil
Carbon Black	-	43.20	86.40	Carbon black powder
Steel Wire	-	23.04	46.08	Steel wires
Total		153.30	306.68	-

During the recovery process from the full operation of the plant, the sellable goods from the production shall include the end products as tabulated below.

Table 5.6: Quantity of Sellable Goods

No.	End Products	Quantity (TPM)
1.	Refined Oil	148.0
2.	Carbon Black	2.0
3.	Steel Wires	3.0
Total		153.0

Apart from that, the emission from the overall recovery process have been identified, quantified, and tabulated as below.

Table 5.7: Emissions From the Recovery Process

No.	Emissions	Quantity (TPM)	Treatment
1.	Flue Gas	0.80	APCS

There shall be a small quantity of rejects, estimated at 0.1%, or about 0.2 TPM, after the visual and manual screening exercise for incoming raw materials not suitable to be utilized as feedstock for the manufacturing in the Project facilities, due to any or a combination of the following reasons:-

- 1) Raw materials do not contain sufficient percentage of metal contents for effective recovery.
- 2) Raw materials are not acceptable for processing due to contamination from non-combustible materials.
- 3) Raw materials are not fully homogenous and in mixed form, and difficult to separate into various feedstock types.

It is expected the rejects shall comprise of recyclables and non-recyclables and shall be disposed of in a responsible and environmentally acceptable manner.

5.6 RAW MATERIALS, FINISHED PRODUCTS AND REJECTS

Table 5.8 to **Table 5.10** summarized the estimated quantities of raw materials input, types of end product and the estimated quantities from the recovery processing activities, and rejects expected to be generated.

Table 5.8: Raw Materials and their Sources

No.	Raw Material	Source	Quantity (TPM)
1.	Rubber Tire Wastes	Local	120.00
2.	Plastic Wastes	Local	120.00
3.	Decanter Sludge	Local	40.00
4.	POME Sludge	Local	20.00
Total Raw Materials			300.00

Table 5.9: End Products and their Potential Market

No.	End Products	Potential Market	Quantity (TPM)
1.	Refined Oil	Local & Overseas	148.0
2.	Carbon Black	Local & Overseas	2.0
3.	Steel Wires	Local & Overseas	3.0
Total End Products			153.0

Table 5.10: Estimated Rejects (Residual Wastes) Generated

No.	Rejects (Residual Wastes)	Disposal	Quantity (TPM)
1.	Flue Gas	Filtered and purified via APCS prior to channeling out through chimney	0.8
Total			0.8

5.7 POLLUTION CONTROL

The pollution control that is to be installed in the Project site involves a flaring chamber (APCS 1) and a wet scrubber (APCS 2).

5.7.1 Air Pollution Control System (APCS)

Air pollution control system (APCS) to be installed at the Project shall focus on particulates emissions and gaseous emissions generated from the condensation and pyrolysis process of wastes including rubber tire wastes, plastic wastes, decanter sludge and POME sludge. The particulates and gaseous emissions from the processes shall produce particulate matters which require to be filtered and settled, and gases such as SO₂, NO₂, CO, VOC and other gases which shall require to be purified. The APCS to be installed shall be detailed in the EIA report preparation. The proposed APCS shall include 2 main systems, as follows:-

Flaring Chamber (APCS 1)

Flaring chamber is the air pollution control system (APCS 1) which will be installed at the Project site. The focus of the APCS 1 is on the gaseous emissions from the condensation of pyrolysis vapours. The emission shall contain syngas and particulates which is required to be filtered and purified.

As air is collected from the main condenser, it passes through a ducting system into the flaring chamber, which houses the flaring mechanism. Then, the air passes through the mechanism to flare off particulates and syngas. The purified flue gas will then pass through another ducting system towards the wet scrubber (APCS 2) to be further purified before being released into the atmosphere via a chimney (Stack 1). The APCS system shall have four (4) operating components:

- 1) Ducting system
- 2) Cyclone
- 3) Flaring chamber
- 4) Flaring mechanism

Wet Scrubber (APCS 2)

Wet scrubber is the air pollution control system (APCS 2) which will be installed at the Project site. The focus of the APCS 2 is on the gaseous emissions from the pyrolysis of waste materials and flue gas from the flaring chamber. The emission shall contain gases and particulates which is required to be filtered and purified.

As air is collected from the pyrolysis reactor and flaring chamber, it passes through a ducting system into the scrubber. The air is then purified in the scrubber system before being released into the atmosphere via a chimney (Stack 1). The APCS system shall have six (6) operating components:

- 1) Ducting system
- 2) Scrubber tower
- 3) Circulation pump
- 4) Chemical tank and dosing pump
- 5) Exhaust fan
- 6) Chimney (Stack 1)

The typical arrangement (sketch) of the proposed APCS 2 is shown in **Figure 5.8**. The APCS 2 shall be operated by a competent person. The chemical components used in the scrubbing system shall be procured from reliable manufacturer with good industrial track record to remove dust particularly due to particulate matters from the air emission.

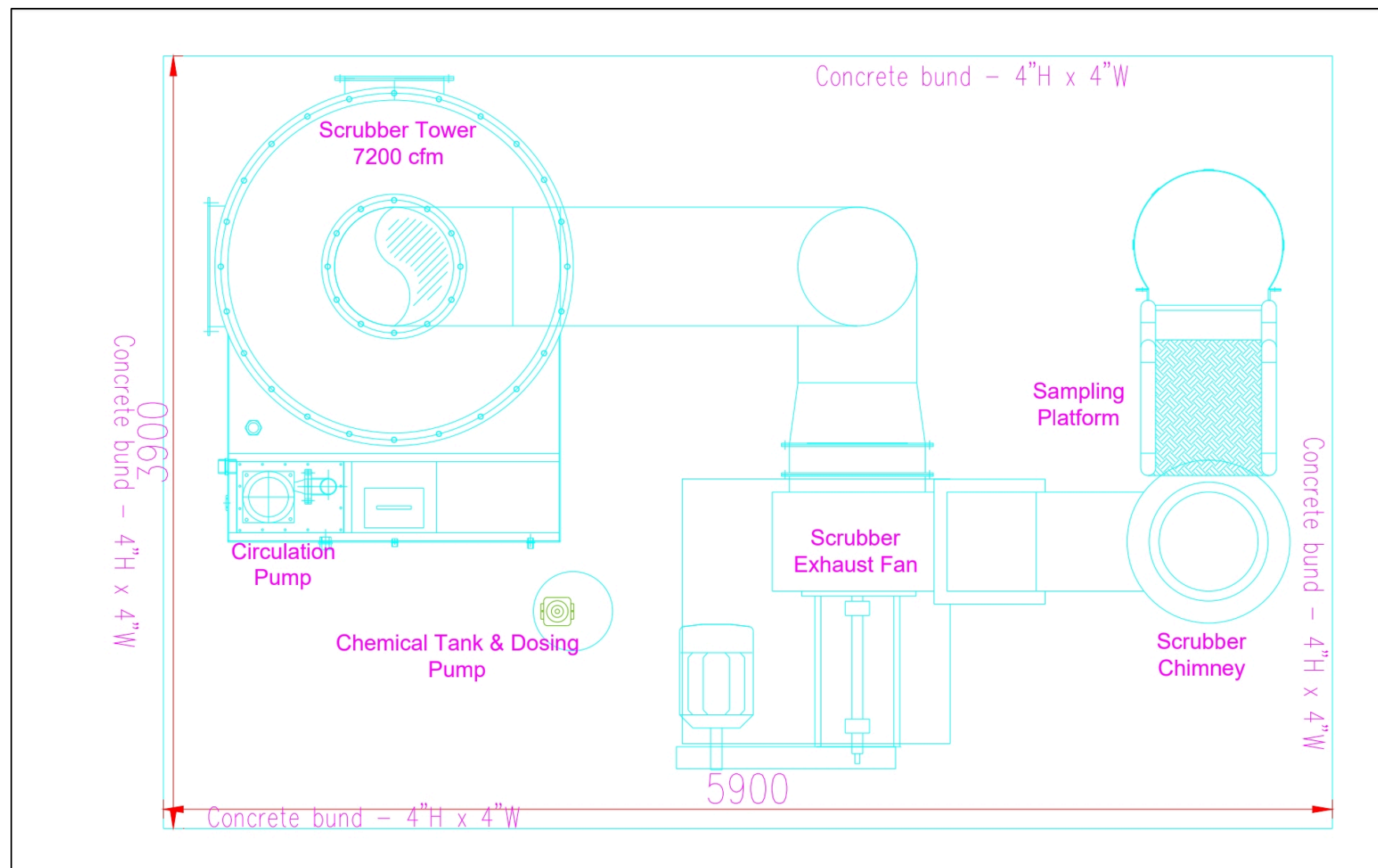


Figure 5.8: Typical Arrangement (Sketch) of Proposed Wet Scrubber (APCS 2)

5.8 MACHINERY USED IN THE PROCESSES

The list of equipment and machinery used for the manufacturing process at the Project site are tabulated in **Table 5.11**. The machines chosen and used for the manufacturing plant is according to the operational capacity of the manufacturing plant.

Table 5.11: Summary of Equipment Used for Manufacturing Process

No.	Equipment	Process	Capacity	Manufacturer
1.	Wire Stripper (1 Unit)	Stripping off steel wires from rubber tire wastes	0.17 tonnes per hour per unit	China
2.	Crusher (1 Unit)	Crushing rubber tires into rubber crumbs	0.16 tonnes per hour per unit	China
3.	Pyrolysis Reactor (1 Unit)	Pyrolysis of waste materials	0.41 tonnes per hour per unit	China
4.	Condenser (1 Unit)	Condensation of pyrolysis vapors	0.41 tonnes per hour per unit	China
5.	Blending Equipment (1 Unit)	Blending of decanter and POME sludge for feedstock preparation	0.08 tonnes per hour per unit	China
6.	Flaring Chamber, APCS 1 (1 Unit)	Flaring of syngas and particulates emitted from condenser	0.5 kg per hour per unit	China
7.	Wet Scrubber, APCS 2 (1 Unit)	Filtration and purification of flue gas emitted from pyrolysis reactor and flaring chamber	8.3333 m ³ /sec and 5.5556 m ³ /sec of volumetric flowrate	China

5.9 TRANSPORTATION

The Project Proponent will use trucks or transport vehicles that are registered with DOE Perak as means of transportation for collecting the incoming waste materials from local sources.

Based on 300 tonnes processing capacity per month, the number of trips generated per day is expected to be 3 – 4 trips by using 5 MT and 3 MT trucks, or 1 trip by using trailer trucks. They will use Government approved tarred roads for heavy vehicles. The route used will be planned to avoid dense residential areas. The transportation routes are mainly focused within Kawasan Perindustrian Tungzen.

Emergency Response Plan or ERP for transportation of rubber tire wastes and related feedstocks to and from Waste Generators' premise to Project site shall cover the following: road accident-vehicle breakdown-spillage of scheduled waste in transit. All drivers shall be regularly trained in ERP procedures and ERP drills at least once a year. The vehicles are equipped with emergency response equipment all the time such as:

- Portable spill kit which includes personal protection equipment, absorbent, disposal bags, etc.
- Fire extinguishers
- First aid kit
- Safety signage
- Seventh Schedule as required under EQ (SW) Regulation, 2005

5.10 UTILITIES

5.10.1 Water Supply

The water required for the Project is about 50.0 m³/day. This is mainly for replenishing of water used in sanitation and general washing.

5.10.2 Electricity Supply

Electricity supply is provided by Tenaga Nasional Berhad (TNB) via the national grid network. During the operational phase, it is estimated that the electricity load requirement for the whole Project is about 4,000 kWh/month. Electricity is widely used in the processes of pyrolysis, crushing, blending and wire stripping.

5.10.3 Waste Disposal

Residue waste which is deemed to be treated as scheduled waste shall be sent to DOE Prescribed Premises and collected by DOE licensed scheduled wastes contractor. The scheduled waste and off spec rejects produced from the process shall be handled in the method tabulated in **Table 5.12**.

Table 5.12: Residue Waste and Handling Method

SW Code	Residue Waste	Contractor Projected (MT/month or units/month)	Handling
-	Flue Gas	0.8	Filtration and purification via APCS

Sewage derived from the factory will be treated before being discharged into receiving water body. Septic tanks have been provided at the Project site. The sewage system shall cater for up to 30 Population Equivalent (PE). The estimated solid waste generated by each worker is 0.5 kg/day. It will be disposed of at a designated landfill by licensed contractor. Meanwhile, other scheduled wastes generated (used oils, used filters, etc.), which is deemed to be treated as scheduled wastes shall be sent to Kualiti Alam (KA) for final disposal.

5.10.4 Chemical Usage

Raw chemical materials will be purchased every month to be used in the manufacturing process. The type of chemical is shown in **Table 5.13**. They will be stored at the designated raw chemical storage area.

Table 5.13: Estimated Chemical Usage for the Project

No.	Process	Raw Materials	Quantity (TPM)
1	Wet Scrubber System	Sodium Hydroxide	0.20

5.11 PROJECT ASSESSMENT TIMELINE

The proposed target timeline for the whole assessment process is shown in **Table 5.14**.

Table 5.14: Timeline of Studies

Activity	Jan-2024				Feb-2024				Mar-2024				Apr-2024				May-2024				Status
	W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4	
Site Reconnaissance																					Completed
Baseline Sampling and Laboratory Analysis																					Completed
EIA Report Preparation																					Completed
Compilation of EIA Report																					Completed
Review of Draft EIA Report																					Completed
Submission of Final EIA Report to DOE																					Completed
DOE Review, Responses to DOE Comments & EIA Approval																					Pending

CHAPTER 6

EXISTING ENVIRONMENT

CHAPTER 6 : EXISTING ENVIRONMENT

6.1 INTRODUCTION

This Chapter contains the information on the existing environment of the Study Area. The Study Area covers a total of 5 km radius from the proposed Project site boundary. The existing environmental data presented in the following subsections are derived from both primary and secondary sources via specific field surveys and supplemented by the secondary data from relevant published sources. The component of the existing environmental sector study and respective study methods are summarized in **Table 6.1**.

The findings of the existing environment in this Chapter will be used to form the basis for evaluation of the extent of the Project's impact during development and implementation. This data will also be used to measure the change of environmental quality due to the Project activities.

Table 6.1: Existing Environmental Components Assessed

Category	Subject	Method	Coverage
Physical – Chemical Environment	Topography, Soil and Geology	Field survey	Project site
		Secondary source	Study area
	Hydrology & Drainage System	Secondary data and field verification	Study area
	Climate & Meteorology	Secondary source	Study area
	River Water Quality	Field sampling	Study area
	Ambient Air Quality		
	Noise Level		
	Groundwater Quality		
Biological Environment	Terrestrial Flora	Secondary source	Study area
	Terrestrial Fauna		
Human Environment (Socio-Economy)	Land Use	Field verification and secondary source	Study area
	Infrastructure & Utilities	Secondary source	Study area

6.2 PHYSICAL-CHEMICAL ENVIRONMENT

6.2.1 Topography, Hydrology, Soil, Geology, and Hydrogeology

The Project is located at Lot 22511, Jalan Gopeng, Kawasan Perindustrian Tungzen, Mukim Sungai Raya, 31300 Kampung Kepayang, Perak Darul Ridzuan. The coordinates of the center of the Project site are latitude 4°30'43.6"N and longitude 101° 8'55.8"E. The Project shall be operational at a new recovery facility by Lot 22511, Jalan Gopeng, Kawasan Perindustrian Tungzen, Mukim Sungai Raya, 31300 Kampung Kepayang, Perak Darul Ridzuan. This project is to be carried out on a lowland area with a total area of 4,698 m². The topographic map of the area is shown in **Figure 6.1**.

Kawasan Perindustrian Tungzen is well developed industrial park with an adequate system of monsoon drains. The surface runoff water from the Project site will discharge into the newly constructed external drain at the boundary of Project site and eventually into Sungai Raya. The natural river system in the area is shown in **Figure 6.2**.

The geological formation of the area is Quaternary Formation, which consists of marine and continental deposits with clay, silt, sand and peat with minor gravel as shown in **Figure 6.3**. There are no fault lines within or near the Project site. The soil in the Project site is Tanah Lombong (Mined Land) soil series as shown in **Figure 6.4**. The Project site also has very high generalized Aquifer Potential as shown in **Figure 6.5**.

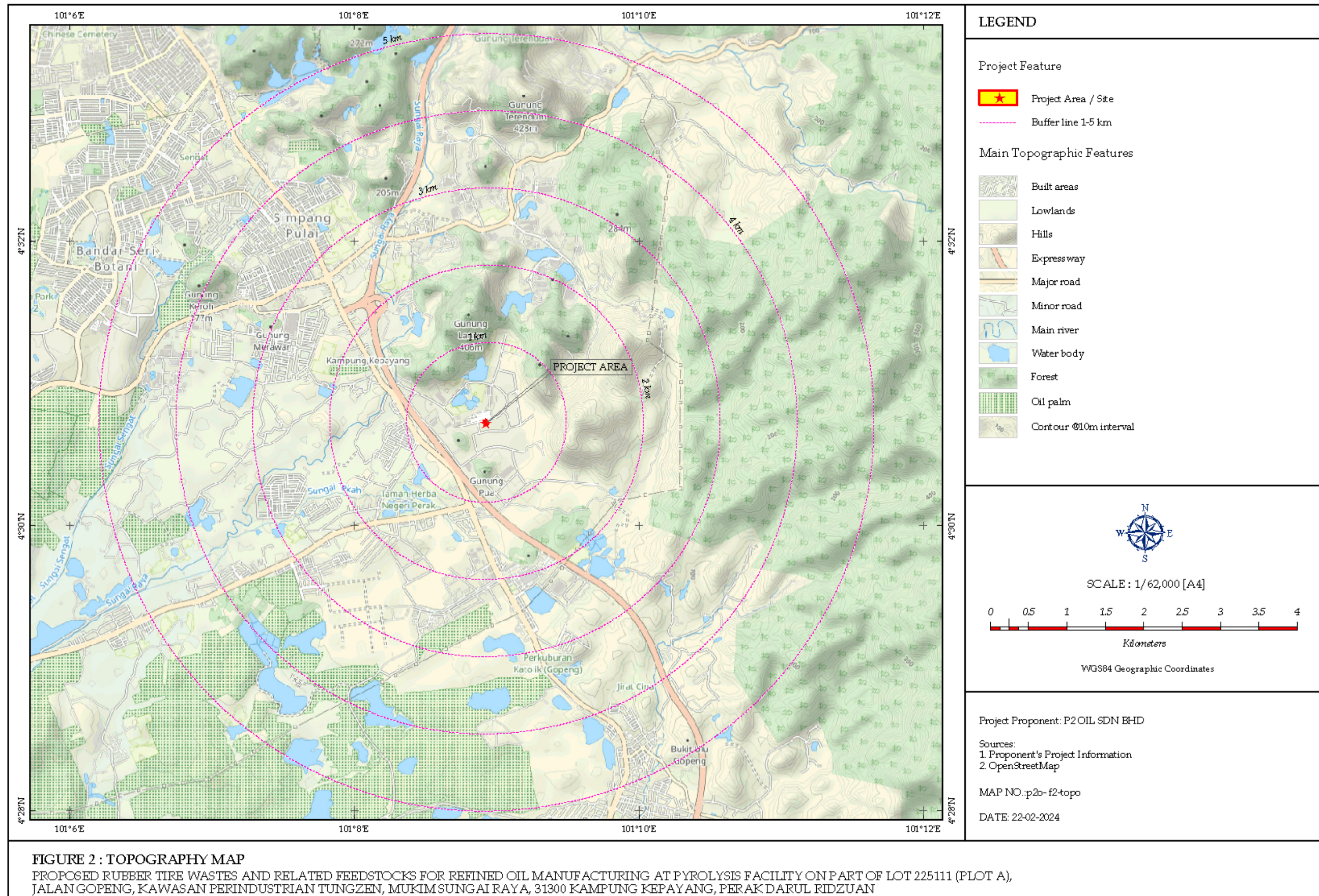


Figure 6.1: Topography Map

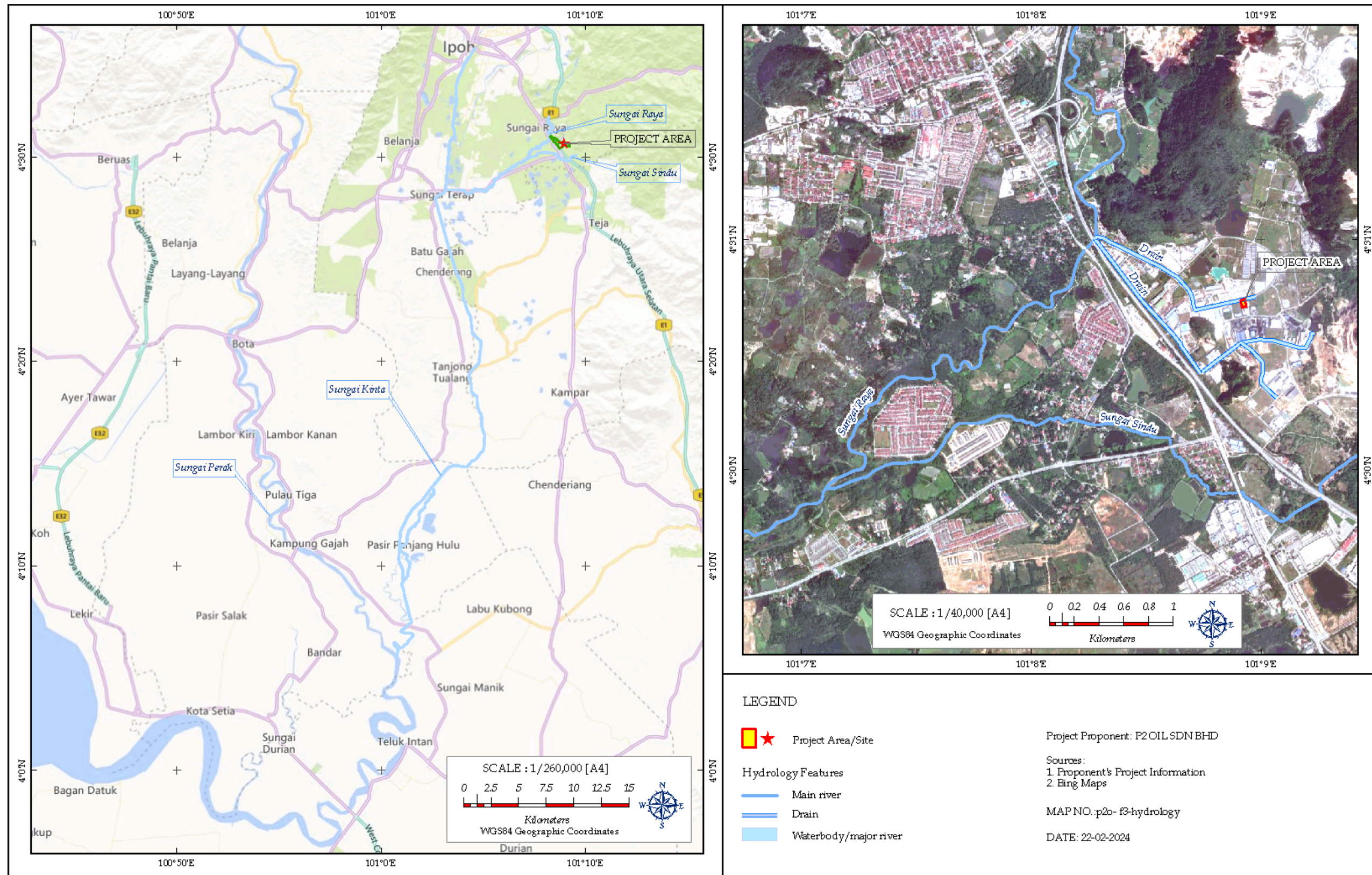


Figure 6.2: Hydrology Map

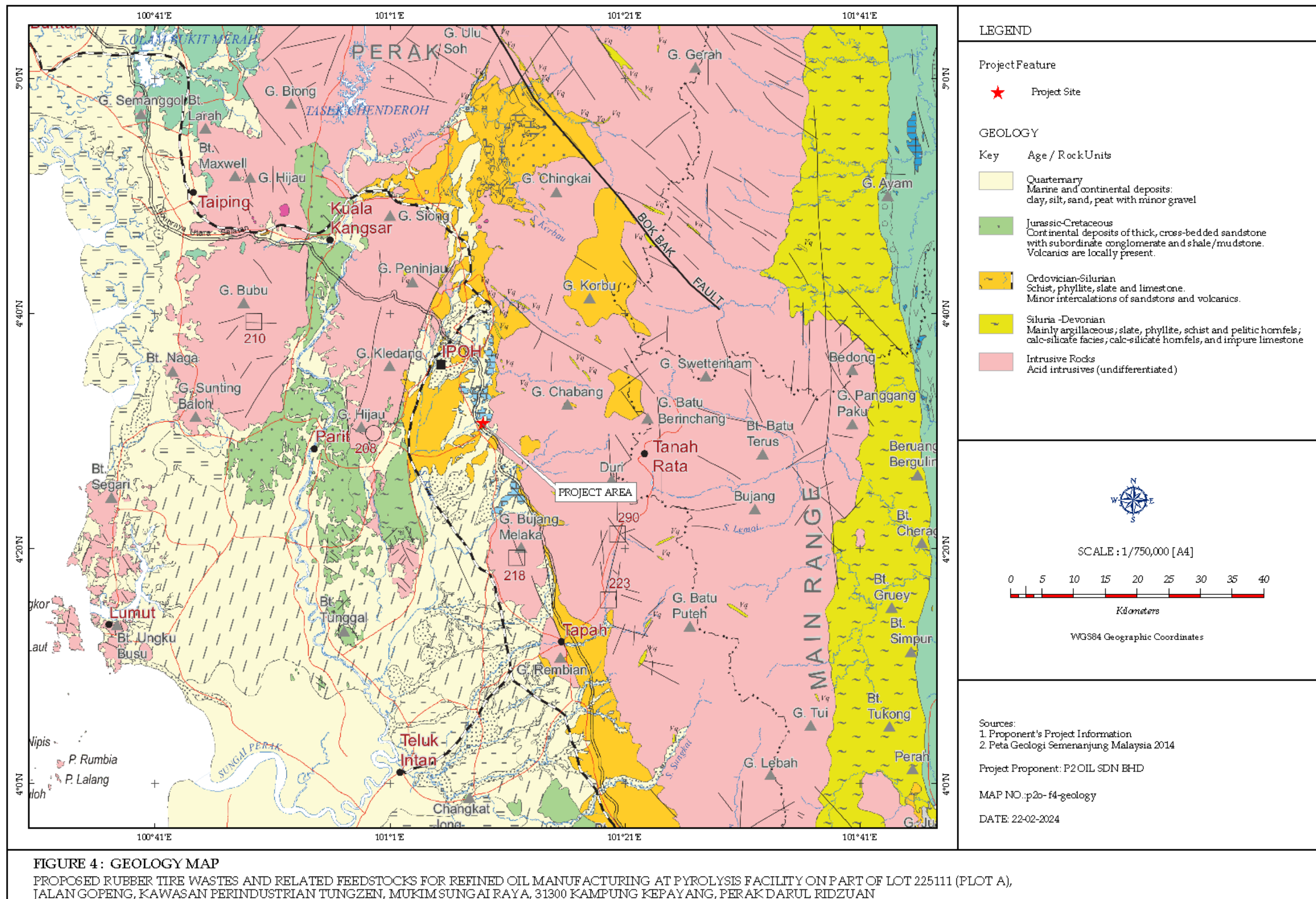


Figure 6.3: Geology Map

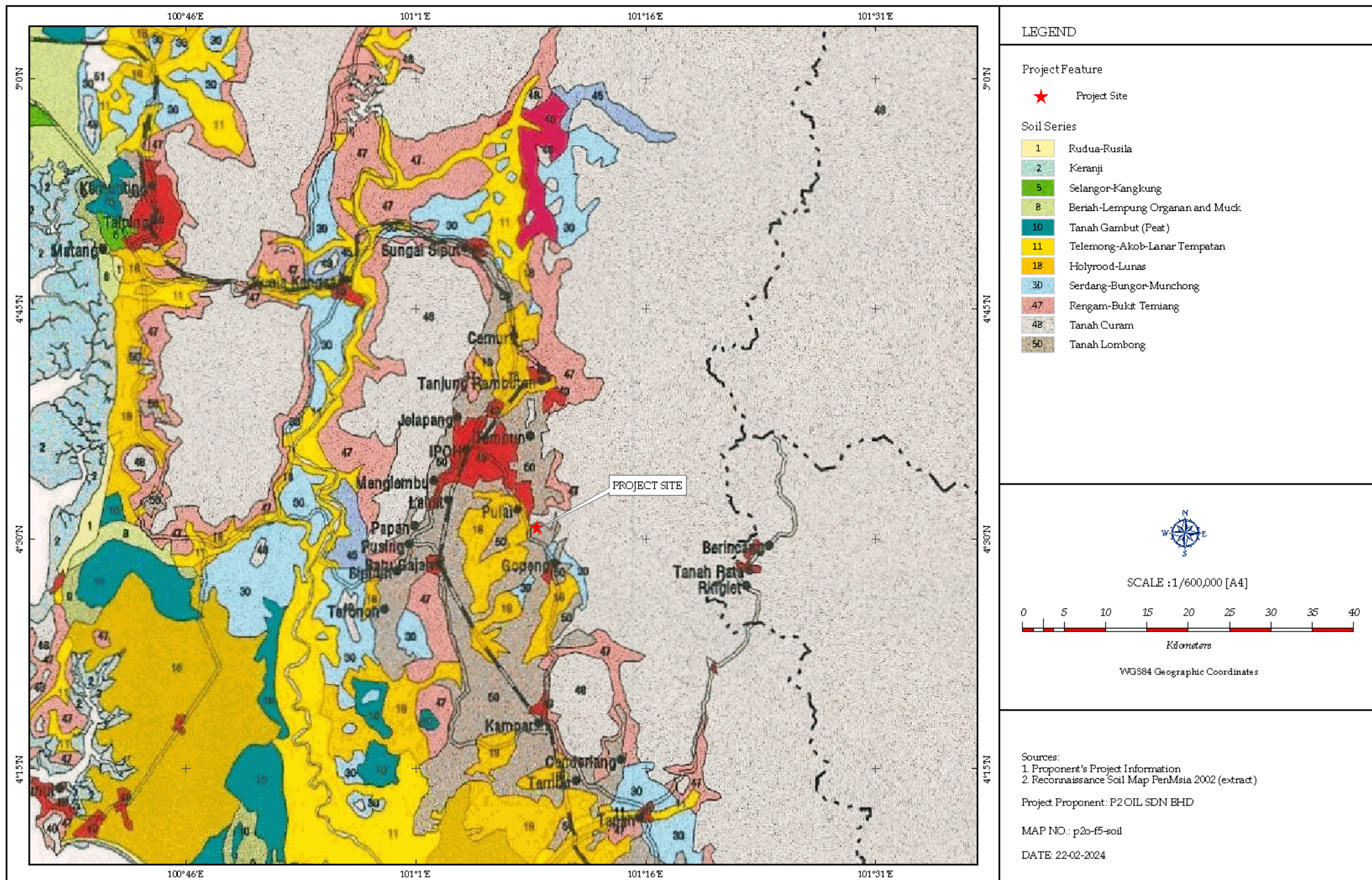


FIGURE 5: SOIL MAP

PROPOSED RUBBER TIRE WASTES AND RELATED FEEDSTOCKS FOR REFINED OIL MANUFACTURING AT PYROLYSIS FACILITY ON PART OF LOT 225111 (PLOT A),
JALAN GOPENG, KAWASAN PERINDUSTRIAN TUNGZEN, MUKIM SUNGAI RAYA, 31300 KAMPUNG KEPAYANG, PERAK DARUL RIDZUAN

Figure 6.4: Soil Map

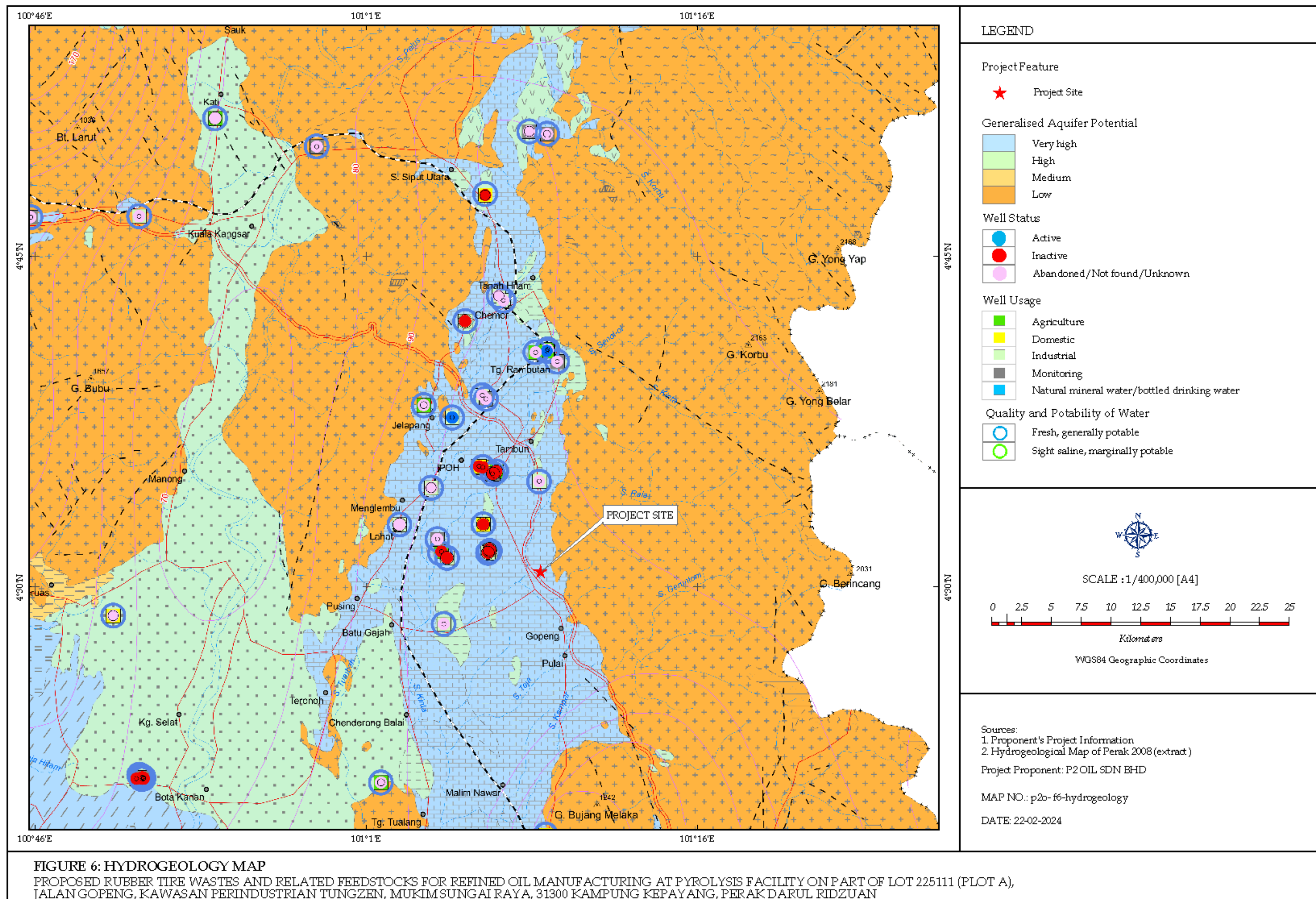


Figure 6.5: Hydrogeology Map

6.2.2 Water Quality

The river water quality sampling was conducted to assess the existing water quality near the Project site. Water quality samples are collected to judge attainment of water quality standards to observe water pollution. This section of the report will basically address the issue of water quality when the proposed Project is implemented.

Five (5) water samples were collected for analysis in 24 August 2023. The sampling locations and its coordinates are given in **Table 6.2**. **Figure 6.6** shows the water quality sampling locations.

Table 6.2: Water Quality Monitoring Stations

Location	Description	Coordinates	
		Latitude	Longitude
W1	Upstream (External Drain Before Project Site)	4°30'45.0"N	101°8'57.2"E
W2	Downstream (External Drain After Project Site)	4°30'44.3"N	101°8'54.3" E
W3	Downstream (Stormwater Drainage)	4°30'42.5"N	101°8'42.5"E
W4	Downstream (Stormwater Drainage)	4°31'01.0"N	101°8'17.4"E
W5	Downstream (Sungai Raya)	4°31'00.5"N	101°8'16.5"E

Methodology

Sample was kept in clean airtight bottles containing preservative (**Table 6.3**), kept cooled in an icebox and was sent to an accredited laboratory within 24 hours to analyze. Several parameters such as pH, temperature and dissolved oxygen (DO) were measured in-situ and other parameters were analyzed in an accredited laboratory [EnviChem Consults Sdn Bhd]. The result (Certificates of Analysis) is attached in **Appendix 6.1**.

Table 6.3: Preservation of Water Samplers for Analysis

Parameters	Preservatives
Oil & Grease	Sterilized glass bottles were used, and water samples were preserved with hydrochloric acid (2.5 ml 6N HCl).
Biochemical Oxygen Demand (BOD)	Water samples to be kept below 4°C.
Chemical Oxygen Demand (COD), Ammoniacal Nitrogen (AN)	Water samples were preserved with sulphuric acid (1.0 ml 9N H ₂ SO ₄).
<i>Escherichia coli</i> (E.coli)	Sterilized glass bottles were used, and water samples were preserved with sodium thiosulphate and samples kept in ice during transportation to the laboratory.

Results and Discussion

The results of the river water quality analysis as benchmarked against Class IIB of National Water Quality Standards for Malaysia (NWQS) and DOE Water Quality Index (WQI) are shown in **Table 6.4**. The laboratory report for water quality is attached in **Appendix 6.1**.

Based on the results tabulated in **Table 6.4**, all of the tested parameters except Dissolved Oxygen (DO) and Chemical Oxygen Demand (COD) for W3 as well as Biochemical Oxygen Demand (BOD) for all monitoring stations was found within the NWQS Class IIB limit. The water quality for all stations is classified as Slightly Polluted except W3 where it is Polluted, and under Class III according to DOE WQI.

Table 6.4: Baseline Water Quality for the Project Site

Parameter	Unit	W1	W2	W3	W4	W5	Class IIB Limit (NWQS)
Temperature	°C	29.6	29.6	29.7	29.7	29.7	-
pH	-	8.47	8.20	7.45	8.19	8.19	6.0 – 9.0
Dissolved Oxygen	mg/l	5.5	5.7	2.9	5.2	5.5	5 – 7
COD	mg/l	16	16	37	22	19	25
BOD* 5 days @ 20 °C	mg/l	8	7	15	10	9	3
TSS	mg/l	6	8	44	42	48	50
Turbidity	NTU	2.52	2.67	27.1	20.3	29.3	50
Mercury (Hg)	mg/l	ND(<0.0002)	ND(<0.0002)	ND(<0.0002)	ND(<0.0002)	ND(<0.0002)	0.001
Cadmium (Cd)	mg/l	ND(<0.002)	ND(<0.002)	ND(<0.002)	ND(<0.002)	ND(<0.002)	0.01
Chromium Hexavalent (Cr ⁶⁺)	mg/l	ND(<0.02)	ND(<0.02)	ND(<0.02)	ND(<0.02)	ND(<0.02)	0.05
Arsenic (As)	mg/l	0.03	0.04	0.03	0.03	0.03	0.05
Lead (Pb)	mg/l	ND(<0.01)	ND(<0.01)	0.04	0.02	0.01	0.05

Chromium Trivalent (Cr ³⁺)	mg/l	ND(<0.02)	ND(<0.02)	ND(<0.02)	ND(<0.02)	ND(<0.02)	-
Copper (Cu)	mg/l	ND(<0.01)	ND(<0.01)	ND(<0.01)	ND(<0.01)	ND(<0.01)	0.02
Manganese (Mn)	mg/l	0.07	0.06	0.06	0.05	0.08	0.1
Nickel (Ni)	mg/l	0.01	0.01	0.04	0.02	0.03	0.05
Tin (Sn)	mg/l	0.005	0.006	0.01	0.01	0.01	-
Zinc (Zn)	mg/l	ND(<0.01)	0.01	0.23	0.20	0.06	5
Iron (Fe)	mg/l	0.06	0.14	0.62	0.73	0.85	1
Ammoniacal Nitrogen	mg/l	ND(<0.01)	ND(<0.01)	ND(<0.01)	ND(<0.01)	ND(<0.01)	0.3
Oil & Grease	mg/l	ND(<0.01)	ND(<0.01)	ND(<0.01)	ND(<0.01)	ND(<0.01)	0.4; N
E-coli	CFU / 100 ml	8	11	20	9	14	-
WQI	-	66	67	56	61	61	51.9 - 76.5
Class	-	III	III	III	III	III	IIB
Classification	-	Slightly Polluted	Slightly Polluted	Polluted	Slightly Polluted	Slightly Polluted	Clean

Source: Field Sampling, EnviChem Consults Sdn Bhd, 2023

Note: Figure in **BOLD** indicates reading exceeded National Water Quality Standard for Malaysia of Class III Standard

ND = Not detectable; < = less than; - = not available; N = free from visible sheen; discoloration and deposits; and * = no discharge

6.2.3 Air Quality

An ambient air quality sampling was carried out at the Project site to identify significant sources of the existing environment. The sampling location is shown in **Figure 6.6** and summarized as tabulated in **Table 6.5**. The sampling was carried out on 24th to 25th August 2023 at four (4) selected locations for Particulate Matter (PM₁₀), Particulate Matter (PM_{2.5}), Sulphur Dioxide (SO₂), Nitrogen Dioxide (NO₂), Carbon Monoxide (CO) and Ozone (O₃) as well as Volatile Organic Compound (VOC).

Table 6.5: Location of Ambient Air Quality Monitoring Stations

Location	Description	Coordinates	
		Latitude	Longitude
A1	Project Boundary	4°30'44.4"N	101°08'54.6"E
A2	Nearest Shophouse at Taman Seri Raia	4°30'38.6"N	101°08'24.7"E
A3	Nearest House at Kg. Tekkah	4°30'05.6"N	101°08'48.6"E
A4	Entrance at Auasia Nutriculture (Agro-based Industry)	4°30'53.3"N	101°09'04.0"E

Methodology

The environmental air samples were collected from the fixed points by drawing the air from the surrounding area through the Low Flow Air Sampler for Particulates Matter, PM₁₀ & PM_{2.5}. For NO₂ and SO₂ at a specified duration, the sample is passed through a Mass Flowmeter whereas CO and O₃ were measured using an Air Quality Monitor and an Ozone Monitor respectively.

Results and Discussion

The results of air quality monitoring are tabulated in **Table 6.6** and the air quality parameters that have been determined at the nearest sensitive areas for study are PM₁₀, PM_{2.5}, SO₂, NO₂, CO and O₃.

The findings were compared with the Malaysia Ambient Air Quality Standard (MAAQS) by DOE (2020). The certificates of analysis are included in **Appendix 6.2**. The air quality at the Project site and its surrounding areas were found to be good. The PM₁₀, PM_{2.5}, NO₂, SO₂, CO, O₃ and VOC levels measured were found to be far below the respective standard limit.

Table 6.6: Ambient Air Quality Measurement Results

Parameters	Results				MAAQS (2020)
	A1	A2	A3	A4	
PM ₁₀ , µg/m ³	32	24	21	30	100
PM _{2.5} , µg/m ³	21	15	13	17	35
SO ₂ , µg/m ³	29	23	25	20	250
NO ₂ , µg/m ³	35	27	31	24	280
CO, mg/m ³	3	1	1	2	30
O ₃ , µg/m ³	< 1	< 1	< 1	< 1	180
VOC	< 0.1	< 0.1	< 0.1	< 0.1	NA

Source: Field Sampling Results, EnviChem Consults Sdn Bhd, 2023

6.2.4 Noise Levels

Noise level measurements were taken to establish the background noise levels in the vicinity of the proposed site and to identify significant sources of noise in the existing environment. The noise level measurement was taken at day-time and night-time by using a high precision integrating sound level meter. The parameter measured is L_{eq}, L₁₀, L₅₀ and L₉₀.

Ambient noise levels measurements were conducted on 24th to 25th August 2022 at four (4) locations using integrating sound level meter. The location of the noise measurement point is indicated in **Figure 6.6** and described in **Table 6.7**.

Table 6.7: Location of Noise Level Monitoring Stations

Location	Description	Coordinates	
		Latitude	Longitude
N1	Project Boundary	4°30'44.4"N	101°08'54.6"E
N2	Nearest Shophouse at Taman Seri Raia	4°30'38.6"N	101°08'24.7"E
N3	Nearest House at Kg Tekkah	4°30'05.6"N	101°08'48.6"E
N4	Entrance at Auasia Nutriculture (Agro Based Industry)	4°30'53.3"N	101°09'04.0"E

Methodology

The background noise levels were measured using Larson Davis Sound Level Meter.

Results and Discussion

Table 6.8 presents the results of noise level measurement. Field measurement results of noise quality analysis are appended in **Appendix 6.3**.

The results are compared against DOE Planning Guidelines for Environmental Noise Limits and Control recommended limits (**Table 6.9**) where the maximum permissible sound level (LA_{eq}) for designated industrial zones is 75 dB(A) during daytime and night time for the N1 and N4.

Based on the measurement results, the following analysis can be derived that the noise at point N1, N2, N3 and N4 were within the limits for day and night time as stated in Schedule 2 of the Planning Guidelines for Environmental Noise Limits and Control by DOE. The noises at N1, N2 and N4 are mainly captured from nearby vehicular movement.

Table 6.8: Results of Noise Measurement

Sampling Location	Session	LAeq, dB(A)	DOE Limit for LAeq dB(A)
N1	Day	62.4	≤ 70.0
	Night	59.0	≤ 65.0
N2	Day	58.1	≤ 60.0
	Night	53.0	≤ 55.0
N3	Day	51.2	≤ 60.0
	Night	48.3	≤ 55.0
N4	Day	54.6	≤ 70.0
	Night	50.0	≤ 65.0

Source: Field Measurements, EnviChem Consults Sdn Bhd, 2023

Note: **Bold** values refer to levels beyond the permissible limit.

Table 6.9: Maximum Permissible Sound Level (LAeq) by Receiving Land Use for Planning and New Development

Receiving Land Use Category	Maximum Permissible Sound Level (LAeq) [dB(A)]	
	Day Time 7.00 am – 10.00 pm	Night Time 10.00 pm – 7.00 am
Low Density Residential, Noise Sensitive Receptors, Institutional (School, Hospital, Worship Areas)	60	55
Sub-urban and Urban Residential, Mixed Development	65	60
Commercial Business Zones	70	65
Industrial Zones	75	75

Source: Guidelines for Environmental Noise Limits and Control, DOE, 2019 (3rd Edition)



Figure 6.6: Baseline Monitoring Stations for Water Quality, Air Quality and Noise Levels

6.2.5 Groundwater Quality

A groundwater well was installed at the Project site on 19 December 2023. This is to monitor groundwater levels and groundwater quality. Groundwater sample was collected from the well to determine the physical and chemical characteristics of groundwater at the Project site. Its location is summarized in **Table 6.10** and shown in **Figure 6.7**.

Table 6.10: Groundwater Quality Monitoring Station

Location	Description	Coordinates	
		Latitude	Longitude
BH1	Boundary of Project Site	4°30'42.66"N	101°8'55.09"E



Figure 6.7: Monitoring Station for Groundwater Quality

The analysis of groundwater sample was completed on 5 January 2024. The results of the analysis are tabulated and compared with various standards such as Malaysia Groundwater Quality Standards for Conventional Raw Water Treatment (Drinking Water) in **Table 6.11**. The groundwater well drilling, and installation records are attached in **Appendix 6.5**. The groundwater laboratory results are attached in **Appendix 6.4**.

All tested parameters are within limit specified in the Malaysia Groundwater Quality Standards Index (2019) or MGWQSI (2019).

Table 6.11: Groundwater Quality Monitoring Results

Parameter	Unit	Station BH1	*MGWQSI (2019)
Temperature	°C	28.7	Normal $\pm$ 2
pH	-	7.05	5.5 – 9.0
Dissolved Oxygen	mg/l	4.0	-
Total Suspended Solids	mg/l	10	-
Conductivity	μ S/cm	249.6	1000
^Chloride	mg/l	31	250
^Turbidity	NTU	7.50	1000
Mercury (Hg)	mg/l	ND (< 0.002)	0.001
Cadmium (Cd)	mg/l	ND (< 0.002)	0.003
Chromium (Cr)	mg/l	ND (< 0.02)	0.05
Arsenic (As)	mg/l	ND (< 0.003)	0.01
Cyanide (CN)	mg/l	0.03	0.07
Lead (Pb)	mg/l	0.01	0.05
Copper (Cu)	mg/l	ND (< 0.03)	1.0
Manganese (Mn)	mg/l	0.20	0.2
Magnesium (Mg)	mg/l	1.35	150
Nickel (Ni)	mg/l	0.01	0.04
Zinc (Zn)	mg/l	ND (< 0.01)	3.0
Iron (Fe)	mg/l	0.14	1.0
Selenium (Se)	mg/l	ND (< 0.001)	0.01
Fluoride	mg/l	ND (< 0.05)	1.5
^Hardness	mg/l	35.5	500
Argentum (Ag)	mg/l	ND (<0.01)	0.05
Ammoniacal Nitrogen	mg/l	0.38	1.5
Nitrite Nitrogen	mg/l	0.36	0.4
^Nitrite Nitrogen	mg/l	8	10
Phenol	mg/l	ND (< 0.001)	0.002
^Sodium	mg/l	0.94	200

^Sulphate	mg/l	0.72	250
Oil & Grease	mg/l	ND (< 0.01)	0.3

Source: Malaysia Groundwater Quality Standards for Conventional Raw Water Treatment (Drinking Water)

Note: Figure in **BOLD** indicates reading exceeded limit stated in MGWQSI (2019)

ND = not detectable; < = less than; - = not available; N = free from visible sheen, discoloration and deposits; ^ = not accredited and * = standard limit requested by customer

6.2.6 Meteorological Data

The meteorological data and information on the project area and its surrounding areas have been obtained from the nearest meteorological station, which is Ipoh Station (Coordinates: 4° 34' N, 101° 06' E) that was acquired from Malaysia Meteorological Department.

6.2.6.1 Rainfall

In general, the mean monthly rainfall from the year 2010 to the year 2021 is more than 110 mm. The highest mean rainfall was recorded in the month of November (341.5 mm) at Ipoh Station, which was influenced by the Northeast Monsoon (**Figure 6.7**). There are four seasons that can be distinguished namely, the southwest monsoon, northeast monsoon and two shorter periods of inter-monsoon seasons. The mean total annual rainfall for the years 2010-2021 was 2,843.1 mm.

The number of rainy days was the lowest in the month of July, with a mean of 11 days and highest was in the month of April and November, with a mean of 22 days (**Figure 6.8**). The precipitation during the transitional months could be rather unpredictable and vary with the timing of the onset and recess of the monsoons.

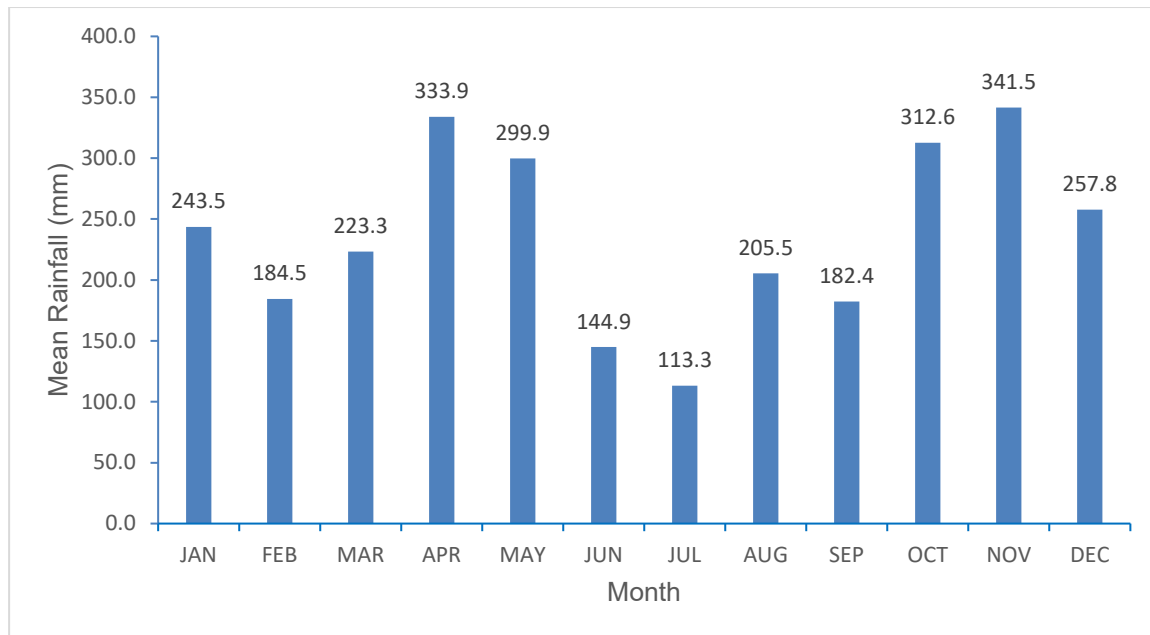


Figure 6.8: Mean Annual Rainfall at Ipoh Meteorological Station from the Year 2010 until the Year 2021

Source: Malaysia Meteorological Department, 2022

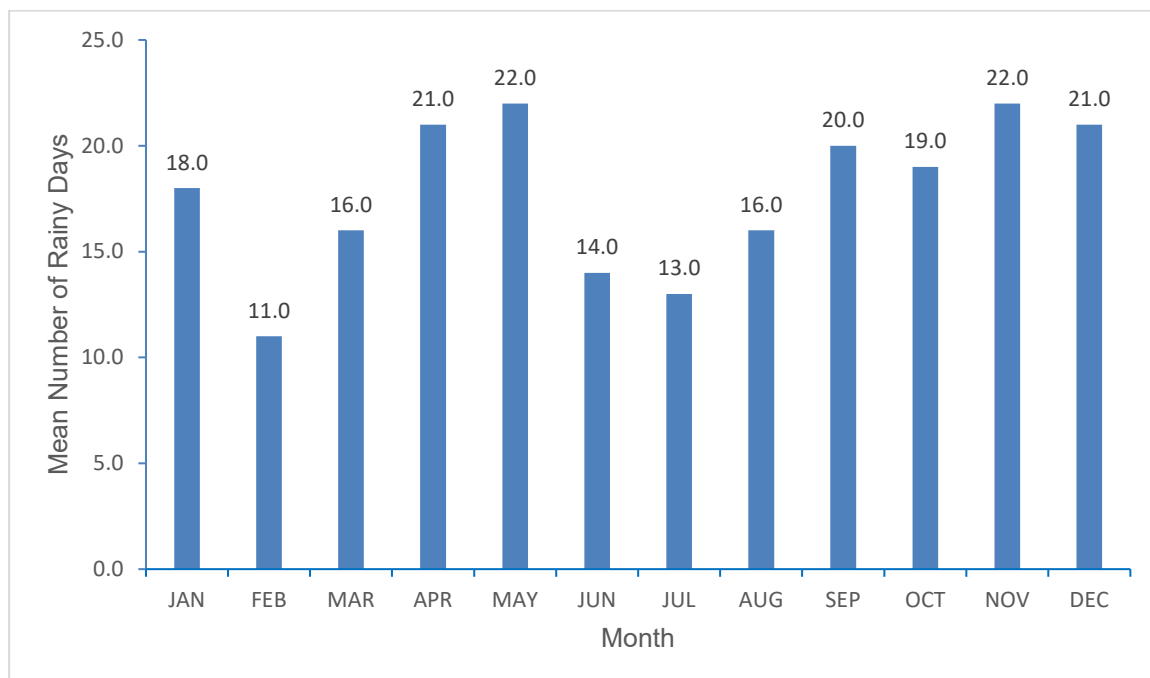


Figure 6.9: Mean Number of Rainy Days at Ipoh Meteorological Station from the Year 2010 until the Year 2021

Source: Malaysia Meteorological Department, 2022

6.2.6.2 Temperature

The mean daily temperature at Ipoh Station is for the year 2010 until the year 2021. The highest mean temperature was about 28.1°C which occurred in June while the lowest mean temperature was 26.6 °C in December. The variation in mean temperature is shown in **Figure 6.9**. Other than that, the mean daily evaporation at Ipoh Station as shown in **Figure 6.10** was the highest in the month of March (4.9 mm). The lowest mean of evaporation was in the month of November (3.4 mm). This is associated with the high mean rainfall amount in the month of November as shown in **Figure 6.7**.

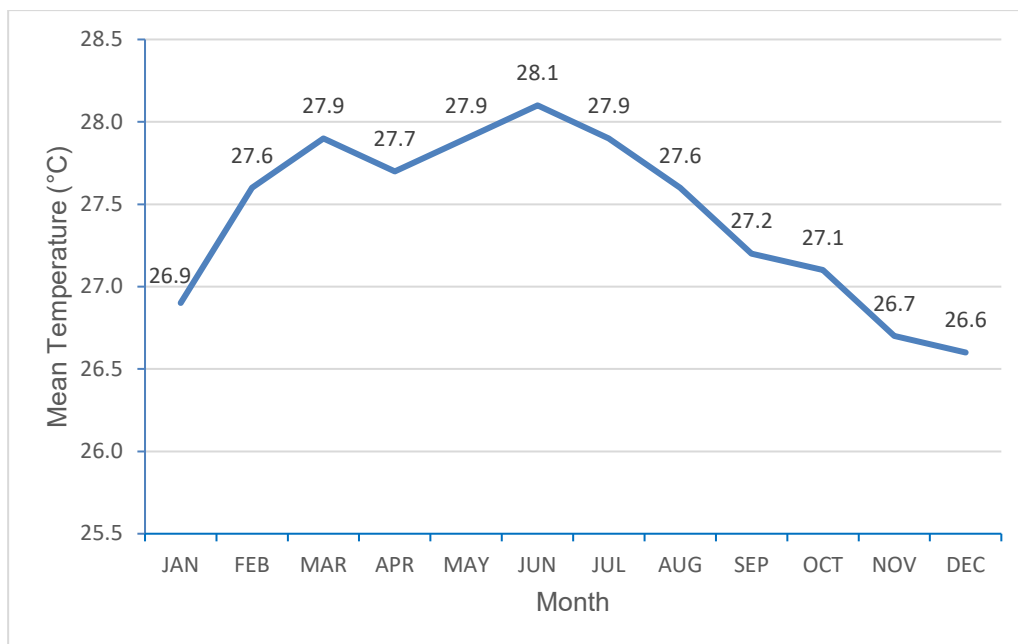


Figure 6.10: 24-Hour Mean Temperature at Ipoh Meteorological Station from the Year 2010 until the Year 2021

Source: Malaysia Meteorological Department, 2022

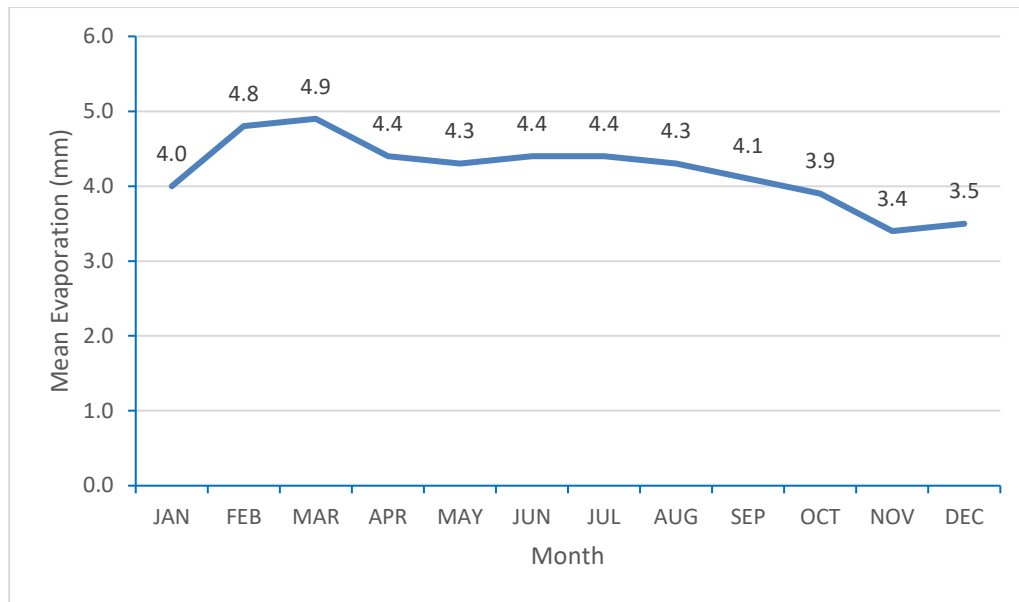


Figure 6.11: Mean Daily Evaporation at Ipoh Meteorological Station from the Year 2010 until the Year 2021

Source: Malaysia Meteorological Department, 2022

6.2.6.3 Relative Humidity

The highest mean relative humidity occurred in November which was about 84.4% while the lowest mean relative humidity occurred in February at 75.5%. The variation in relative humidity is shown in **Figure 6.11**.

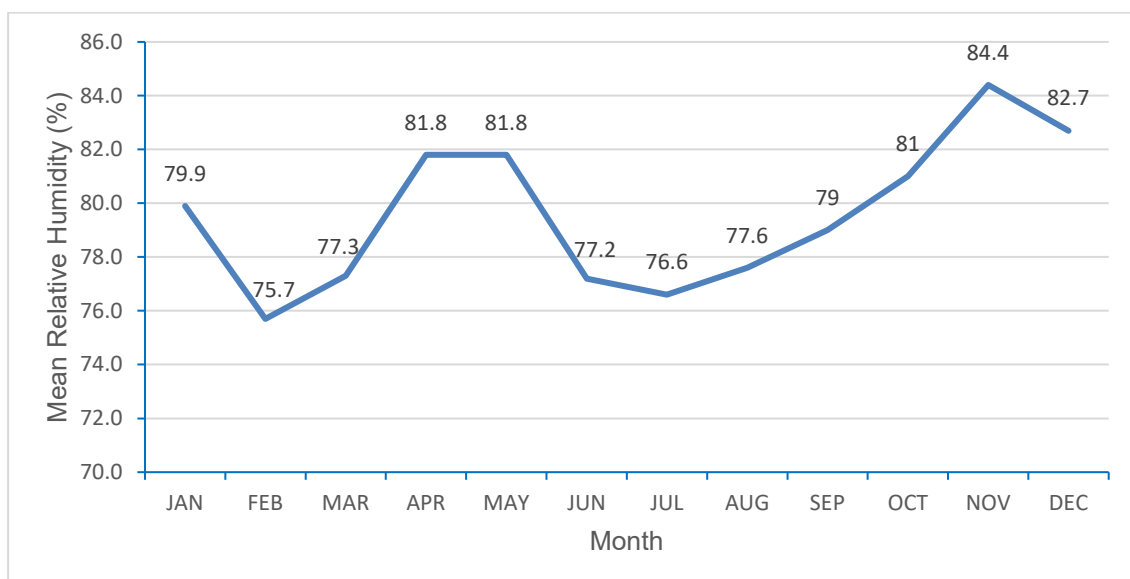


Figure 6.12: 24-Hour Mean Relative Humidity at Ipoh Meteorological Station from the Year 2010 to the Year 2021

Source: Malaysia Meteorological Department, 2022

6.2.6.4 Surface Wind

Wind frequencies and direction recorded at Ipoh Station for a period of 2010 to 2021 are summarized in the following **Table 6.10** while the wind rose is presented in **Figure 6.12**. The table and figure show that the predominant wind is Northeast (33.2%) most of the time and the percentage occurrence of calm wind is 8.4%.

Table 6.12: Annual 24 Hour Mean Surface Wind Speed (m/s) from Year 2010 to 2021

Percentage frequencies of occurrence for concurrent wind direction (degrees) and speed (m/s) within specified ranges [%]								
Wind Speed Range								
Direction	0.3-1.5	1.6-3.3	3.4-5.4	5.5-7.9	8.0-10.7	>10.7	Total	Mean Speed
Calm							8.4	
Variable	0	0	0	0	0	0	0	
N	5.8	7.4	0.9	0.1	0	0	14.2	1.9
NE	12.2	18.4	2.5	0.1	0	0	33.2	2
E	7.2	1.9	0.1	0	0	0	9.1	1.2
SE	3.6	0.6	0	0	0	0	4.2	1
S	7	7.2	0.5	0	0	0	14.7	1.7
SW	2.5	5.9	2.2	0.2	0	0	10.8	2.5
W	1.4	0.9	0.2	0.1	0	0	2.6	1.8
NW	1.2	0.5	0.2	0	0	0	2	1.7

Note: N – North; NE – Northeast; E – East; SE – Southeast; S – South; SW – Southwest; W – West; NW – Northwest.

Source: Malaysian Meteorological Department, 2022

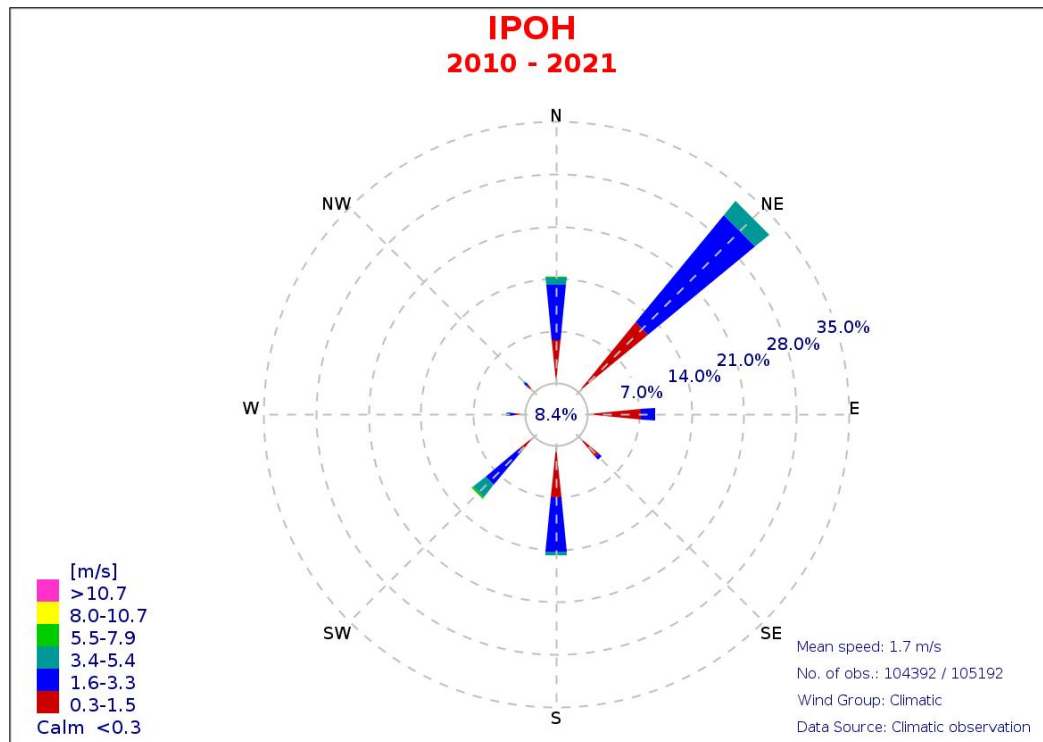


Figure 6.13: Annual Wind Rose in Ipoh Station from the Year 2010 to the Year 2021

Source: Malaysia Meteorological Department, 2022

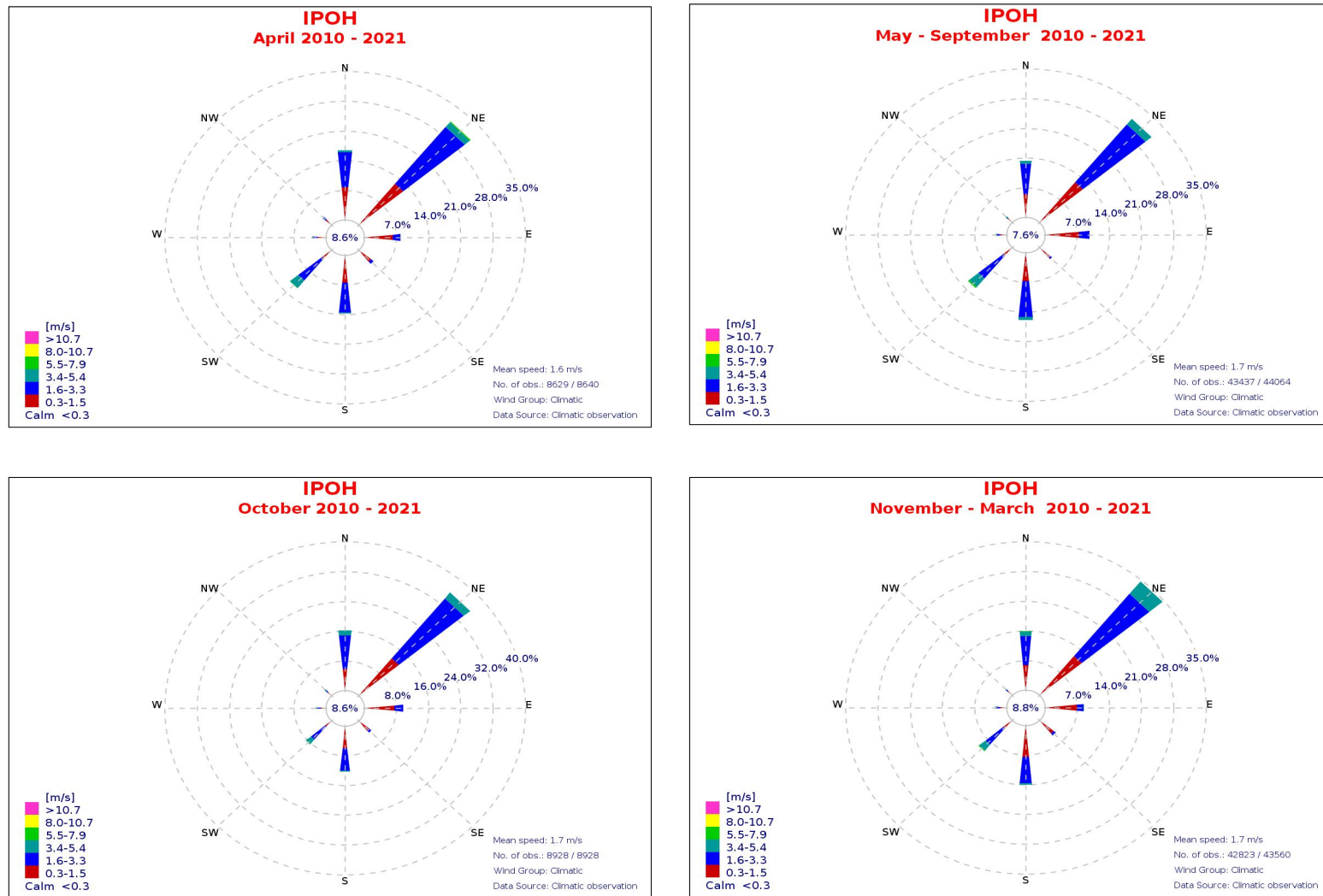


Figure 6.14: Seasonal Wind Rose in Ipoh Station from the Year 2010 to the Year 2021

Source: Malaysia Meteorological Department, 2022

6.3 BIOLOGICAL ENVIRONMENT

The Project site is located in Kawasan Perindustrian Tungzen on a piece of flat land. Vegetation was cleared to begin construction works. There was no significant biological habitat was found at the site.

6.4 HUMAN ENVIRONMENT (SOCIO-ECONOMY)

6.4.1 Land Use Study

The Project site is sited on one piece of industrial lot within the Kawasan Perindustrian Tungzen. Industrial activities are the main activities surrounding the site. The nearest settlement areas, namely Kampung Kurnia which are located within 0.93 km of Project boundary.

6.4.2 Existing Land Use

The primary land use within the impact area (1 km radius and 5 km radius) of the Project site is shown in **Figure 6.15** and **Figure 6.16**. The planned land use map within 5 km of the Project site is shown in **Figure 6.17**. The photos of relevant neighboring land use are shown in **Figure 6.14**.

Immediate Land Use within Project Site

The Project site is located within Kawasan Perindustrian Tungzen, a developed industrial area in Kampung Kepayang, Perak. Presently, the Project site is being constructed on PT 2662 (Lot 225111), Jalan Gopeng, Kawasan Perindustrian Tungzen, Mukim Sungai Raya, 31300 Kampung Kepayang, Perak Darul Ridzuan.

Land Use within 250 m Radius from the Project Site

The land use within 250 m radius from the boundary of Project site are dominated by industrial premises (Kawasan Perindustrian Tungzen,). Some of the surrounding industries include DNK Metal Recovery (M) Sdn. Bhd. and Meranti Indah Sdn Bhd, both located to the west of the Project site. There is also an unnamed factory with a grey roof to the south of the Project site.

Land Use within 250 m to 1 km Radius from the Project Site

The surrounding area is still under Kawasan Perindustrian Tungzen. There are two restaurants (amenities), namely Restoran Nadia Thai Food and Restoran Imran, located to the southwest of the Project site. Gua Naga Mas is a Buddhist temple located to the south of the project.

Land Use within 1 km to 3 km Radius from the Project Site

Land use within 1 km to 3 km radius from the boundary of the Project site are made up of industrial areas and commercial areas at the north. The west area of the Project site is dominated by institutions, residential areas and places of worship.

Land Use within 3 km to 5 km Radius from the Project Site

Land use within the 3 to 5 km radius from the Project site is mainly in residential and plantation areas with some public amenities. Residential areas are Taman Gopeng, Taman Raia Indah, Simpang Pulai, etc.

Table 6.13: Existing Land Use within 5 km Radius from the Project Site

Distance from Project Site	Key Existing Land Use Parameters
0 – 250 m	The dominant land use within 250 m from the Project site is industries. <u>Factory</u> • Unnamed Factory (Grey Roof) • Unnamed Factory (Blue Roof) • DNK Metal Recovery (M) Sdn Bhd • Metric Concrete Industries Sdn Bhd • Labzinc Industries (M) Sdn Bhd • Meranti Indah Sdn Bhd
250 m – 1 km	The dominant land use within 250 m - 1 km from the Project site are industries, commercial and worship areas. <u>Factory</u> • Megatrax Plastic Industries Sdn Bhd • Gopeng Kalsium Sdn Bhd

Distance from Project Site	Key Existing Land Use Parameters
	• Sin Yong Guan Food Industries Sdn Bhd • Shen Fei Enterprise • ATP Business Solution • Meng Siang Plastic Sdn Bhd • Trans Reliance Logistics Sdn Bhd • Unioleo Sdn Bhd • Rancak Asia Sdn Bhd • Kitaran Recovery Sdn Bhd • Central Geo Sdn Bhd • Lip Tack Engineering Sdn Bhd • Mrc Industries Sdn Bhd • W O Plastic Sdn Bhd • Simpang Pulai Premix Plant Sdn Bhd • Cmi Construction Material Industry Sdn Bhd • Acon Sdn Bhd • Alam-Con Sdn Bhd • Timberdeck Sdn Bhd • Supreme Trans Logistics Sdn Bhd Depoh • Gen Master Manufacturing Sdn Bhd • Pyramid Lane (M) Sdn Bhd • Kam Chuen Tin Smith <u>Amenities</u> • Restoran Nadia Thai Food • Restoran Imran <u>Worship</u> • Gua Naga Mas (Buddhist Temple)
1 km – 3 km	The dominant land use within 1 km – 3 km from the Project site are industries, residential areas, institutions, commercial and worship areas. <u>Factory</u> • K2 Bitumen Sdn Bhd

Distance from Project Site	Key Existing Land Use Parameters
	• Srt Teck Realistic • Majuperak Solar Power Plant • Mega Vet Feedingstuffs Sdn Bhd • Ocean Glory Seafood Sdn Bhd • Tehki Food Manufacturing Sdn Bhd • Lotus's Distribution Centre • Leng Wah Fishery Sdn Bhd • Agro Bazaar • Veg Station (M) Sdn Bhd • Dk Frozen Food Sdn Bhd • S.R. Marble Simpang Pulai Factory • Britestone Gml Quarry Sdn Bhd • Cabaran Granite Sdn Bhd • Agrostone (Malaysia) Sdn Bhd • One Ice Enterprise • Azfar Food Industry <u>Worship</u> • Surau Al-Adha • Chinese Cemetery Kg Kepayang • Masjid Nur Ramadhan • Kuil Sri Siva Subramaniam • Kong Fook Ngam Cave Temple • Gurdwara Sahib Kampung Kepayang <u>Residential Areas</u> • Kampung Tekkah • Taman Herba • Taman Seri Raja • Kampung Kurnia • Kampung Kepayang

Distance from Project Site	Key Existing Land Use Parameters
	<u>Amenities</u> • Agro Bazaar • J&T Express Perak-Ldc Gopeng • Pejabat Penghulu Mukim Sungai Raya • The Treasure @ Taman Herba Gopeng • Cengkerik Eco Park <u>Institution</u> • Madrasah Al-Ridhuaniah • Sekolah Kebangsaan Sungai Raya, Perak
3 km – 5 km	The dominant land use within 3 km – 5 km from the Project site are industries, residential areas, institutions, commercial and worship areas. <u>Factory</u> • Tkn Pulai Quarry Sdn Bhd – Quarry • Cao Minerals Sdn Bhd • Uniko Calcium Carbonate Industry Sdn Bhd • Imerys Minerals Malaysia Sdn Bhd • Tct Farm Sdn Bhd • Asia Meranti Solar (Kampar) Sdn Bhd – 10 MWAC LSSPV • Eurostar Tractors (M) Sdn Bhd • Vsafe Food Products Sdn Bhd <u>Worship</u> • Chinese Cemetery • Arulmigu Dewa Muniswarar Alayam • Surau Al-Taqwa • Surau Kampung Tualang Tujuh • Surau Kampung Sungai Ular • Masjid Sayyidina Umar Al-Khattab • Surau Al-Falah • Buddhist Temple Dewi Loong Tou San • Surau Islamiah Taman Bersatu

Distance from Project Site	Key Existing Land Use Parameters
	<u>Residential Areas</u> • Taman Gopeng • Taman Raia Indah • Simpang Pulai <u>Amenities</u> • Dewan Serdang Permai • Dewan Komuniti Taman Bersatu • Simpang Pulai Pasar • Kompleks Vektor Pejabat Kesihatan Kinta • Simpang Pulai Rural Clinic <u>Institution</u> • SJK (C) Man Ming • Sekolah Rendah Al-Ihsan (Seri) • Sekolah Menengah Kebangsaan Simpang Pulai • Sekolah Kebangsaan Simpang Pulai • SJK (C) Phui Ying Simpang Pulai

Key Land Use within 1 km of the Project Site	
 22 Jun 2022 11:22:55 am 4°30'43"N 101°8'52"E Jalan Tanpa Nama Gopeng Perak	 22 Jun 2022 11:24:05 am 4°30'40"N 101°9'4"E Jalan Tanpa Nama Kampung Kepayang Perak
Meranti Indah Sdn Bhd	Labzinc Industries Sdn. Bhd.
 22 Jun 2022 11:22:17 am 4°30'42"N 101°8'43"E Kampung Kurnia Kampung Kepayang Perak	 22 Jun 2022 11:21:21 am 4°30'43"N 101°8'49"E Kampung Kurnia Kampung Kepayang Perak
Gopeng Kalsium Sdn. Bhd.	DNK Metal Recovery (M) Sdn. Bhd.
 22 Jun 2022 11:21:37 am 4°30'43"N 101°8'48"E Kampung Kurnia Kampung Kepayang Perak	 22 Jun 2022 11:26:34 am 4°30'44"N 101°8'42"E Jalan Tanpa Nama Kampung Kurnia Gopeng Perak
Metric Concrete Industries Sdn. Bhd.	Shen Fei Enterprise



Figure 6.15: Key Land Use Within 1 km of the Project Site

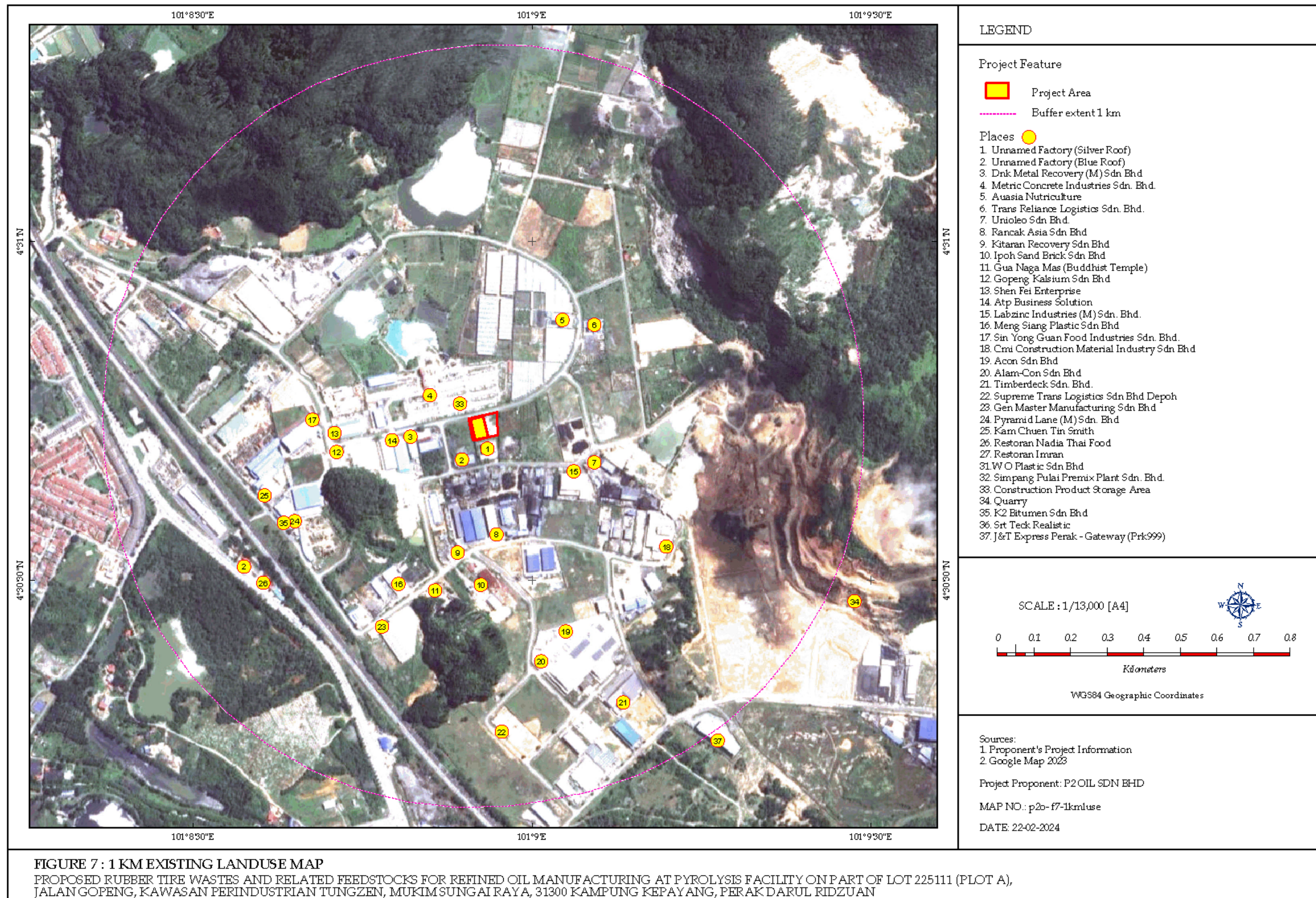


Figure 6.16: Existing Land Use Map Within 1 km of the Project Site

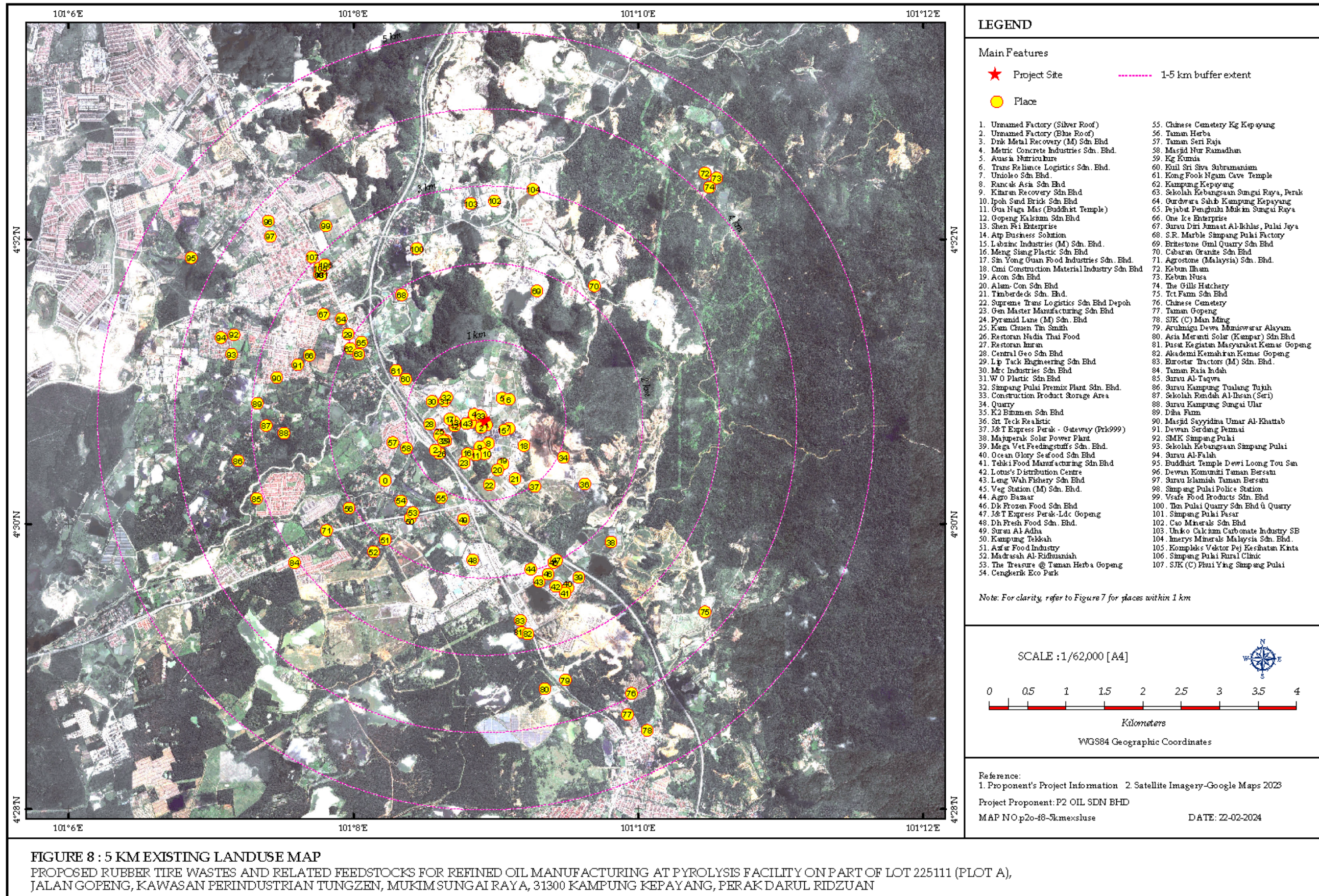


Figure 6.17: Existing Land Use Map Within 5 km of the Project Site

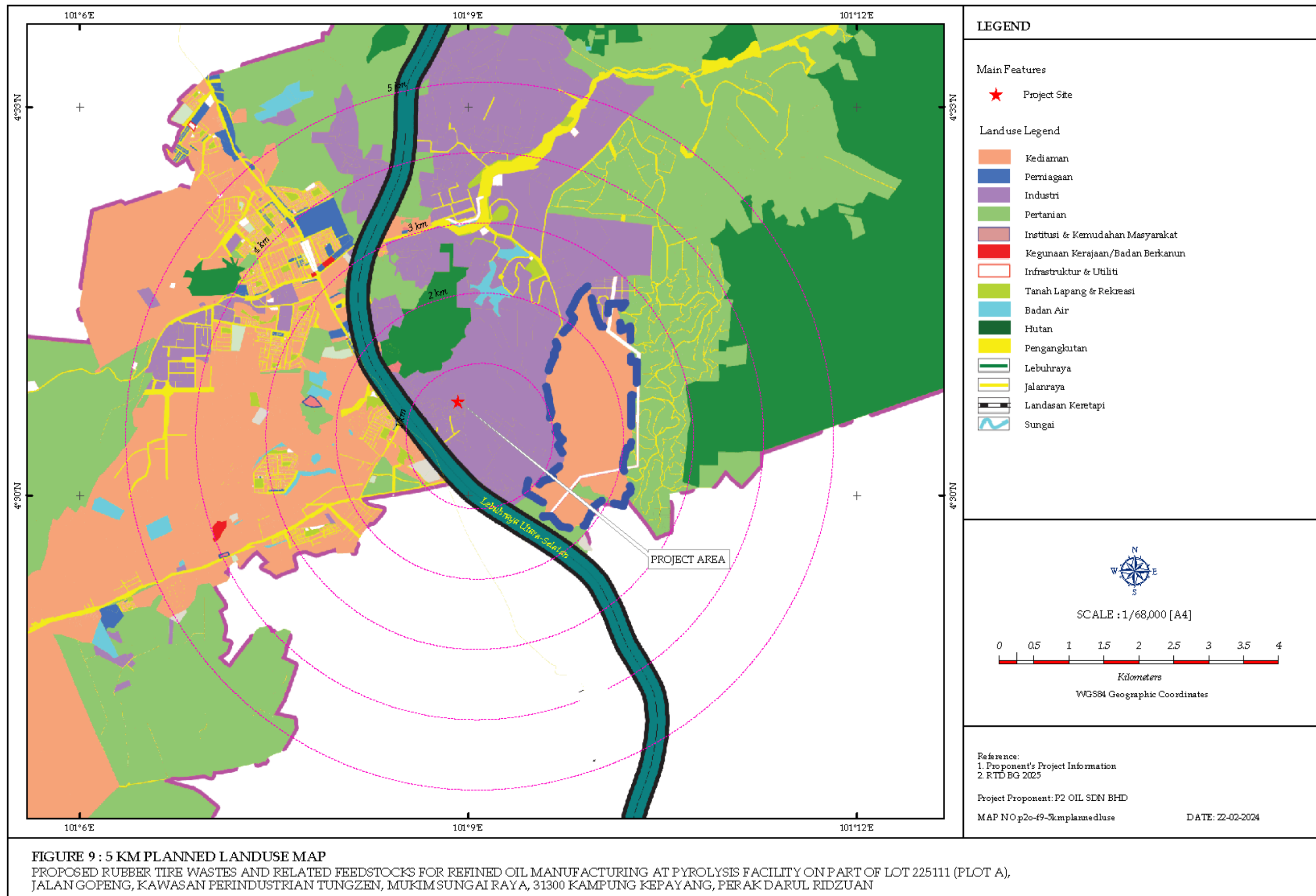


Figure 6.18: Planned Land Use Map Within 5 km of Project Site

6.4.3 Environmental Sensitive Area

The Project area is not classified as an environmentally sensitive area (ESA) in the National Physical Plan 4, and Rancangan Tempatan Daerah Batu Gajah 2025. During the site investigation carried out in June 2022, there were only some shrubs and overgrown vegetation in the surrounding area. These shrubs and overgrown vegetation shall be cleared during the construction at the Project site. However, flora and fauna within the Project site does not have any conservation value, and therefore the Project will not cause any loss in biodiversity. The surroundings of the Project site are designated for industrial park development and there are some existing heavy industry establishments within the industrial area.

The Project provides an alternative off-site rubber waste recovery facility to help reduce, recycle and reuse rubber tire wastes. The Project concept will reduce the introduction and accumulation of used rubber tires in many areas which otherwise will be detrimental to the environment and society. This environmental-friendly concept and approach will help preserve and enhance the environmental quality. The Project is therefore compatible with DOE's policy.

6.4.4 Socially Sensitive Area

The Project site is located in Kawasan Perindustrian Tungzen which is an industrial zone. The factory is mainly surrounded by other heavy industry factories. There are existing Malay village settlements about 1.5 km from the Project site, i.e., Kampung Tekkah and Kampung Kepayang.

6.4.5 Siting and Zoning Review

6.4.5.1 National Physical Plan 4 (NPP-4)

In reference to the National Physical Plan 4 (NPP-4), the Project site is located in Kawasan Perindustrian Tungzen which is one of the industrial areas within Batu Gajah area. In terms of environmental sensitivity, the Project is located within Kawasan Perindustrian Tungzen, outside of any environmental sensitive area (ESA). The assessment as per ESA framework criteria in accordance with Table 4.5 of the NPP-4 is detailed in **Table 6.14**. The ESA map of the Project site is shown in **Figure 6.19**.

Table 6.14: Assessment as per ESA Framework of NPP-4

No.	Area	Criteria	Assessment
RANK 1 - NO DEVELOPMENT AND CHANGE OF LAND USE			
1A	Existing Gazetted Terrestrial and Marine Protected Areas: i. National Park ii. State Park iii. Wildlife Reserve iv. Permanent Reserve Forest (Protection Class) v. Sea Parks vi. Fishing Prohibited Area vii. Seaweed Protection Area viii. Turtle Sanctuary	i. De-publication of protected areas is not allowed (If de-publication is allowed, it needs to go through a strict mechanism) ii. New development, expansion of existing development or extraction of mineral resources (all forms of mining) are not permitted iii. An Integrated Management Plan should be prepared for these areas iv. Ecotourism, research, education, and low-impact development are allowed but subject to matters in the Enactment and Gazetting Act *Related to the prescribed conditions	Project site is sited on one industrial lot within the industrial zone in Kawasan Perindustrian Tungzen. Therefore, it is outside the protected area system.
1B	Permanent Reserve Forest (Production Class)	Sustainable logging is allowed based on the principles of Sustainable Forest Management	Project site is sited on one industrial lot within the industrial zone in Kawasan Perindustrian Tungzen. Therefore, it is outside the forest reserve area.

1C	Forest Plantation Zones within Permanent Forest Reserves (Production Class)	Only allowed in HSK areas that have been zoned as forest plantation establishment zones in production forests by the 68th National Land Council dated 9 August 2012 where: i. Forest plantation zones are not allowed in areas where the value of ecosystem services and biodiversity is high ii. The area of the zone does not exceed 5% of the total area of natural forest in each state for a period of 7 years as stipulated in the forest management certification standard under the Malaysian Timber Certification Scheme iii. Forest plantation activities are proposed to apply the concept of agroforestry and mixed farming	Project site is sited on one industrial lot within the industrial zone in Kawasan Perindustrian Tungzen. Therefore, it is outside of the protected area system and forest reserve area.
1D	Areas of Biodiversity Interest but not Gazetted as Protected Areas: i. High Value Government Land Forest (e.g., mangrove, swamp forest, peat swamp forest, freshwater swamp forest, dark forest) ii. Geological Site	i. Journalism needs to be expedited and prioritised ii. New development, expansion of existing development or extraction of mineral resources (all forms of mining) are not permitted iii. An Integrated Management Plan is necessary provided for these areas iv. Ecotourism, research, education, and low impact development are allowed	Project site is sited on one industrial lot within the industrial zone in Kawasan Perindustrian Tungzen. Therefore, it is outside the biodiversity area.

	iii. Limestone Outcrop iv. Quartz Ridge v. Turtle & Loggerhead Landing Site vi. Seagrass Plains vii. Coral Reef Area Outside the Marine Park viii. Sites of Interest for Birds ix. Muddy Plains		
1E	Catchment Areas of Existing and Proposed New Dams	Land use activity is not allowed. Infrastructure facilities other than dam infrastructure are not allowed	Project site is sited on one industrial lot within the industrial zone in Kawasan Perindustrian Tungzen. Therefore, it is outside any dam catchment area.
1F	The Area Above the 1,000m Contour	Development, logging, and agriculture are not allowed	Project site is sited on one industrial lot within the industrial zone in Kawasan Perindustrian Tungzen. Therefore, it is below the 1,000 m contour.

RANK 2 - CONTROL OF SUSTAINABLE DEVELOPMENT AND USE			
2A	Recognised Terrestrial Ecological Corridors such as the Central Forest Spine Ecological Network	i. Any development should follow the strategy and comply with the guidelines in the Central Forest Spine 2 Master Plan	Project site is sited on one industrial lot within the industrial zone in Kawasan Perindustrian Tungzen. Therefore, it is outside any recognised terrestrial ecological corridors.
		ii. Special Area Plans should be prepared for ecological networks that are at a critical level as stated in the Central Forest Spine 2 Master Plan	
		iii. Only conservation agriculture* is allowed and wildlife corridors must be established	
		iv. Only the development of critical infrastructure is allowed such as highways, railways, and electricity transmission lines. But infrastructure needs to be designed and built in an environmentally friendly manner and not result in habitat fragmentation	
2B	The Marine Ecological Corridor Recognised as Ecologically and Biologically Sensitive Marine Areas (EBSA) and Important Marine Mammal Area (IMMA)	i. An Integrated Management Plan should be prepared to identify the corridor boundaries and outline specific management measures	Project site is sited on one industrial lot within the industrial zone in Kawasan Perindustrian Tungzen. Therefore, it is outside any marine ecological corridors.
		ii. Management zones should be established based on beneficial use following local needs and factors such as conservation, ecotourism, fisheries, and sustainable use	

2C	The Islands in the Marine Park Area	All development on the islands and within the marine park area must fully comply with existing and future guidelines	Project site is sited on one industrial lot within the industrial zone in Kawasan Perindustrian Tungzen. Therefore, it is not in any marine park area.
2D	Areas of Peat, Soft Soil, Sinkholes, and Former Underground Mines	i. A site suitability study should be carried out before this area is developed	Project site is sited on one industrial lot within the industrial zone in Kawasan Perindustrian Tungzen. Therefore, it is not in any peat, soft soil, sinkholes, and underground mines.
		ii. Development applications can be considered taking into account potential disaster impacts, engineering solution methods and development feasibility accompanied by approval conditions	
2E	River Reserve	i. Strips of land adjacent to the river are maintained as state land and gazetted according to reserve provisions; guided by the minimum width as recommended by the Department of Irrigation and Drainage	Project site is sited on one industrial lot within the industrial zone in Kawasan Perindustrian Tungzen. Therefore, it is not in any river reserve.
		ii. Existing development activities that operate without license and permission need to be identified and considered by the state authorities to go through the bleaching process or be moved/demolished if they pollute the river and cause a nuisance	

2F	Areas Exceeding the 1,000 m Contour that have been Developed and are Special Management Areas (KPK): i. Cameron Highlands-Kinta-Lojing ii. Genting Highlands-Bukit Tinggi-Janda Baik iii. Fraser Hill	A Special Area Plan (RKK) needs to be prepared as a development control for developed highland areas	Project site is sited on one industrial lot within the industrial zone in Kawasan Perindustrian Tungzen. Therefore, it is not in any special management area.
		New urban and agricultural development in highland areas is only allowed in two (2) KPKs, namely: i. Cameron Highlands-Kinta-Lojing, and ii. Genting Highlands-Bukit Tinggi-Janda Baik	
		New development is not allowed in Bukit Fraser KPK. Existing development needs to comply with the strategy and guidelines contained in the Fraser Hill Development Coordination Study	
2G	Area between Contours 150 m to 1,000 m	Any use complies with existing and future guidelines	Project site is sited on one industrial lot within the industrial zone in Kawasan Perindustrian Tungzen. Therefore, it is not in any area between 150 m and 1,000 m.
2H	Important Areas for Food Security: i. National Rice Granary Site ii. Permanent Garden of Food Production iii. Aquaculture Industrial Zone	i. These areas cannot be converted to other types of land use except for habitat restoration activities for uncultivated areas	Project site is sited on one industrial lot within the industrial zone in Kawasan Perindustrian Tungzen. Therefore, it is not in any area affecting food security.
		ii. Sustainable farming and fishing activities are allowed	
		iii. Sustainable extraction or use of resources is allowed	
		iv. Agricultural practices using Best Management Practices need to be implemented by entrepreneurs with close monitoring by the authorities	

2I	Water catchment area and groundwater recharge zone for well use	i. The catchment areas of the water intake level and the compensation zone need to be mapped at the RSN and RT levels	Project site is sited on one industrial lot within the industrial zone in Kawasan Perindustrian Tungzen. Therefore, it is not in any water catchment area
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Source: NPP-4, 2021 (Table 5-3)

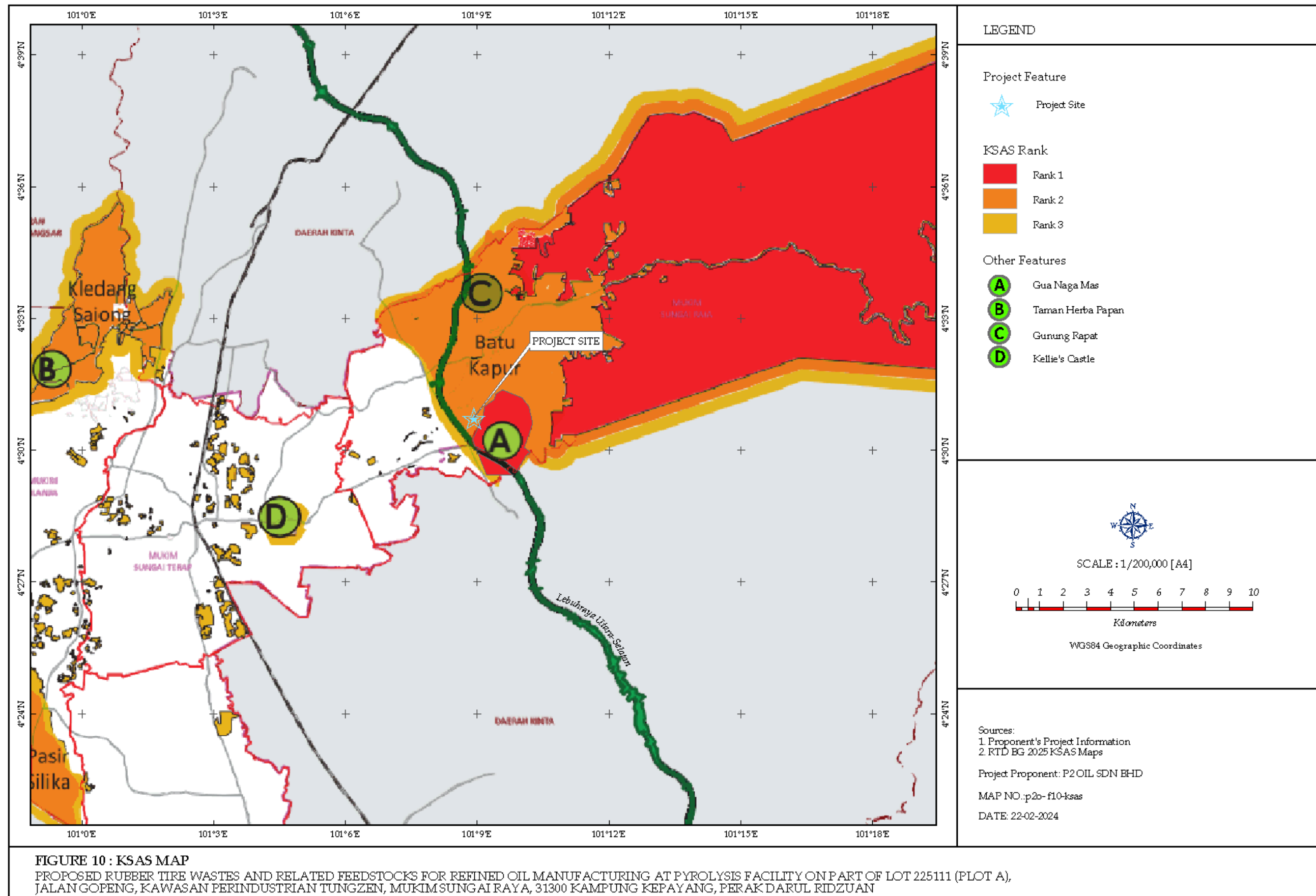


Figure 6.19: Environmental Sensitive Area (ESA) Map

6.4.5.2 Perak Structure Plan 2040

A review of the proposed Project against Rancangan Struktur Negeri (RSN) Perak 2040 revealed that the Project is in line with *Dasar Perancangan 20* on encouraging the efficient management of waste disposal to reduce the required total waste disposal. The policy statement is described as below:

Dasar Perancangan 20 (RSA 20): Meningkatkan Keberkesanan Sistem Infrastruktur dan Menekankan Amalan Teknologi Hijau Bagi Menyokong Pembangunan Negeri Perak

Strategik Pelaksanaan 20.6 (SP20.6): Menyediakan Pengurusan Sisa Pepejal dan Buangan Terjadual Secara Bersepadu Dengan Sistem Rawatan Sisa Berlandaskan Teknologi dan Tumpuan Kepada Pengawalan Terhadap Pencemaran

Review on the physical land development plan proposed in Rancangan Struktur Negeri Perak 2040 shows that the Project site is located within one of the Priority Development Area in Batu Gajah as shown in the **Figure 1.4**. The location of the Project within the Kawasan Perindustrian Tungzen is believed could help facilitate development in the surrounding area and compatible with the existing land uses. Also, based on **Table 1.5**, the estimated land use and physical development is expected to continue to increase in the coming years.

Table 6.15: Indicator of Land Use and Physical Development

Cadangan Indikator Perak 2040	Semasa (2015)	Cadangan Sasaran Pencapaian				
		2020	2025	2030	2035	2040
Luas tanah industri terancang diperlukan (hektar)	2,935	3,497	4,073	4,630	5,288	6,098

Source: Rancangan Struktur Negeri Perak 2040 (Jadual 7.9)

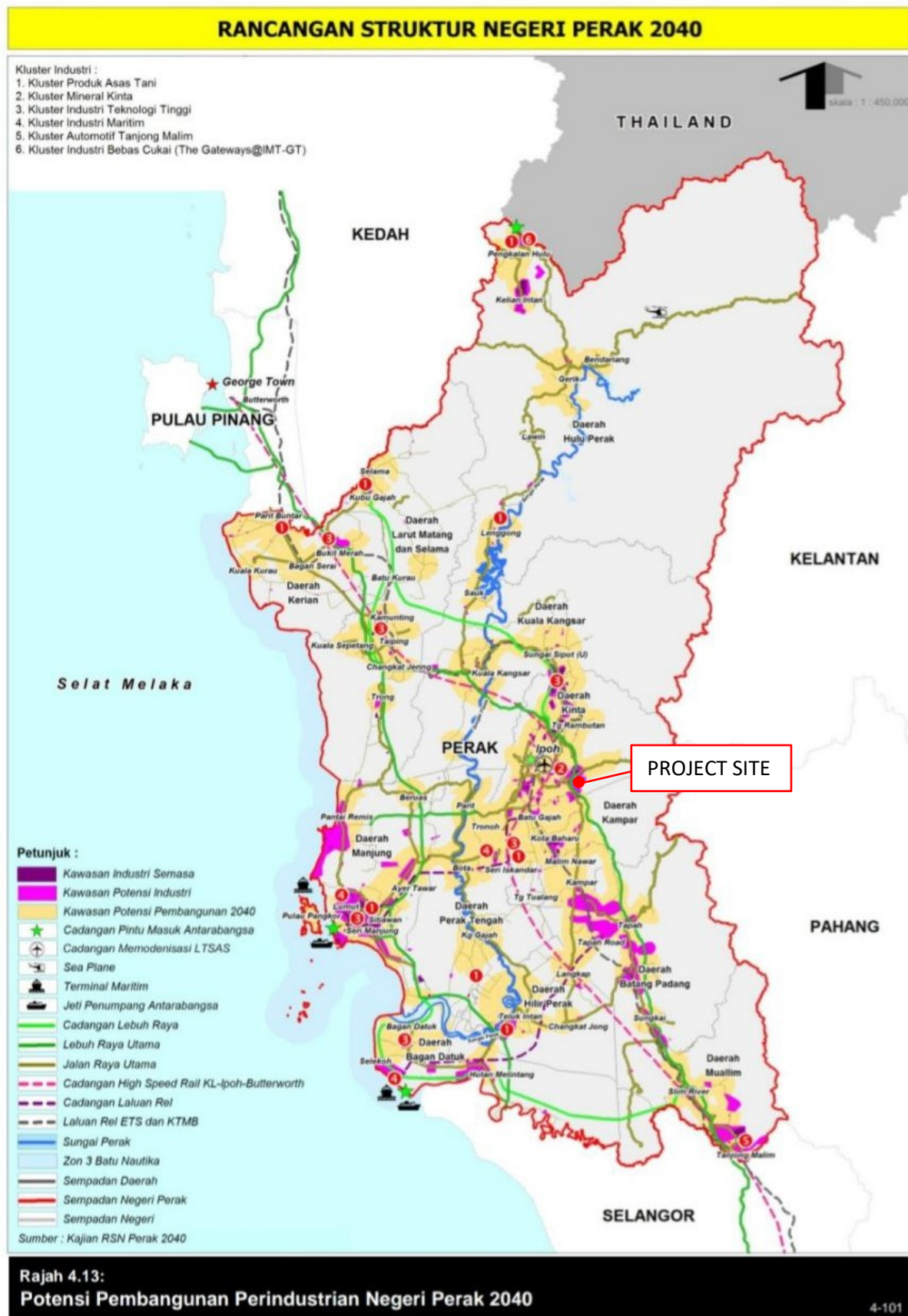


Figure 6.20: Industrial Development Cluster Plan

Source: Rancangan Struktur Negeri Perak 2040 (Rajah 4.13)

6.4.5.3 Rancangan Tempatan Daerah Batu Gajah (RTDBG) 2025

A review of the proposed Project against Rancangan Tempatan Daerah Batu Gajah (RTDBG) 2025 revealed that the Project is in line with BPK 4.3a which states that the project site is suitable to be used as industrial area and is allowed for light, medium and heavy industries as shown in **Table 6.14** and the project site relation to Rancangan Tempatan Daerah Batu Gajah 2025 is shown in **Figure 6.20**.

Table 6.16: Schedule of Land Use Map Index BPK 4.3a

BPK 4.3 ZON INDUSTRI (ZI) SIMPANG PULAI

BPK	KELUASAN (HEKTAR)	RUJUKAN PELAN INDEKS				DENSITI (UNIT/HEKTAR)	NISBAH PLOT	KETINGGIAN (MAKSIMUM)
		NO. PELAN SYIT	M/S	NO. PELAN SYIT	M/S			
4.3a Zon Industri Berat dan Berisiko Tinggi (ZIBRT) Simpang Pulai	2,170.1	637-C 637-D 652-C 652-D	s-36 s-37 s-64 s-65	653-C 667-A 667-B 667-D	s-66 s-80 s-81 s-93	-	1:2	5
4.3b Zon Industri Kecil & Sederhana (IKS) Simpang Pulai	152.0	666-B 667-A	s-79 s-80			-	1:2	5

KOLUM I	KOLUM II	KOLUM III	KOLUM IV
KELAS/AKTIVITI UTAMA		4.3a	4.3b
JENIS GUNATANAH		ZIBRT	ZIKS
B PERINDUSTRIAN (1)			
B1 Industri Berisiko Tinggi	B	T	
B2 Industri Berat	B	T	
B3 Industri Sederhana	B	B	
B4 Industri Ringan	B	B	
B5 Industri Kafej	B	B	
A PERUMAHAN		T	

LAIN-LAIN SYARAT								
- Nisbah Plot & Kelengkapan Bangunan: <table border="1"> <tr> <th>Nisbah Plot</th><th>Kelengkapan Maksimum</th><th>Kawasan Plinth</th></tr> <tr> <td>1 : 2</td><td>5 tingkat</td><td>Tapak <1 ekar = 80%, Tapak >1 ekar = 60%.</td></tr> </table> - Mendapat kelulusan dan penentuan syarat-syarat dan persetujuan MDBG, agensi teknikal dan bukan teknikal yang berkaitan. - Menyediakan kemudahan infrastruktur dan utiliti yang secukupnya dan perlu mematuhi garis panduan dan piawaian yang diguna pakai oleh MDBG, agensi teknikal dan bukan teknikal yang berkaitan. - Zon Penempatan & Jenis Aktiviti Yang Dibenarkan - Rujuk <i>Guidelines for Siting and Zoning of Industry and Residential Areas, Department of Environment (Okt 2012)</i>. - Pembangunan mana-mana kawasan yang berpotensi untuk tujuan mineral hendaklah dibenarkan dengan syarat: (1) Mendapat kelulusan dan penentuan syarat-syarat dan persetujuan agensi teknikal dan bukan teknikal yang berkaitan. (2) Mendapat kelulusan Kebenaran Merancang (KM) perlombongan sebelum kerja-kerja perlombongan dijalankan. (3) Mendapat kelulusan daripada Jabatan Alam Sekitar dengan penyediaan Penilaian Awal Tapak (AS-PAT-12) dan Laporan Impak Alam Sekitar (EIA).			Nisbah Plot	Kelengkapan Maksimum	Kawasan Plinth	1 : 2	5 tingkat	Tapak <1 ekar = 80%, Tapak >1 ekar = 60%.
Nisbah Plot	Kelengkapan Maksimum	Kawasan Plinth						
1 : 2	5 tingkat	Tapak <1 ekar = 80%, Tapak >1 ekar = 60%.						

Source: Rancangan Tempatan Majlis Daerah Batu Gajah 2025

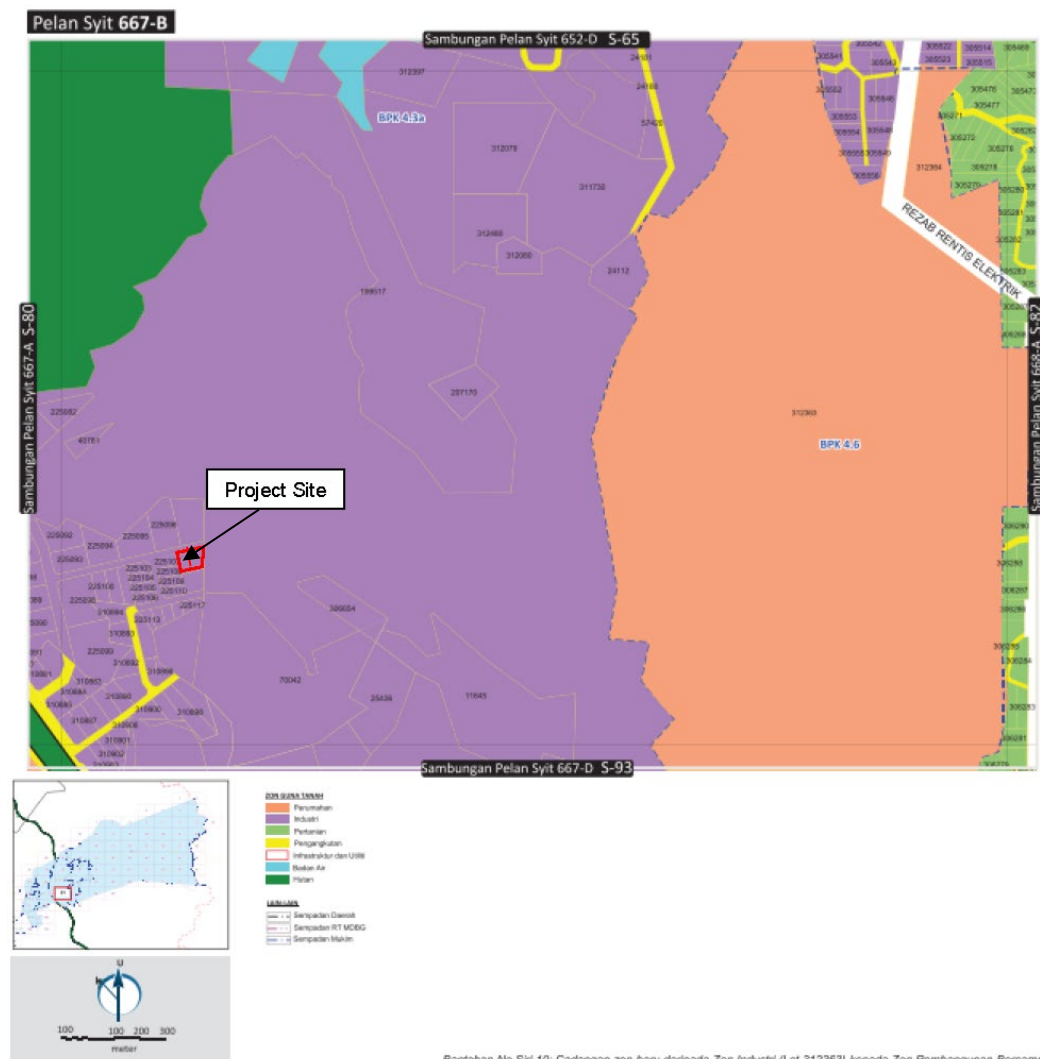


Figure 6.21: Project Location in Relation to RTDBG 2025

Source: Rancangan Tempatan Majlis Daerah Batu Gajah 2025 (Pelan Syit 667-D S-93)

6.4.5.4 Environmental Essentials for Sitting of Industries in Malaysia (ESSIM)

A review against the existing land use of the study area revealed that there is no residential area is recorded within the 250 m boundary of the Project site. The nearest settlement areas, namely Kampung Kurnia which are located within 0.93 km of Project boundary. According to the latest DOE Guidelines for Environmental Essentials for Sitting of Industries in Malaysia (EESIM) 2017, the buffer requirement to be maintained within the industries to the nearest sensitive receptor shall refer to the NPP-4 and related local plans. The Project is located outside of the protected area and water catchment area under NPP-4.

The Project site is located within the Kawasan Perindustrian Tungzen. At present, the Project site is located in Lot 225111, Mukim Sungai Raya and shall be operational entirely within the lot. In addition, the facility will be equipped with necessary mitigation measures such as an air pollution control system (APCS) to minimize the potential environmental issues. The site will be monitored regularly for water quality, air quality and ambient noise level. The proposed Project is therefore not in conflict and compatible with the existing activities at the surrounding land use.

6.4.6 Existing Infrastructure and Utilities

6.4.6.1 Water Supply

The estimated total water demand for the Project is 15 m³/day. The water supply for the study area is supplied by contractors and rainwater harvesting.

6.4.6.2 Electricity

The projected electricity (power) loading demand for the Project during operational phase is 200 KW. The electricity supply for the Project is the responsibilities of Tenaga Nasional Berhad (TNB).

6.4.6.3 Telecommunications

In general, there is no existing telecommunication system surrounding the area is provided.

6.4.6.4 Road Network

The Project site can be accessed through Lebuhraya Utara Selatan (PLUS) through Simpang Pulai Toll Plaza (Exit 137) to Route 1 / Jalan Ipoh - Kampar / Jalan Gopeng in Taman Pulau Jaya, Kampung Kepayang before reaching the proposed project site. The others alternative roads that can be used are also Route 1 / Jalan Ipoh - Kampar / Jalan Gopeng from Gopeng town were situated south of the proposed project site.

6.4.6.5 Sewage and Solid Waste

Sewage derived from the factory will be treated before being discharged into the receiving water body. Septic tanks have been provided at the Project site.

Solid waste generated from the Project site will be disposed of at the approved dumpsite operated by local authority.

6.4.6.6 Scheduled Wastes

Scheduled wastes derived from the operation such as used oils, oil filters, used drums, used containers, rags, etc. shall be disposed of at DOE approved prescribed premise for offsite scheduled waste recovery and disposal.

6.5 SOCIO-ECONOMIC STUDY

The current human environment formed and shown is very important to evaluate. The current socio-economic impact study is a step to assess the impact and reaction of the population to the proposed project. The consideration given to community or socio-economic characteristics within the corridor radius of the study area is based on the understanding that although socio-economic effects can affect distant or borderless areas, only the residents of the immediate environment will bear the direct impact, if there is, because of the close distance to the project site. In addition, the views of the nearby local community need to be considered to ensure that the implemented project is well received and socially balanced.

6.5.1 Background of the Study Area

The Project area is not classified as an environmentally sensitive area (ESA) in the National Physical Plan 4 and Rancangan Struktur Negeri (RSN) Perak 2040. The project area located in Perak is classified as Heavy Industries in the Rancangan Struktur Negeri (RSN) Perak 2040. The Project concept will reduce the introduction and accumulation of rubber tire wastes which otherwise will be detrimental to the environment and society. The Project is to develop and establish a solid waste recovery facility (pyrolysis plant) complete with air pollution control system (APCS) and noise emission control system. The Project is based on the concept of recovery of beneficial materials namely pyrolysis oil and rubber with purpose of rubber tire waste recovery while minimizing the adverse impacts to the environment. Solid waste recovery will give direct benefit to the general public of Perak State and at the same provides economic benefits to the locals through job opportunities and other trading and commercial activities.

6.5.2 Methodology of the Study

Data and information for this study were obtained from two main sources. First, data was collected, and information is organized from secondary sources, which are published and unpublished reports on the local human environment in the study area. Published data such as Population Census Data can only provide information up to the area of the smallest administrative unit, which is mukim only. Thus, no detailed information is available for this study at the household level let alone for the study area, which is aligned and specific.

Detailed demographic and socio-economic data as well as data on perception, awareness and evaluation of the project by affected population groups need to be produced or generated. Data generation can be done by conducting a social questionnaire, which not only the background of the people in the area can be known but more importantly, their views and evaluation of the proposed project in question. Their views and evaluation of project proposals are important because they are stakeholders or stakeholders who will be directly affected by the project that will be implemented.

This study is not aimed at the general population but at the head of the household because they are usually the decision makers for the family. Assuming that each house accommodates one household, then the number of houses in the study area. The statistical population is determined by determining the number of housing units/buildings using calculations from information obtained from the village head himself.

A social survey using random sampling and head of household as a respondent selection technique was used to collect the data and information required by this study.

With the ease of calculating the sample size using a special calculator (sample size calculator), the sample size of the head of household that has been calculated with statistical population input, a confidence level of 95% and a margin error of 5% is 300 respondents interviewed in the field. If the head of the household is not at home, the wife or child (must be 18 years old or older) will represent the head of the household. **Table 6.15** shows the total distribution of respondents according to the settlement sample in the 1 to 5 km corridor of the proposed project radius where there are 7 settlements. The survey conducted is based on a set of questionnaires that contain questions and the collection of information required by this study such as the social background of the community, perceptions and attitudes towards this project proposal. In addition, to enabling the collection of the necessary information, this social survey also ensures participation and can gather input from the public in making decisions at the initial stage of the project. Therefore, social survey became the main method of data collection for this study. It involves a public opinion poll collected through a questionnaire to the general public (head of household) in the study area. The survey was conducted in August 2023 (14 – 20).

Table 6.17: Distribution of Respondents

Kampung / Taman	Bil	Radius (km)
Radius 0 – 3 km		
Kampung Tersusun Tekah Baru / Kampung Tekah	58	1 – 3
Taman Seri Raia	40	1 – 3
Kg. Kurnia	28	1 – 3
Kg. Kepayang	32	1 – 3
Taman Raia Mesra	42	1 – 3
Total	200	
Radius 3 – 5 km		
Taman Gopeng	10	3 – 5
Taman Raia Indah	10	3 – 5
Kg. Pengkalan Baharu	20	3 – 5
Kg. Sungai Ular	20	3 – 5
Taman Muda	18	3 – 5
Kg. Simpang Pulai	22	3 – 5
Total	100	
Cumulative Total	300	1 – 5

Source: Field Data, August 2023

6.5.3 Respondent's Background or Profile

Community or respondent profiles are needed to help identify residents in the study area. It is usually the type or form of a community that determines the reaction, impact and level of community acceptance in the concerned area. Analysis of the data collected from the questionnaire survey includes community profiles including demographics, social and economic characteristics, as well as respondents' perceptions and opinions.

6.5.3.1 Demographic Profile

The data shows that the Malay ethnic group in the study area is the majority which is 73.33% followed by the Chinese ethnic group (22.67%) and the Indian ethnic group comprising 4% of the group.

The table provided shows the age distribution of respondents in different age groups. The breakdown is as follows, age group 20 to 29 (7.67%), age group 30 to 39 (30.67%), age group 40 to 49 (32.67%), age group 50 to 59 (17.33%) and age group over 60 years old (11.67%). This data gives an overview of the age distribution of the respondents. The majority of them are in the age range of 30-49 years old. The median age of the respondents is 45 years old. It shows that the majority of respondents are from the young age group consisting of adults.

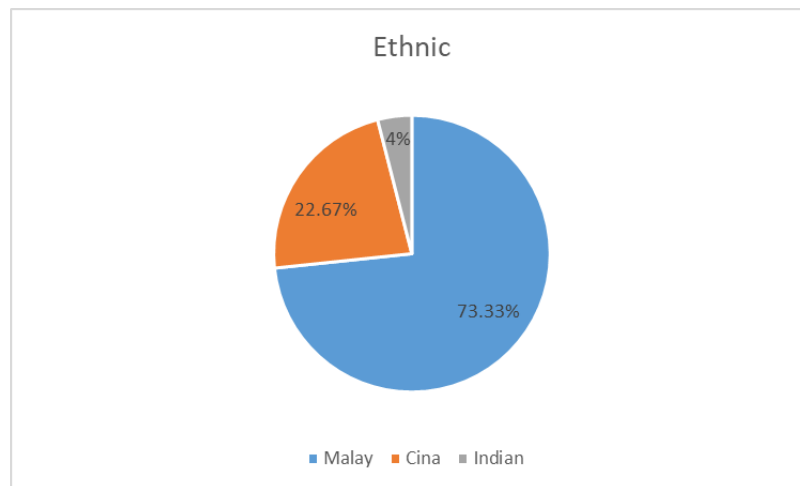


Figure 6.22: Ethnic Distribution of Respondents

Source: Field Data, August 2023

Table 6.18: Age Group Distribution of Respondents

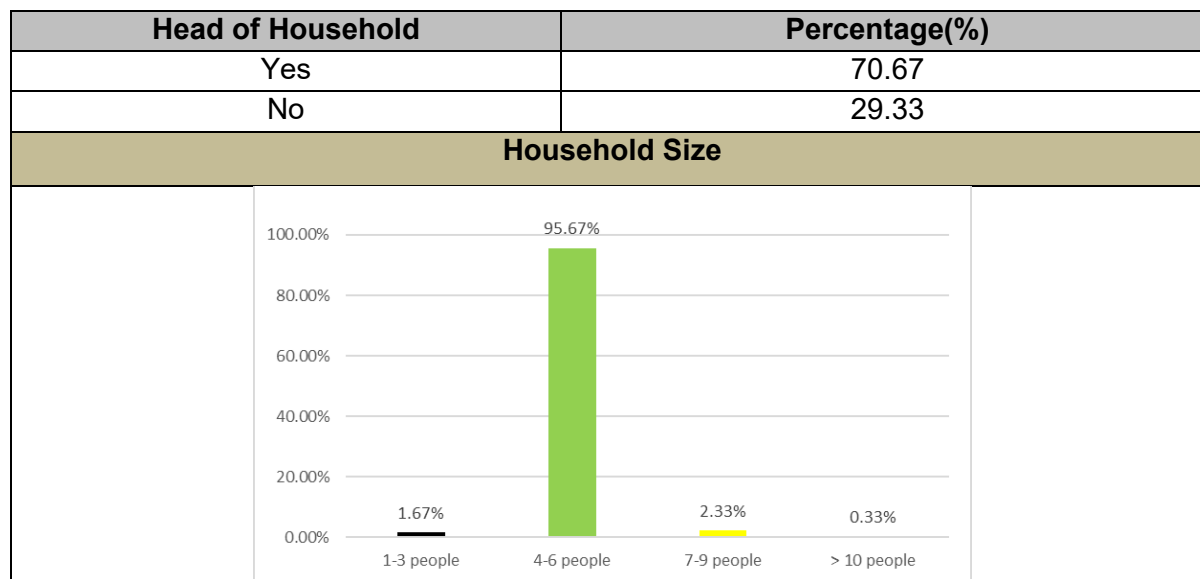
Age Group	Percentage (%)
20-29	7.67
30-29	30.67
40-49	32.67
50-59	17.33
>60	11.67

Source: Field Data, August 2023

Figure 6.22 shows the characteristics of households and household members of respondents who were surveyed. The number of heads of households that were interviewed was 70.67% and non-head of households was 29.33%, where either the wife or child represented to be interviewed. Based on the findings of the study, the majority of households have 4 to 6 people in family, which is 95.67% followed by 7 to 9 people (2.33%).

While 1 to 3 people and 10 people and above in one family by 1.67% and 0.33% respectively. The average household size in the study area was found to be 6 people per household.

Figure 6.23: Characteristics of the Respondent's Household and Household Members



Source: Field Data, August 2023

6.5.3.2 Socio-economic Profile

Table 6.17 shows the respondent's educational background. The table provided shows the distribution of the education level of the respondents. Here are the details: 156 respondents, 52.0% of the total, have completed upper secondary education. 120 respondents, comprising 40.0% of the total, have a diploma or institution-based education. Whereas, 24 respondents, representing 8.0% of the total, have a college or university education i.e., a bachelor's or master's degree.

Table 6.19: Respondent's Education Level

Education Level	Number	Percentage (%)
No Formal Schooling	-	-
Primary School	-	-
Lower Secondary	-	-
Upper Secondary	156	52.0
Diploma/Institution	120	40.0
College/University	24	8.0

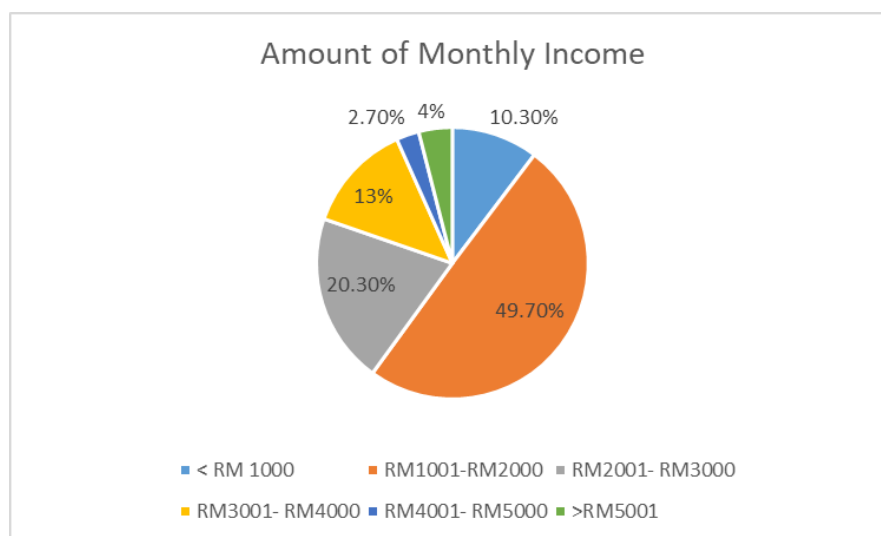
Source: Field Data, August 2023

Next, **Table 6.18** shows the employment and income profile. In terms of employment, respondents in the study area working in the public sector accounted for 11.0% whereas the private sector comprises 41.7% of the total. Respondents working in business jobs or small traders accounted for 17.3% while 6.7% are unemployed. Other than that, 5.0% work in agriculture, 3.3% does village work, including building houses and selling farm produce. Drivers comprises of 4.3% whereas 1.0% work as security guards. There are 12 respondents (4.0%) who have retired while respondents with other jobs represent 5.7%. **Figure 6.23** shows that respondents in the study area have 6 categories of household income which is the majority income of RM 1001-RM 2000 followed by income of RM 2001-RM 3000 and RM 3001-RM 4000. Income less than RM 1000 comprises of 10.3% followed by income of more than RM 5000 and RM 4001-RM 5000. This information provides insight into the distribution of income among households and can help in planning policies and related social programs to meet the needs of the population.

Table 6.20: Respondent's Employment Profile

Type of Occupation	Number	Percentage (%)
Public Sector Employees	33	11.0
Private Sector Employees	125	41.7
Businessmen / Petty Traders	52	17.3
Not Working	20	6.7
Farmers	15	5.0
Village Work (Homemaker, Selling Farm Produce)	10	3.3
Drivers	13	4.3
Security Guard	3	1.0
Retirees	12	4.0
Others	17	5.7

Source: Field Data, August 2023

Figure 6.24: Respondent's Income Profile

Source: Field Data, August 2023

6.5.4 Housing, Ownership and Current Condition

This study also considers that information about the type of residence, ownership and condition of the house that the respondents live in needs to be known. **Table** shows the findings of the study which show the length of time respondents resided in the study area. The results of the analysis show that the length of stay of respondents who reside in the study area is more than 10 years (86%) followed by 5-10 years which is 13.3%. The placement period from 1 year to 3 years is only 0.7%. Most respondents (86%) live in owner-occupied homes. Other than that, 60% of respondents live in village-type houses whereas 40% live housing estates, whether one-story or two-story.

To give some indication of the respondents' standard of living, the survey also recorded household access to basic amenities, vehicle ownership and modern household goods. While the type of house occupied by all respondents is a village type house (100%). The residences are mostly in good condition, with 100% enjoying electricity, clean water and good toilet facilities.

Table 6.21: Housing, Ownership and Conditions

Category	Percentage (%)	
Length of Stay (Years)		
Less than 1 year	-	
1 – 3 years	0.7	
3 – 5 years	-	
5 – 10 years	13.3	
More than 10 years	86.0	
Home Ownership		
Rent	-	
Self-owned	86.0	
Family owned	14.0	
Type of House		
Terrace 1 / Terrace 2	40.0	
Village	60.0	
Type of Household Items	Yes (%)	No (%)
Motorcar	92.3	7.7
Van	9.7	90.3
Lorry	9.3	90.7
Motorcycle	96.0	4.0
Bicycle	25.3	74.7
Television	99.7	0.3
Radio	100.0	0.0
Air conditioner	18.3	81.7
Refrigerator	100.0	0.0
Fan	100.0	0.0
Sofa	100.0	0.0
Gas cooker	100.0	0.0
Electrical appliances	100.0	0.0

Source: Field Data, August 2023

CHAPTER 7

EVALUATION OF IMPACTS

CHAPTER 7 : EVALUATION OF IMPACTS

7.1 INTRODUCTION

This Chapter discusses the environmental components likely to experience potentially significant impacts due to the Project. The potential impacts identified are:

During the operational phase:

- (i) Water pollution
- (ii) Air pollution
- (iii) Noise pollution
- (iv) Hazard / Safety Risk
- (v) Waste generation
- (vi) Increased traffic in the area

The aim of this Chapter is to highlight all the activities that have potential significant impact on the environment and health & safety on workers and the public (**Table 7.1**). The potential impacts caused by the various activities during Project implementation are shown in a matrix form. The following qualitative scoring system will be adopted to denote the seriousness of such impact:

Type of Impact

- + Positive/beneficial impact
- Negative/adverse impact

Duration of impact

- S Short term effect anticipated (< 1 year)
- M Medium term effect anticipated (1 - 5 years)
- L Long term effect anticipated (> 5 years)
- N No impact

Significance

- 0 Not significance
- 1 Minor significance
- 2 Moderate significance
- 3 Major significance

Table 7.1: Activities Undertaken for the Development and their Potential Impacts

Activities	Remarks	Potential Impacts	Significant
During Operational Phase			
Installation, assembly, testing and commissioning equipment / machinery	All equipment / machinery such as pyrolysis reactor, crusher, etc. will be installed, tested and commissioned once renovation activities are completed.	• Minimal dust generation • Minimal noise impact	- S1 - S1
Operation of recovery facility	Details of the Project components refer to Section 5.3. The operation activities of the recovery plant include: - Handling and transportation of raw materials such as rubber tire wastes, plastic wastes, decanter sludge and POME sludge. - Sorting and storage of raw materials. - Feeding of feedstock (selected materials prepared in batches) into pyrolysis reactor, crusher and wire stripper. - Pyrolysis and condensation of raw materials into finished goods via pyrolysis reactor and condenser. - Transferring of gaseous emissions formed during the pyrolysis and condensation process into wet scrubber and flaring chamber.	• Air pollution • Noise pollution • Spillage of scraps or raw materials • Water pollution • Safety risk / hazard • Waste generation • Increased traffic in the area • Employment opportunity	- S2 - S1 - L1 - L1 - S2 - S1 - L1 + L2

	- Handling and storage of finished products (refined oil, carbon black, steel wires). The Project expected to create directly and indirectly job and business opportunities during the operational phase.		
Maintenance of building, facilities and utilities	The facility shall be maintained from time to time, which includes the following: - Flaring chamber (APCS 1) and wet scrubber (APCS 2) shall be maintained from time to time with proper inspections. - Solid wastes generated will be collected and transported to a designated landfill by local authority licensed contractor. - Scheduled wastes (such as used oil, sludge, etc.) will be sent to Kualiti Alam (KA) or other licensed recovery premises for safe disposal.	• Employment opportunity • Water pollution • Air pollution • Waste generation • Risk to worker's health and safety	+ S1 -S1 - S1 - S1 - S1

Note: (S) – Short-term (M) – Medium term (L) – Long-term (N) – No impact

(0) – No significance (1) – Little significance (2) Moderate significance (3) Major significance

(+) – Beneficial (-) - Adverse

Table 7.2: Matrix of Activities and Impacts during Operation Phase

Possible Impacts			Activities	
			Operation of Recovery Facility	Maintenance of Building, Facilities and Utilities
Physical Environment	Water	Water quality	-L1	-S1
		Increased surface drainage	-S1	-S1
	Atmosphere	Gaseous / dust emission	-S2	N
		Noise emission	-S1	-S1
	Land	Soil erosion	N	N
		Siltation and sedimentation	N	N
		Leakage from machinery	-S1	-S1
Biological Environment	Terrestrial	Loss of vegetation	N	N
		Loss of natural habitat	N	N
Social Environment	Socio-Economic	Employment generation	+L2	+S1
		Property value	+L1	+L1
	Health and Safety	Traffic congestion	-L1	-S1
		Health hazards	-L1	-S1
		Fire hazards	-S1	N
		Accident risk	-S2	-S1
	Aesthetics	Aesthetic value	+L1	+L1

Note: (S) – Short-term (M) – Medium term (L) – Long-term (N) – No impact

(1) – No significance (1) – Little significance (2) Moderate significance (3) Major significance

(+) – Beneficial (-) - Adverse

7.2 WATER QUALITY

Since the process involved in the refined oil production does not require water, hence there is no wastewater generated. Water quality is not affected by the activities carried out on the Project site.

7.3 AIR QUALITY

7.3.1 Air Quality During Operational Phase

In this proposed refined oil manufacturing project, the rubber tire wastes will be subjected to the processes of screening, wire stripping, crushing, pyrolysis, condensation, storage and drumming whereas the plastic wastes will be subjected to the processes of screening, pyrolysis, condensation, storage and drumming. On the other hand, decanter sludge and POME sludge will be subjected to the processes of screening, blending, pyrolysis, condensation, storage and drumming.

7.3.1.1 Screening

All raw materials entering the pyrolysis facility will undergo the process of screening against the established Waste Acceptance Criteria (WAC). The process will be carried out manually by factory workers. Materials that do not meet the established WAC will be returned to the respective suppliers.

7.3.1.2 Wire Stripping

Rubber tire wastes will undergo the process of wire stripping. This is to strip of steel wires from the tires before transferring them into the crusher machine. The steel wires will be stored and later, sold to recycling facilities.

7.3.1.3 Crushing

Rubber tire wastes that have underwent the wire stripping process will be crushed in the crusher machine to produce rubber crumbs as a preparation feedstock for the pyrolysis reactor.

7.3.1.4 Blending

Decanter sludge and POME sludge that has underwent the screening process will be blended respectively using a blending equipment as a preparation feedstock for the pyrolysis reactor.

7.3.1.5 Pyrolysis

All raw materials will be subjected to the process of pyrolysis. The materials will be pyrolyzed in the absence of oxygen, where it will decompose through heating to a high temperature. Carbon black and pyrolysis vapour will be formed in this process.

7.3.1.6 Condensation

Pyrolysis vapour that was formed during the pyrolysis process will be transferred into a main condenser via a condensing pipe. Refined oil (pyrolysis oil) will be formed from the condensation of the pyrolysis vapour.

7.3.1.7 Storage

Refined oil will be stored in metal or plastic storage tanks whereas carbon black and steel wires will be packaged and stored in their respective storage areas. This process will be carried out manually by the factory workers.

7.3.1.8 Drumming

Refined oil will be transferred into steel or plastic drums before being sold to buyers. This process will be carried out manually by the factory workers.

7.3.2 Emissions

The principal pollutant emitted from fuel oil manufacturing processes and engineering works may result in emissions of particulate matters, nitrogen oxide and sulfur dioxide. These emissions are expected to be released mainly from chimney after air stream filtration through air pollution control system (APCS).

Apart from that, fugitive emissions occur from each process associated with mechanical and engineering works, in the form of dusts.

Besides emissions from the boiler operations, fuel burning equipment are used for heating. Emissions from the fuel burning equipment are mainly from the combustion of fuel oil.

Emissions from fuel combustion depend on the grade and composition of the fuel, the type and size of the heater, the firing and loading practices used, and the level of equipment maintenance. In general, the baseline emissions of criteria and non-criteria pollutants are those from uncontrolled combustion sources. Uncontrolled sources are those without add-on air pollution control system (APCS) equipment or other combustion modifications designed for emission control.

Particulate matter (PM) emissions depend predominantly on the types of fuel fired. Combustion of lighter fuel results in significantly lower PM formation than does combustion of heavier fuels.

Sulphur dioxide (SO₂) emissions are generated during fuel combustion from the oxidation of sulphur contained in the fuel. The emissions of SO₂ from conventional combustion systems are predominantly in the form of SO₂.

Oxides of nitrogen (NO_x) formed in combustion processes are due either to thermal fixation of atmospheric nitrogen in the combustion air ("thermal NO_x"), or to the conversion of chemically bound nitrogen in the fuel ("fuel NO_x"). The term NO_x refers to the composite of nitric oxide (NO) and nitrogen dioxide (NO₂).

7.3.3 Modelling

The air quality impact assessment was conducted in accordance with USEPA Guideline on Air Quality Models (GAQM; as incorporated in Appendix W of 40 CFR Part 51). The guideline recommends a three-phase approach which are as follows;

Phase 1. Apply a simple screening procedure to determine if either (1) the source clearly poses no air quality problem or (2) the potential for an air quality problem exists.

Phase 2. If the simplified screening results indicate a potential threat to air quality, further analysis is warranted, and the detailed screening (basic modelling) procedures should be applied.

Phase 3. If the detailed screening results or other factors indicate a problem, then a more refined analysis is necessary.

Refined analysis was conducted as air pollution is a concern. It should be noted that the USEPA promulgated a revision to the Guideline on Air Quality Models (GAQM) on November 9, 2005 and the revised version of GAQM adopts AERMOD as the preferred dispersion model.

Dispersion modelling was conducted with the USEPA's AERMOD model (Version 16216, Released Dec. 2016 and one year of meteorological data generated by the Mesoscale Meteorological Model (MM5). This one-year data set was processed with AERMET (Version 16216, Released Dec., 2016), the meteorological processor for AERMOD, in accordance with guidance provided by USEPA in the recently revised AERMOD Implementation Guide (AIG; USEPA, March 19, 2009) and Notes (USEPA, Released June 2014).

For suspended particulate matter, PM₁₀ and PM_{2.5}, SO₂ and NO₂, two possible scenarios, with control measures and without control measures are simulated by refined modelling. In the case of dioxins and furans, a scenario based on the emission standard for dioxins and furans in waste incineration is simulated.

The predicted concentrations of PM₁₀, SO₂, NO₂ and PM_{2.5} were assessed with air quality limits established by the 2020 Malaysian Ambient Air Quality Guidelines (MAAQG) shown below;

Table 7.3: Malaysian Ambient Air Quality Guidelines, 2020
(at 273 K and 101.13kPa)

Pollutant	Average Time	Unit	Standard (2020)
PM ₁₀	24-hour	µg/m ³	100
	Annual		40
PM _{2.5}	24-hour	µg/m ³	35
	Annual		15
Sulphur dioxide	1-hour	µg/m ³	250
	24-hour		80
Nitrogen dioxide	1-hour	µg/m ³	280
	24-hour		70
Carbon monoxide	1-hour	mg/m ³	30
	8-hour		10
Ozone	1-hour	µg/m ³	180
	8-hour		100

7.3.4 Air Quality Prediction Model

AERMOD is a refined dispersion model for simple and complex terrain for receptors within 50 km of a modelled source. AERMOD is a steady-state plume model. In the stable boundary layer (SBL), it assumes the concentration distribution to be Gaussian in both the vertical and horizontal. In the convective boundary layer (CBL), the horizontal distribution is also assumed to be Gaussian, but the vertical distribution is described with a bi-Gaussian probability density function (pdf). Additionally, in the CBL, AERMOD treats “plume lofting,” whereby a portion of plume mass, released from a buoyant source, rises to and remains near the top of the boundary layer before becoming mixed into the CBL. AERMOD also tracks any plume mass that penetrates into the elevated stable layer, and then allows it to re-enter the boundary layer when and if appropriate. For sources in both the CBL and the SBL, AERMOD treats the enhancement of lateral dispersion resulting from plume meander. AERMOD incorporates current concepts about flow and dispersion in complex terrain. Where appropriate the plume is modelled as either impacting and/or following the terrain, thus AERMOD removes the need for defining complex terrain regimes. All terrain is handled in a consistent and continuous manner while considering the dividing streamline concept in stably stratified conditions.

7.3.5 Source Parameters

Emissions from the pyrolysis of organic materials are channeled to air pollution control systems (APCS) consisting of scrubber system before the exhaust gases are released into the atmosphere.

Table 7.4: Source Parameters of APCS

Lot	Stack of Pyrolysis Machine
Type of Industry	Medium - Heavy
Source Parameters	APCS – Wet Scrubber
Stack height (m)	15.0
Stack diameter (m)	0.6
Gas exit temperature (K)	373
Gas exit velocity (m/s)	15.0

7.3.6 Emission Rate

The emission rate of PM₁₀, PM_{2.5}, SO₂ and NO₂ are computed based on the maximum capacity of the schedule wastes recovery facility.

7.3.7 Particulate Matter PM₁₀ and PM_{2.5}

PM₁₀ Scenario

Two emission rates of PM₁₀ are modelled in the impact assessment. The first is the "with control measures" emission rate and the second the "without control measures" emission rate. The emission rate of PM₁₀ is computed based on the emission concentration standards of the newly gazetted Department of Environment, Malaysia Clean Air Regulations 2014 (DOE, CAR 2014) Third Schedule [Regulation 13], Limit Values and Technical Standards (By Activity or Industry).

- i) With control measures

Table 7.5: Source Parameters with Control Measures for PM₁₀ Scenario

Source Parameters	APCS – Wet Scrubber
Required Emission Standard (mg/Nm ³)	50
Flow volume (m ³ /s)	4.241
Emission rate (g/s)	0.212

- ii) Without control measures

The emission rate of PM₁₀ when there are no control measures is computed based on the APCS removal efficiency of 99% as dust collectors and bag filters are employed to remove particle matter emissions.

Table 7.6: Source Parameters without Control Measures for PM₁₀ Scenario

Source Parameters	APCS – Wet Scrubber
Required Emission Standard (mg/Nm ³)	50
Flow volume (m ³ /s)	4.241
Emission rate (g/s)	10.603

PM_{2.5} Scenario

Two emission rates of PM_{2.5} are modelled in the impact assessment. The first is the "with control measures" emission rate and the second the "without control measures" emission rate. The emission rate of PM_{2.5} is computed based on the 60% of the PM₁₀ emission concentration are from PM_{2.5} category.

- i) With control measures

Table 7.7: Source Parameters with Control Measures for PM_{2.5} Scenario

Source Parameters	APCS – Wet Scrubber
Required Emission Standard (mg/Nm ³)	50
Flow volume (m ³ /s)	4.241
Emission rate (g/s)	0.127

ii) Without control measures

The emission rate of $PM_{2.5}$ when there are no control measures is computed based on the APCS removal efficiency of 99% as dust collectors and bag filters are employed to remove particle matter emissions.

Table 7.8: Source Parameters without Control Measures for $PM_{2.5}$ Scenario

Source Parameters	APCS – Wet Scrubber
Required Emission Standard (mg/Nm^3)	50
Flow volume (m^3/s)	4.241
Emission rate (g/s)	6.326

7.3.8 Sulphur Dioxide

The emission rate of SO_2 is also based on the Malaysia Clean Air Regulations 2014 (DOE, CAR 2014) Third Schedule [Regulation 13], Limit Values and Technical Standards (By Activity or Industry), Part D. With SO_2 being released from APCS1 to APCS13 releases. The emission rate of SO_2 from these emission sources shall comply to following standards:

- 1) Compliant scenario (maintain at $400mg/Nm^3$) for all chimneys with SO_2 releases

7.3.9 Nitrogen Dioxide

The emission rate of NO_2 is also based on the Malaysia Clean Air Regulations 2014 (DOE, CAR 2014) Third Schedule [Regulation 13], Limit Values and Technical Standards (By Activity or Industry), Part D. With NO_2 being released from APCS1 to APCS13 releases. The emission rate of NO_2 from these emission sources shall comply to following standards:

- 1) Compliant scenario (maintain at $500mg/Nm^3$) for all chimneys with NO_2 releases

7.3.10 Receptor Grid System

In order to simulate the impact of emissions from ground and elevated sources, receptors must be chosen, and ground level ambient concentrations determined for each of the receptor locations. Ground elevation at each receptor point is obtained from available topographical maps of the area.

In this particular assessment, a 6 X 6 km cartesian grid (3-km radius) with 100 meters spacing was used for the impact modelling. Center point of project site is chosen as the origin of the receptor grid

7.3.11 Sensitive and Discrete Receptors

To better assess the impact of air pollution, sensitive and discrete receptors are identified in the receptor grid. The nearest sensitive receptors identified are i) Taman Seri Raia to the west, ii) Nearest house at Kampung Tekkah to the south, and iii) Auasia Nutriculture to the northeast. These three receptors are also the baseline air quality monitoring sites A2, A3 and A4 respectively. Geographical coordinates of these sensitive and discrete receptors are as follows:-

Table 7.9: Sensitive and Discrete Receptors

Receptor	Coordinate		Direction
	Latitude	Longitude	
Project Boundary, A1	4°30'44.4"N	101°08'54.6"E	N
Nearest Shophouse at Taman Seri Raia, A2	4°30'38.6"N	101°08'24.7"E	W
Nearest House at Kg. Tekkah, A3	4°30'05.6"N	101°08'48.6"E	S
Entrance at Auasia Nutriculture (Agro-based Industry), A4	4°30'53.3"N	101°09'04.0"E	NE

Air pollutant concentrations at these receptors are predicted in the study.

7.3.12 Meteorological Data

Accurate air quality modelling is highly dependent on the quality of the meteorological and emission data used. Consequently, the best available and most representative data was used to allow for minimal margin for error in the modelling.

One year of meteorological data generated by the Mesoscale Meteorological Model (MM5) for the site which is near the Kuala Lumpur International Airport. Principal Meteorological Station operated by the Malaysian Meteorological Department was used in the modelling.

The latest version of the AERMET meteorological pre-processor (Version 19191) was used to process the data required for AERMOD. Boundary layer parameters used by AERMOD, which are required as input to the AERMET processor, include albedo, Bowen ratio, and surface roughness. These parameters were determined by examining a 3km radius area surrounding the project site in accordance with current USEPA guidance. Based on the land use classification, site-specific values of surface roughness, albedo, and Bowen ratio was obtained from the AERMET user's guide (USEPA 1998) for appropriate sectors around the site.

The upper air data generated by the MM5 Model was processed to assign 00 Greenwich Mean Time (GMT) to a time near local sunrise that is needed by the meteorological pre-processor, AERMET.

7.3.13 Dispersion Options

AERMOD is especially designed to support the regulatory modelling assessments. The regulatory modelling options were selected for the mode of operation for the model. These include the use of stack-tip downwash, buoyancy-induced dispersion, final plume rise, routine for processing averages when calm winds occur, values for wind profile exponents and for the vertical potential temperature gradients.

The application of the model requires characterization of the local (within 3km) dispersion environment as either urban or rural, based on a USEPA-recommended procedure that characterizes an area by prevalent land use. This land use approach classifies an area according to 12 land use types. In this scheme, areas of industrial, commercial, and compact residential land use are designated urban. According to USEPA modelling guidelines, if more than 50 percent of an area within a 3km radius of the proposed facility is classified as rural, then rural dispersion coefficients are to be used in the dispersion modelling analysis. Conversely, if more than 50% of the area is urban, urban dispersion coefficients are used.

For this analysis, visual inspection of aerial photography shows that the 3km area surrounding the proposed facility is predominantly urban surrounded by some vegetation. Thus for this assessment, the urban option was selected.

7.3.14 Model Output

The types of output available with the model are:

- i). Summaries of high values (highest, second highest, etc.) by receptor for each averaging period and source group combination;
- ii). Summaries of overall maximum values for each averaging period and source group combination and
- iii). Tables of concurrent values summarized by receptor for each averaging period and source group combination for each day of data processed.

In this assessment, the maximum incremental concentration for the period is computed. This means that for the 24-hour average concentration, the maximum 24-hour average concentration is the highest computed 24-hour average concentration over the entire meteorological data period.

In the case of the long-term average or the seasonal average concentration, the computed average concentration is the average of all the hourly concentration over the entire meteorological data period.

7.3.15 Output Parameters

One set of output parameters are predicted, this is to determine compliance of the criteria pollutants as required in the 2013 Malaysian Ambient Air Quality Guidelines (MAAQG).

The set of output parameters are;

- i) Particulate matter PM10
 - a) Maximum 24-hour average concentration
 - b) Annual average concentration
- ii) Particulate matter PM2.5
 - a) Maximum 24-hour average concentration
 - b) Annual average concentration
- iii) Sulphur dioxide
 - a) Maximum 1-hour average concentration
 - b) Maximum 24-hour average concentration

- iv) Nitrogen dioxide
 - a) Maximum 1-hour average concentration
 - b) Maximum 24-hour average concentration

7.3.16 Results

Gaseous and dust pollutants assessed in this air quality assessment are particulate matter PM₁₀, PM_{2.5}, sulphur dioxide, and nitrogen dioxide.

7.3.16.1 Particulate Matter PM₁₀

Particulate matter PM₁₀ emissions from the air pollution control systems (APCS) of the schedule wastes facility is not expected to be significant as long as dust emissions from the manufacturing processes are removed with control measures.

Figure 7.1 shows the maximum 24-hour average PM₁₀ incremental concentration which is between 0.5 ug/m³ at the western and southwestern edge of the receptor grid approximately 3 km away and 10.0 ug/m³ at the project site boundary. With the insignificant incremental concentration and existing base line PM₁₀ concentrations at the monitoring sites, the resulting predicted ambient air PM₁₀ concentrations are below the MAAQG limit of 100 ug/m³.

Predicted annual average incremental concentration as shown in **Figure 7.2** is below 1.0 ug/m³ when there are dust control measures in operation. These concentrations are deemed negligible and when added to the existing baseline concentrations at the monitoring sites, the resulting ambient air concentration is below the MAAQG annual average limit of 40 ug/m³. Predicted PM₁₀ concentrations at the nearest sensitive receptors when there are control measures are well below the MAAQG limit as well.

Tabulated below are the predicted maximum 24-hour average and annual average PM₁₀ concentration in ug/m³ at the sensitive and discrete receptors when there are dust control measures.

Table 7.10: Predicted Maximum 24-hour Average and Annual Average PM₁₀ Concentration with the Presence of Dust Control Measures

Receptor	Existing baseline	Incremental		Ambient air	
		24-hour average	Annual average	24-hour average	Annual average
Project Boundary, A1	32	2.5	0.1	34.5	-
Nearest Shophouse at Taman Seri Raia, A2	24	5.1	0.1	29.1	-
Nearest House at Kg. Tekkah, A3	21	0.7	0.0	21.7	-
Entrance at Auasia Nutriculture (Agro-based Industry), A4	30	2.5	0.0	32.5	-
MAAQG for PM ₁₀				100	40

MAAQG : Malaysian Ambient Air Quality Guidelines

In the case when there are no dust control measures, modelling based on this scenario showed the predicted PM₁₀ concentrations are higher and the highest maximum 24-hour average incremental concentration is 250 ug/m³ near the project site decreasing to 10 ug/m³ approximately 3 km away. When added to the baseline concentrations at the monitoring sites, the resulting ambient air concentrations are above the maximum 24-hour average MAAQG limit of 100 ug/m³ in areas up to 2 km away from the project site. Contours of the maximum 24-hour average incremental concentration are shown in **Figure 7.3**.

In the event, control measures are not restored over a long period of time, the predicted annual average PM₁₀ incremental concentration is between 5 ug/m³ at the western and southwestern edge of the grid and 150 ug/m³ at the project boundary. When added to the existing baseline concentrations, the annual average PM₁₀ concentration is above the MAAQG limit of 40 ug/m³. Contours of the predicted annual average incremental concentration are shown in **Figure 7.4**.

Tabulated below are the predicted maximum 24-hour average and annual average PM₁₀ concentration in ug/m³ at the sensitive and discrete receptors when dust control measures fail.

**Table 7.11: Predicted Maximum 24-hour Average and Annual Average PM₁₀
Concentration without the Presence of Dust Control Measures**

Receptor	Existing baseline	Incremental		Ambient air	
		24-hour average	Annual average	24-hour average	Annual average
Project Boundary, A1	32	101.9	1.9	133.9	-
Nearest Shophouse at Taman Seri Raia, A2	24	265.0	1.8	289.0	-
Nearest House at Kg. Tekkah, A3	21	11.5	0.3	32.5	-
Entrance at Auasia Nutriculture (Agro-based Industry), A4	30	29.9	1.5	59.9	-
MAAQG for PM10				100	40



Figure 7.1: Maximum 24-hour Average PM₁₀ Incremental Concentration (ug/m³) With Control Measures, CAR Limits of 50 mg/m³

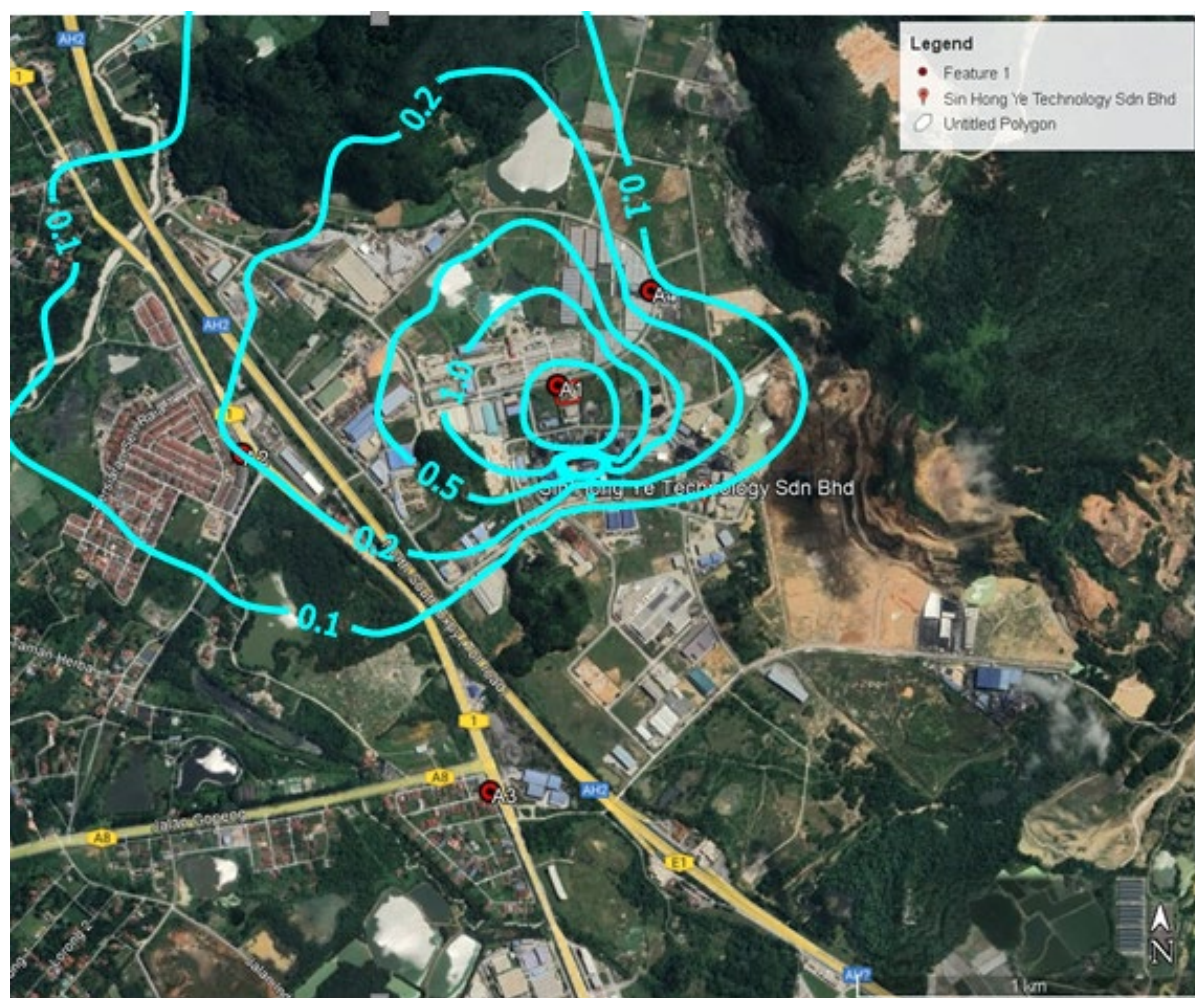


Figure 7.2: Annual Average PM₁₀ Incremental Concentration (ug/m³) With Control Measures, CAR Limits of 50 mg/m³

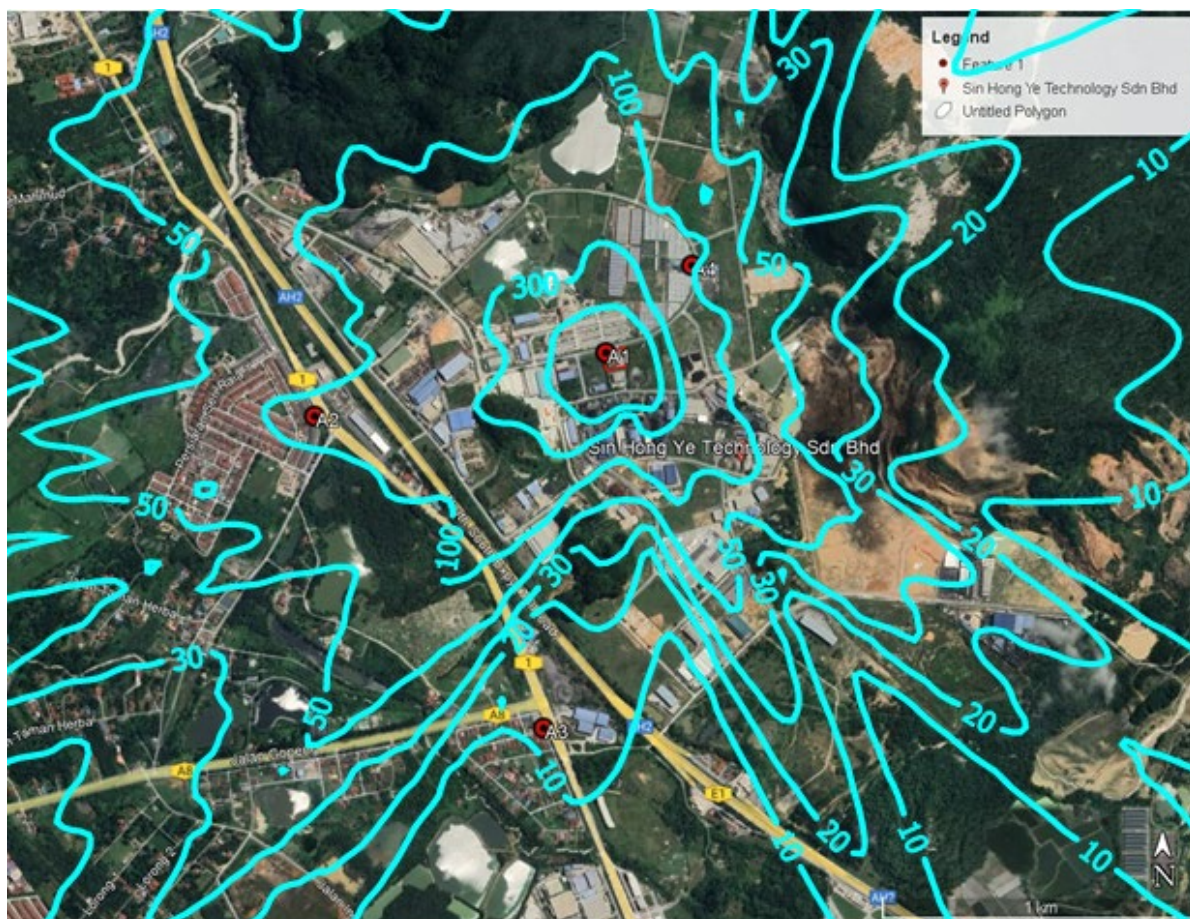


Figure 7.3: Measure 24-hour Average PM₁₀ Incremental Concentration ($\mu\text{g}/\text{m}^3$) Without Control Measures

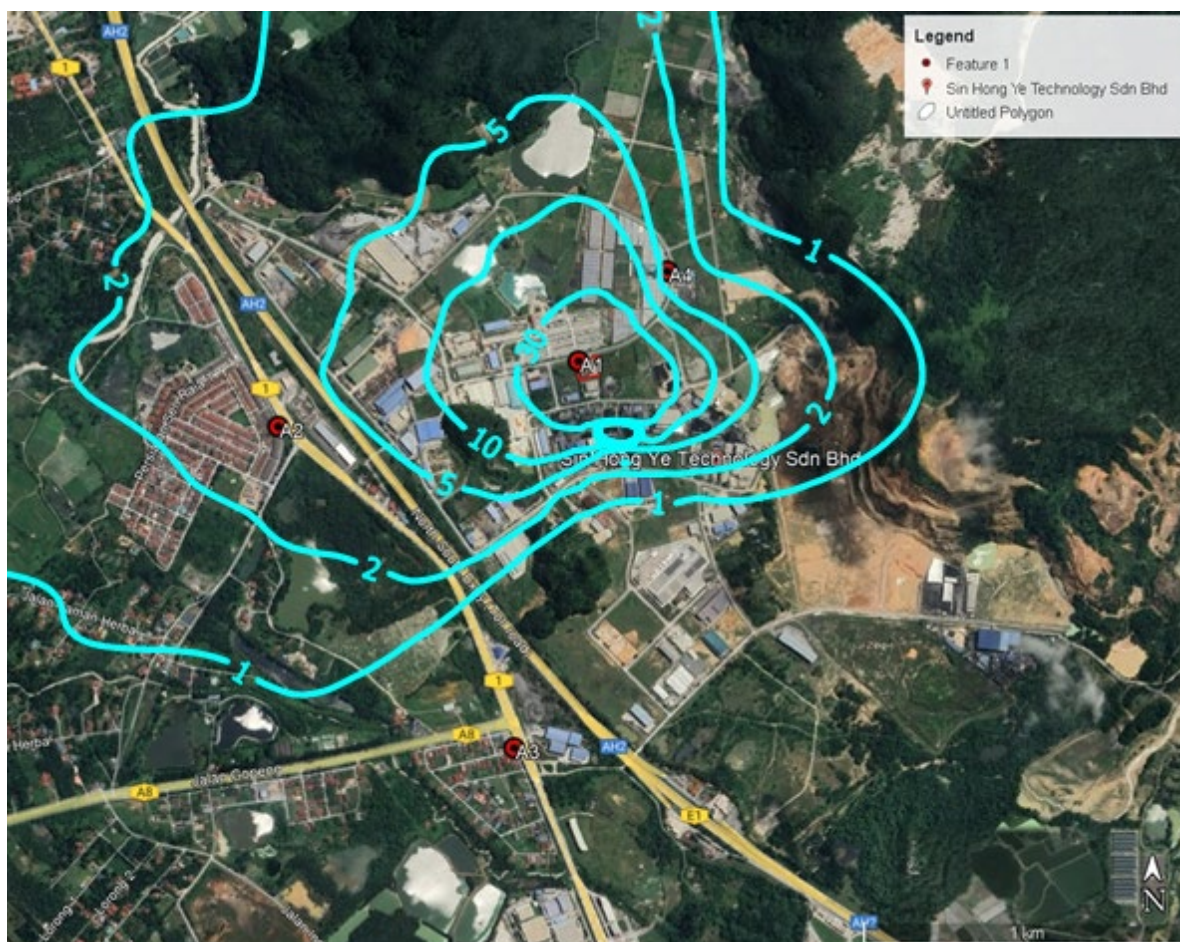


Figure 7.4: Annual Average PM₁₀ Incremental Concentration (ug/m³) Without Control Measures

7.3.16.2 Particulate Matter PM_{2.5}

Particulate matter PM_{2.5} emissions from the air pollution control systems (APCS) of the manufacturing processes are removed with control measures.

Figure 7.5 shows the maximum 24-hour average PM_{2.5} incremental concentration which is between 0.3 ug/m³ at the western and southwestern edge of the receptor grid approximately 3 km away and 2.0 ug/m³ at the project site boundary. With the insignificant incremental concentration and existing base line PM_{2.5} concentrations at the monitoring sites, the resulting predicted ambient air PM_{2.5} concentrations are below the MAAQG limit of 35 ug/m³.

Predicted annual average incremental concentration as shown in **Figure 7.6** is below 0.5 ug/m³ when there are dust control measures in operation. These concentrations are deemed negligible and when added to the existing baseline concentrations at the monitoring sites, the resulting ambient air concentration is below the MAAQG annual average limit of 15 ug/m³. Predicted PM_{2.5} concentrations at the nearest sensitive receptors when there are control measures are well below the MAAQG limit as well.

Tabulated below are the predicted maximum 24-hour average and annual average PM_{2.5} concentration in ug/m³ at the sensitive and discrete receptors when there are dust control measures.

Table 7.12: Predicted Maximum 24-hour Average and Annual Average PM_{2.5} Concentration with the Presence of Dust Control Measures

Receptor	Existing baseline	Incremental		Ambient air	
		24-hour average	Annual average	24-hour average	Annual average
Project Boundary, A1	21	0.3	0.1	21.3	-
Nearest Shophouse at Taman Seri Raia, A2	15	0.4	0.1	15.4	-
Nearest House at Kg. Tekkah, A3	13	0.4	0.0	13.4	-
Entrance at Auasia Nutriculture (Agro-based Industry), A4	17	0.3	0.0	17.3	-
MAAQG for PM2.5				35	15

MAAQG : Malaysian Ambient Air Quality Guidelines

In the case when there are no dust control measures, modelling based on this scenario showed the predicted $PM_{2.5}$ concentrations are higher and the highest maximum 24-hour average incremental concentration is 100 ug/m^3 near the project site decreasing to 5 ug/m^3 approximately 3 km away. When added to the baseline concentrations at the monitoring sites, the resulting ambient air concentrations are above the maximum 24-hour average MAAQG limit of 35 ug/m^3 in areas up to 2 km away from the project site. Contours of the maximum 24-hour average incremental concentration are shown in **Figure 7.7**.

In the event, control measures are not restored over a long period of time, the predicted annual average $PM_{2.5}$ incremental concentration is between 3 ug/m^3 at the western and southwestern edge of the grid and 50 ug/m^3 at the project boundary. When added to the existing baseline concentrations, the annual average $PM_{2.5}$ concentration is above the MAAQG limit of 15 ug/m^3 . Contours of the predicted annual average incremental concentration are shown in **Figure 7.8**. Tabulated below are the predicted maximum 24-hour average and annual average $PM_{2.5}$ concentration in ug/m^3 at the sensitive and discrete receptors when dust control measures fail.

Table 7.13: Predicted Maximum 24-hour Average and Annual Average $PM_{2.5}$ Concentration without the Presence of Dust Control Measures

Receptor	Existing baseline	Incremental		Ambient air	
		24-hour average	Annual average	24-hour average	Annual average
Project Boundary, A1	27	102.9	1.2	129.9	-
Nearest Shophouse at Taman Seri Raia, A2	29	245.3	1.0	274.3	-
Nearest House at Kg. Tekkah, A3	25	122.2	0.1	147.2	-
Entrance at Auasia Nutriculture (Agro-based Industry), A4	22	28.6	0.7	50.6	-
MAAQG for $PM_{2.5}$				35	15

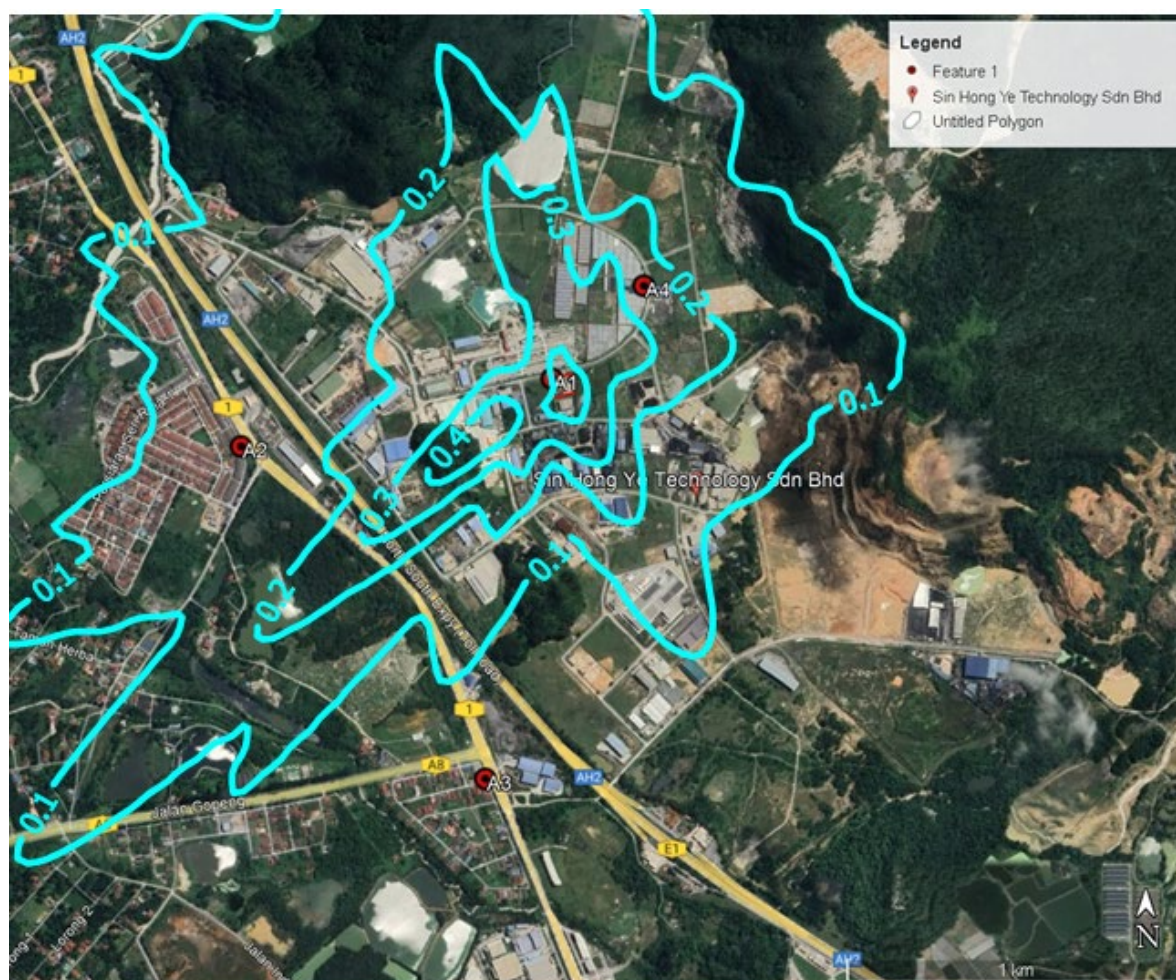


Figure 7.5: Maximum 24-hour Average PM_{2.5} Incremental Concentration (ug/m³) With Control Measures, CAR Limits of 50mg/m³

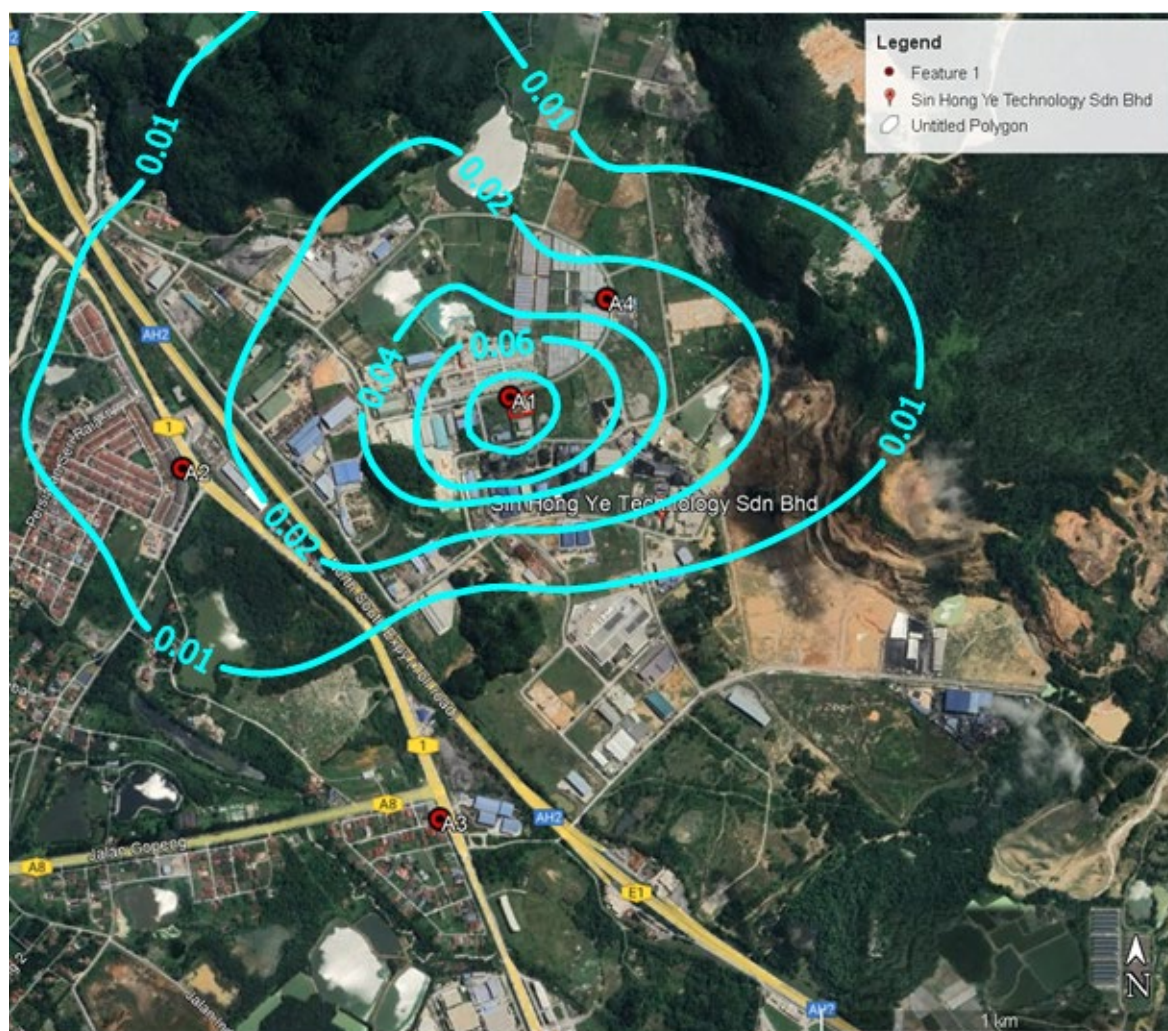


Figure 7.6: Annual Average $PM_{2.5}$ Incremental Concentration ($\mu g/m^3$) With Control Measures, CAR Limits of $50 mg/m^3$

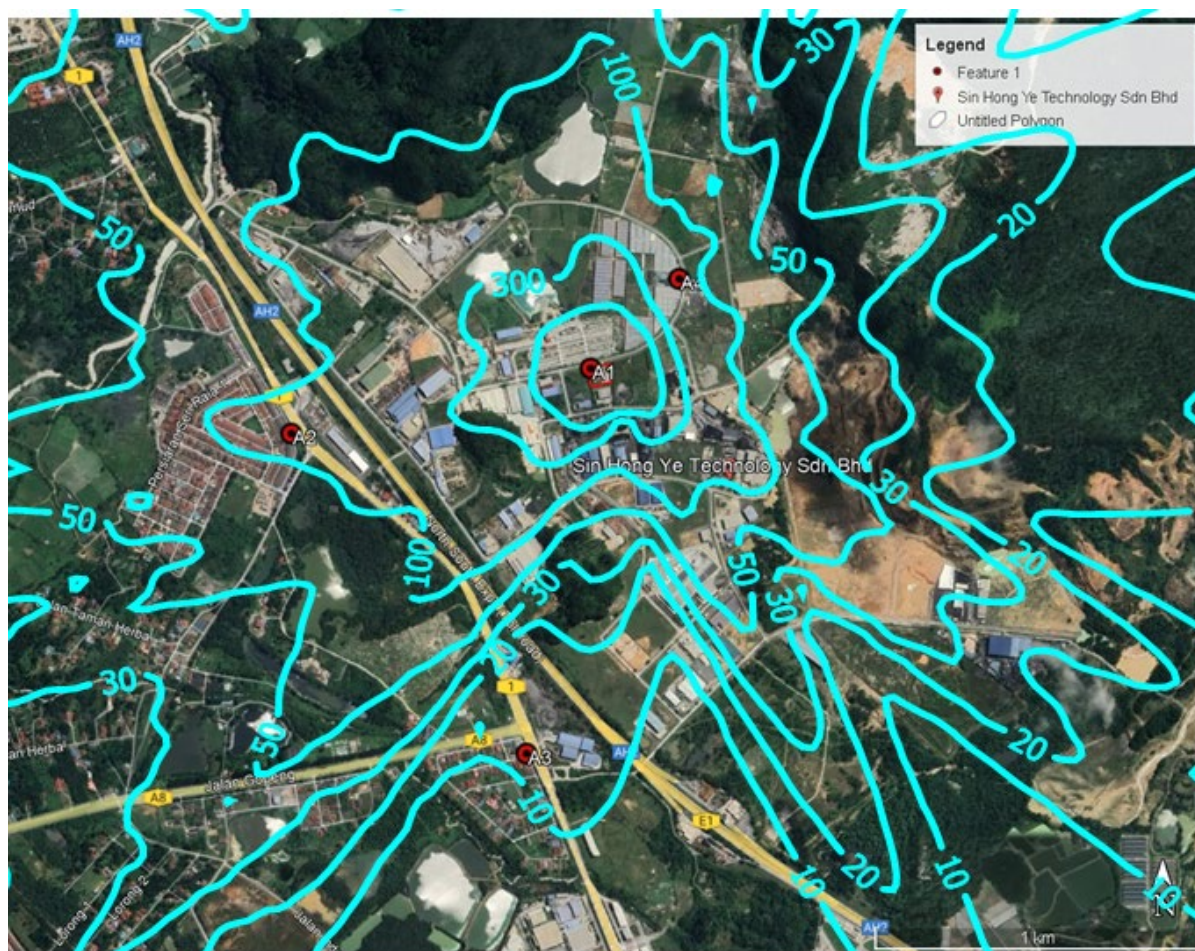


Figure 7.7: Measure 24-hour Average $PM_{2.5}$ Incremental Concentration ($\mu g/m^3$) Without Control Measures

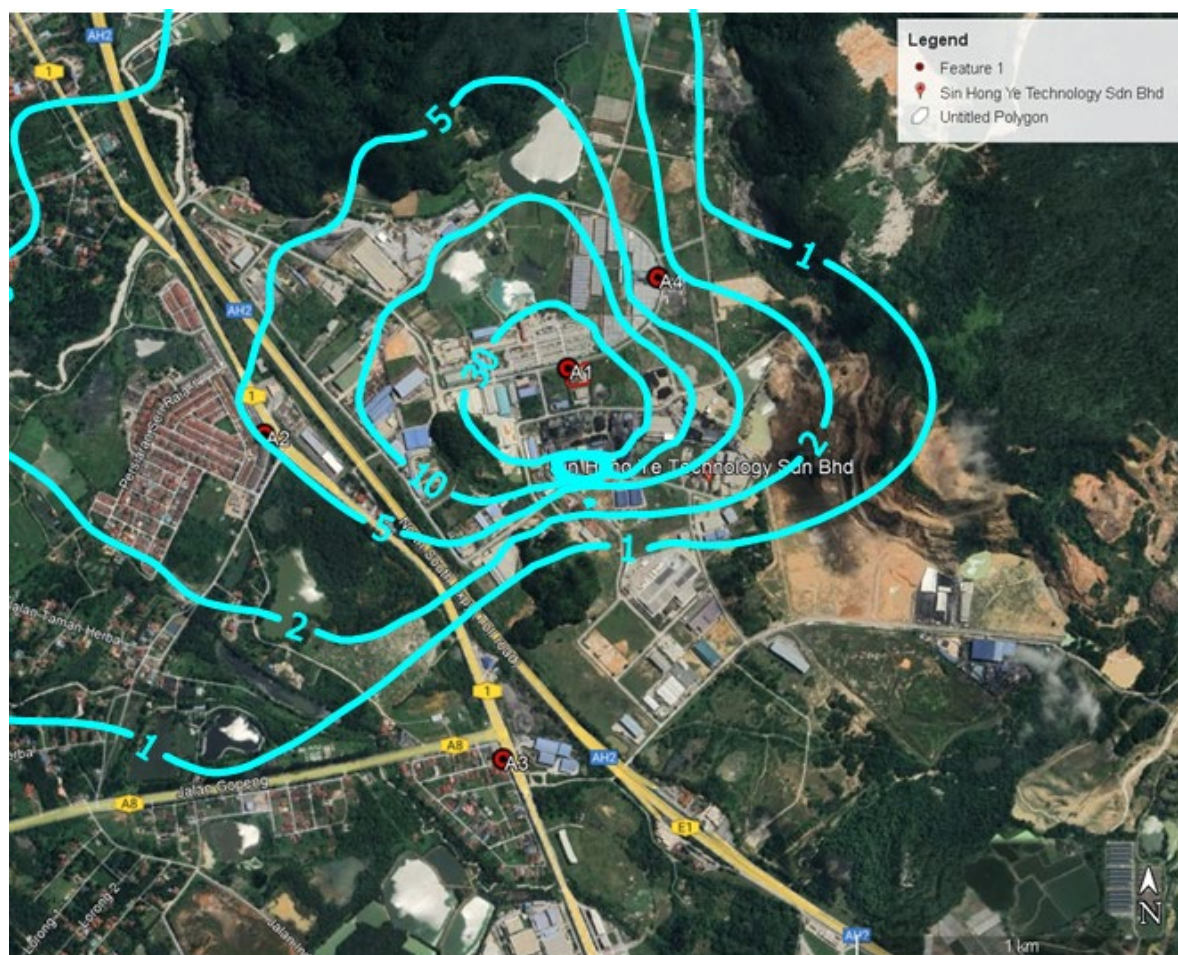


Figure 7.8: Annual Average PM_{2.5} Incremental Concentration (ug/m³) Without Control Measures

7.3.16.3 Sulphur Dioxide

As in most fossil fuels, there are sulphur in the fuel and SO₂ is released when fuel is combusted. To predict the sulphur dioxide (SO₂) concentration in ambient air, the amount of SO₂ emitted is computed based on the Clean Air Regulation limit of 400 mg/m³ for SO₂ when there are control measures.

Figure 7.9 shows the predicted maximum 1-hour average SO₂ incremental concentration resulting from emissions from the manufacturing facility. The affected areas are evenly distributed throughout the receptor grid. The predicted incremental concentration is between 10 ug/m³ at approximately 3 km away to a highest level of 50 ug/m³ near the project site.

These incremental concentrations when added to the existing baseline SO₂ concentrations are below the MAAQG limit of 250 ug/m³ for the maximum 1-hour average concentration.

In the case of the maximum 24-hour average concentration, modelling results showed that the highest concentration is just 10 ug/m³ and decreases to less than 2 ug/m³ approximately 3 km away. These incremental concentrations when added to the existing baseline concentrations are below the MAAQG limit of 80 ug/m³. The spatial distribution of the predicted maximum 24-hour average incremental concentration is shown in **Figure 7.10**.

Tabulated below are the predicted maximum 1-hour average and 24-hour average SO₂ concentration in ug/m³ at the sensitive and discrete receptors for compliant scenario where fuel type selected complied with less than 1% sulphur content.

i). Compliant Scenario

Table 7.14: Predicted Maximum 1-hour and 24-hour Average SO₂ Concentration with Control Measures Scenario

Receptor	Existing baseline	Incremental		Ambient air	
		1-hour average	24-hour average	1-hour average	24-hour average
Project Boundary, A1	29	3.8	1.3	32.8	30.3
Nearest Shophouse at Taman Seri Raia, A2	23	10.2	0.7	33.2	23.7
Nearest House at Kg. Tekkah, A3	25	9.1	0.1	34.1	25.1
Entrance at Auasia Nutriculture (Agro-based Industry), A4	20	1.5	0.3	21.5	20.3
MAAQS 2020 for SO ₂				250	80

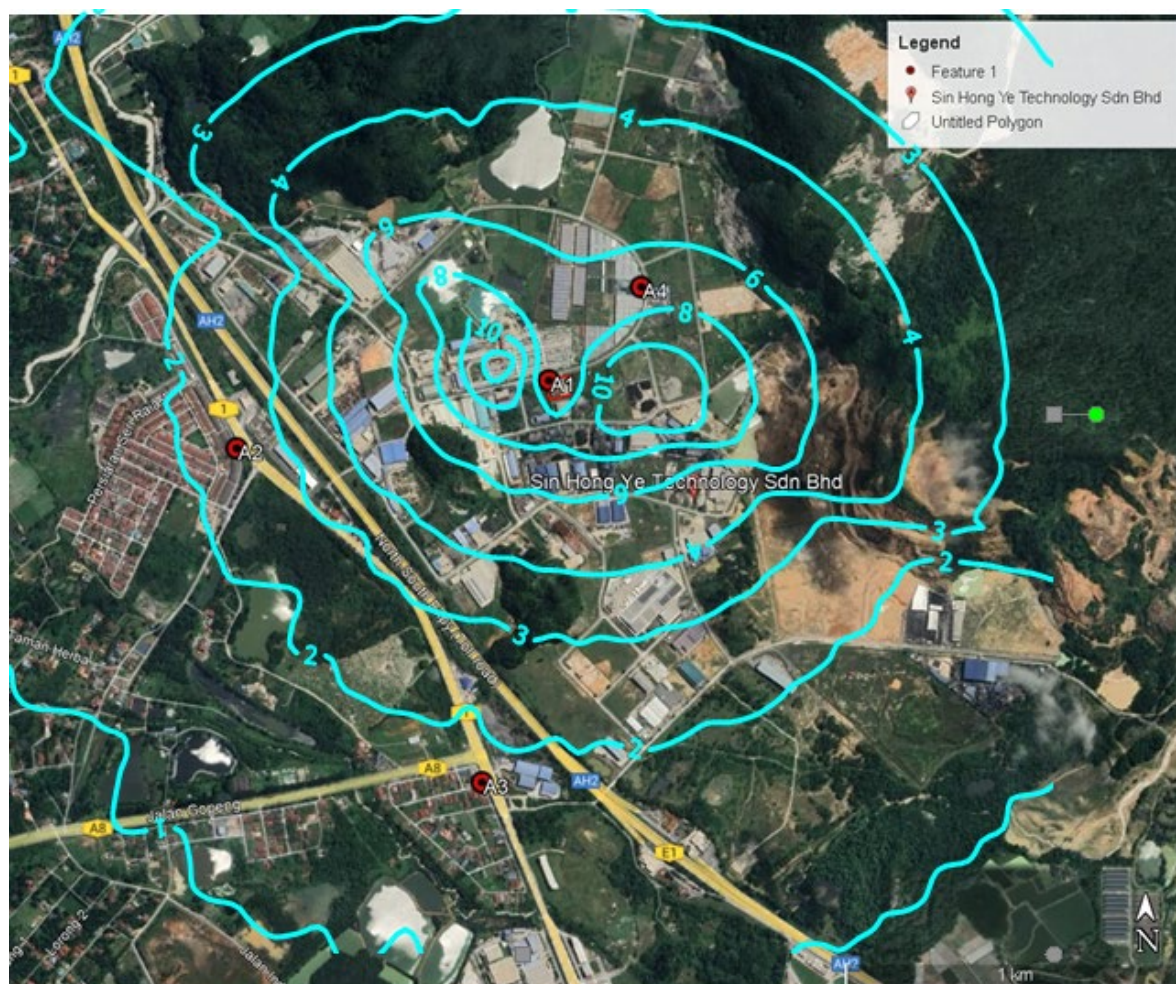


Figure 7.9: Maximum 1-hour Average SO₂ Incremental Concentration ($\mu\text{g}/\text{m}^3$) With Control Measures, CAR Limits of 400 mg/m^3

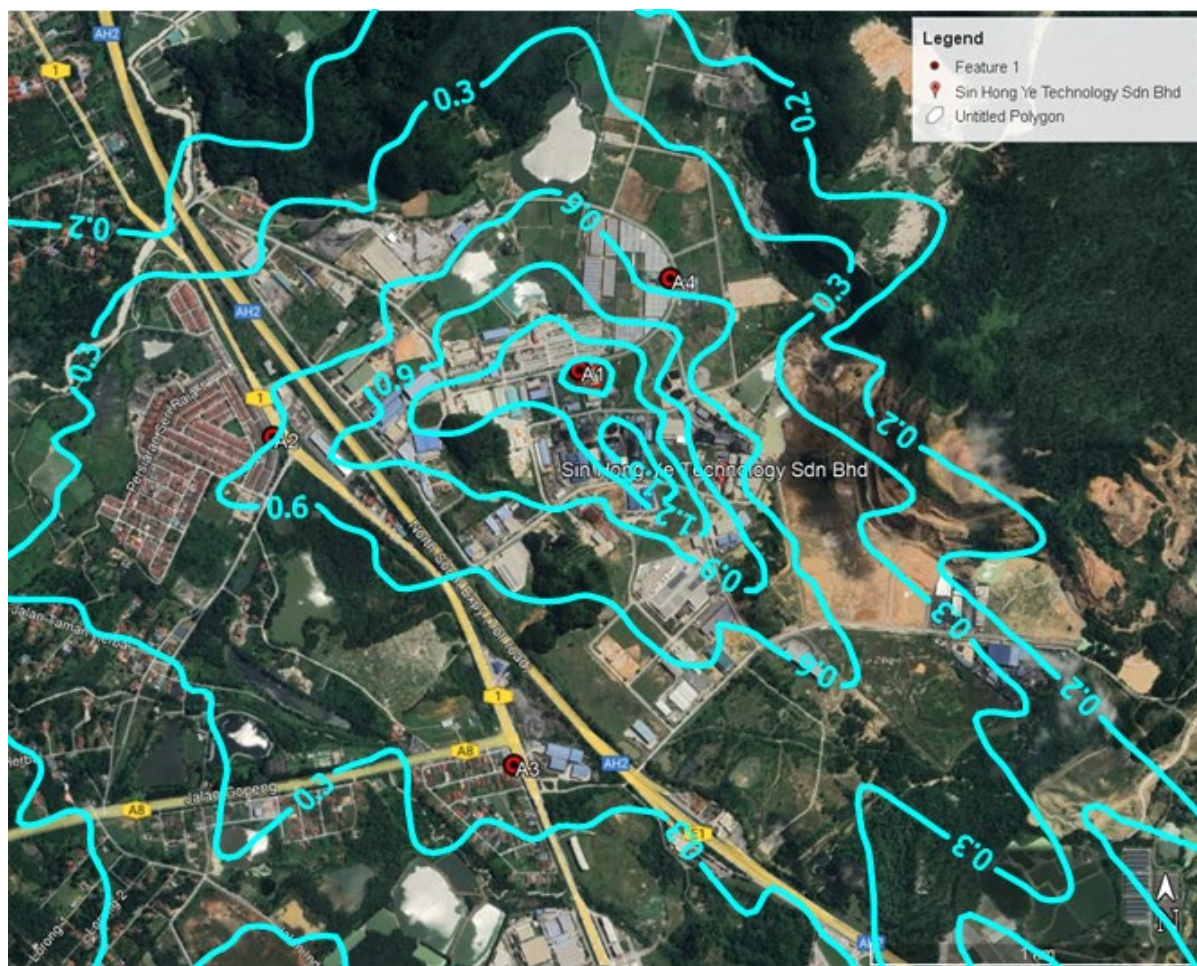


Figure 7.10: Maximum 24-hour Average SO₂ Incremental Concentration (ug/m³) With Control Measures, CAR Limits of 400 mg/m³

7.3.16.4 Nitrogen Dioxide

Nitrogen dioxide (NO₂) emission from the manufacturing facility is expected to be moderate. For NO₂, emission scenarios being studied is emission concentration of NO₂ from APCS are capped at 500 mg/m³, which is a more stringent emission concentration limit of 500 mg/m³. The predicted maximum 1-hour average incremental concentrations as shown in **Figure 7.11** are between 50 ug/m³ at approximately 3 km away and 150 ug/m³ near the project site. With the existing baseline concentrations, the resulting ambient air NO₂ concentration is below the MAAQG limit of 280 ug/m³. For the maximum 24-hour average concentration, it is also below the MAAQG limit of 70 ug/m³ as the predicted incremental concentration as shown in **Figure 7.12** is between 10 ug/m³ and 40 ug/m³ plus the existing baseline concentration of 12 ug/m³ at A2.

Tabulated below are the predicted maximum 1-hour and 24-hour average NO₂ concentration in ug/m³ at the sensitive and discrete receptors for the controlled scenario.

i). With control (stringent)

Table 7.15: Predicted Maximum 1-hour and 24-hour Average NO₂ Concentration with Control Measures Scenario

Receptor	Existing baseline	Incremental		Ambient air	
		1-hour average	24-hour average	1-hour average	24-hour average
Project Boundary, A1	35	14.9	7.7	49.9	32.7
Nearest Shophouse at Taman Seri Raia, A2	27	29.8	7.2	57.8	34.2
Nearest House at Kg. Tekkah, A3	31	21.8	1.3	52.8	32.3
Entrance at Auasia Nutriculture (Agro-based Industry), A4	24	6.6	1.1	30.6	25.1
MAAQS 2020 for NO ₂				280	70



Figure 7.11: Maximum 1-hour Average NO₂ Incremental Concentration (ug/m³) With Control Measures, CAR Limits of 500 mg/m³



Figure 7.12: Maximum 24-hour Average NO₂ Incremental Concentration (ug/m³) With Control Measures, CAR Limits of 500 mg/m³

7.3.17 Conclusion

When all gaseous emissions from activities of the fuel oil manufacturing facility are removed as per designed, the predicted particulate matter PM_{10} , $PM_{2.5}$, sulphur dioxide (SO_2) and nitrogen dioxide (NO_2) concentrations using the USEPA AERMOD Model and data supplied by the project proponent are below the MAAQG limits for these gases.

However, in cases when dust and gaseous control measures fail and based on removal efficiencies of the air pollution control systems, predicted PM_{10} , SO_2 and NO_2 concentrations in ambient air are above the MAAQG limits of these air pollutants in areas up to 2 km away for PM_{10} , 1.5 km away for SO_2 and 2.5km away for NO_2 .

7.4 NOISE QUALITY

Noise is generated during the machinery setting up and operational phases. The magnitude, duration and frequency of noise will vary according to the type of activities that will be carried out, equipment used and background noise levels.

7.4.1 Operational Phase

The major noise sources from the operation of the project are mainly contributed by long term steady continuous noise emission principally from the air pollution control system (APCS) proposed for the project. Among the major noise sources (6 locations) identified with sound pressure levels above 80 dBA from the plant are as below:-

- Wire stripper machine (1 location)
- Crusher (1 location)
- Pyrolysis reactor (1 location)
- Main condenser (1 location)
- Flaring mechanism in the flaring chamber (1 location)
- Exhaust fan pump for wet scrubber (1 location)

The operation of the crusher will be on intermittent basis when the rubber tire wastes is more than designed feeding size. Pyrolysis and condensation activities will be conducted during day time only.

7.4.2 Review of Operational Noise Permissible Level

The permissible noise levels for the operation of the project are referred to Schedule 2 of *Guidelines for Environmental Noise Limits and Control, 2019*. Schedule 1 prescribes the maximum permissible sound level (LA_{eq}) by receiving land use for planning purposes and new development. These are deemed desirable limits to be used for new development in the undeveloped areas. In reference to Schedule 1 limits, the permissible noise level at the boundary of the project site is of 70 dBA during day and 65 dBA during night.

While for the receptor since, Schedule 2 which recommended permissible sound level (LA_{eq}) at receptor location in the context of existing developed area will be referred. The permissible reference level at the suburban residential area is proposed at 60 dBA during day and 55 dBA during night.

Review of existing baseline ambient noise level against the respective Schedule 1 and Schedule 2 of *Guidelines for Environmental Noise Limits and Control 2019* recommended that a reference limits of 75 dBA to be maintained within the project boundary. While the reference limits at the receptor site is 60 dBA for day and 55 dBA for night as proposed in Schedule 2 for suburban residential area. Refer the table below.

Table 7.16: Baseline Noise Quality and Permissible Levels (dBA)

Monitoring Point	Baseline Level, LA_{eq}		Permissible Level, dBA
	Day	Night	
Project Boundary (N1)	62.4	59.0	Schedule 2 ~ Commercial Business Zone LA_{eq} day = 70 dBA LA_{eq} night = 65 dBA
Nearest Shophouse at Taman Seri Raia (N2)	58.1	53.0	Schedule 2 ~ Suburban Residential LA_{eq} day = 60 dBA LA_{eq} night = 55 dBA
Nearest House at Kg. Tekkah (N3)	51.2	48.3	Schedule 2 ~ Suburban Residential LA_{eq} day = 60 dBA LA_{eq} night = 55 dBA
Entrance at Auasia Nutriculture (Agro-based Industry) (N4)	54.6	50.0	Schedule 2 ~ Commercial Business Zone LA_{eq} day = 70 dBA LA_{eq} night = 65 dBA

7.4.3 Methodology of Assessment

In the assessment of noise, a common statistical descriptor is LAeq. LAeq is the constant, average noise level, which over a period of time, contains the same amount of energy as the varying levels of the background or machinery noise.

Assessment of noise is conducted in reference to standard inverse square law which rules that every doubling of the distance from the sound source in a free field condition, the sound intensity will diminish by 6.0 dB. The intensity of the sound is inversely proportional to the square of the distance of the wavefront from the signal source. Based on this law, given the sound power level of the equipment source, at a distance of 'r' meters, the sound pressure level could be calculated based on the following basic sound propagation equation:

Equation 1

$$\text{SPL} = \text{SWL}_{\text{point}} - 20 \log(r) - 11 \text{ dB} + \text{DI}$$

Where,

SPL = Sound Pressure Level, dB

SWL = Sound Power Level of the source, dB

r = Distance between source and receiver in meter

DI = Directivity Index (DI) = $10 \log_{10} Q$

Q = Directivity Factor (refer DI vs Q table below)

Table 7.17: Directivity Factor (Q) and Directivity Index (DI) for Noise

Source Location	Directivity Factor, Q	Directivity Index, DI
No surface near sound source; able to radiate acoustic energy in all directions; full sphere	1	0
Sound source close to a flat surface; able to radiate acoustical energy to half of a sphere (hemispherical)	2	3
Close to two adjacent flat surfaces perpendicular to each other, able to radiate to one fourth of a sphere	4	6
At a corner; able to radiate acoustical energy to	8	9

Source Location	Directivity Factor, Q	Directivity Index, DI
one eight of a sphere		

Equation 2

To combine multiple sources (equipment mix) into a total equivalent sound level, the following algorithms is adopted:

$$L_{\text{total}} = 10 \times \log_{10} \sum [10^{(L_N / 10)}] \text{ (dB)}$$

Where,

L_{total} = the total equivalent noise level for combination of several noise sources;

N = the number of different types of equipment; and

L_N = the equivalent noise level for equipment type.

Equation 3

For outdoor sound propagation, given the equivalent sound pressure level from at a point, noise at specific distances from the point is calculated using the formula for distance attenuation taken into consideration of additional loss as below:

$$L_{p2} = L_{p1} - 20 \log r_2 / r_1 - A_e$$

Where,

L_{p1} = the measured sound pressure level at r_1 from the source (dB).

L_{p2} = the calculated sound pressure level at r_2 , m distance from the source.

r_1, r_2 = distance from source to measurement L_{p1} and L_{p2} , respectively

A_e = attenuation for the distance $r_1 - r_2$, dB

A_e is additional losses due to additional attenuation factor including atmospheric absorption, ground effects and other miscellaneous loss as well as barrier shielding effects.

Noise assessment for this study is conducted using noise model MASdBMap Version 0.5. The

basis of the model is linear sound propagation equation to simulate point emission sources from industries or stationary sources to a specific distance. The model uses numerical algorithms of inverse square law to estimate dispersion of noise.

Given the sound power of a point source or the total equivalent sound level from multiple sources, noise at specific distance from the sources are calculated using mathematical algorithms as presented in Equation 1, Equation 2 and Equation 3 above. The model adopts ISO 9613-2 standards for attenuation and absorption effects. The model calculates the noise level in each point of space considering each source. The simulated noise could be presented in grid format and noise contour.

Based on the noise contour simulated for the Project, cumulative ambient noise level taken into consideration of background/ baseline noise and the Project incremental noise will be computed using the same algorithms as presented in Equation 2 above.

7.4.4 Operational Noise Sources

A review on the equipment list for the proposed project indicated that noise is mainly contributed by the power driving and rotating parts fitted to the air pollution control systems, pyrolysis reactor, main condenser, crusher and wire stripper of the proposed for the project. The most significant noise sources from the production process are from crushing and shredding activities.

Noise emission sources and the corresponding sound pressure level from the proposed scheduled wastes recovery plant is listed in **Table 7.18** below.

Table 7.18: Sound Data of the Main Noise Significant Part from the Proposed Recovery Plant

No	Project Component	Noise Sources	Source Marking in Model		
			SPL	SWL	Noise Point
1	Wire Stripper	Stripping of Steel Wires	85	96	NP1
2	Crushing Machine	Crushing of Metals	88	99	NP2
3	Pyrolysis Reactor	Pyrolysis of Raw Materials	88	99	NP3
4	Main Condenser	Condensation of Pyrolysis Vapour	85	96	NP4
5	Flaring Chamber	Flaring Mechanism	85	96	NP5
6	Wet Scrubber	Exhaust Fan	85	96	NP6

Source: Sound pressure level provided by the project proponent

7.4.5 Noise Modelling

(i) Model Input Data and Assumption

For the assessment of operation noise from the project, noise sources with sound power level (SWL) as presented in **Table 7.18** are adopted for modeling input. Noise contour simulation was conducted for project boundary and to the regional level at the receptor sites. The following assumptions were made in this modelling exercise:

- All the sources are predicted to be in full operation simultaneously thus the simulation will be based on the worst-case scenario.
- Sound attenuation taken into meteorological consideration of average 28°C with 80% humidity and hard ground surface.
- The model considers noise dispersion in free path without consideration of diffraction and reflection interference between the source and receptor.
- With control measures, a noise reduction of 15 dB will be achieved for the centrifugal fan pump upon acoustic treatment with steel jacket and rubber insulation.
- The height of the receptor is defined at 1.5 m from the ground level.

(ii) Modelling Scenario

Two models were performed, one to assess the operational noise propagation to the Project boundary while the other to assess the operational noise propagation to the nearest receptor. Both of the models were simulated for scenario for without control measure (worst case scenario).

(iii) Modelling Result

Operational noise for the project was simulated for worst case scenario considering all the noise emission sources are in operation simultaneously during day and night. Boundary noise is predicted in range of 57.0 dBA to 66.0 dBA as presented in **Figure 7.13**.

On the regional setting, project noise propagated to the nearest identified receptor at N1, N2, and N3 are predicted at 60.0 dBA, 51.0 dBA and 45.0 dBA for worst case scenario. Project noise propagation to regional scale for worst case scenario is presented in **Figure 7.14**.

The predicted project noise levels at the receptor sites N1, N2 and N3 with cumulative noise level and incremental for the worst-case scenario are presented in **Table 7.19** below.

Table 7.19: Predicted Project Noise Dispersed to the Identified Receptor (dBA)

Location	Baseline Level	Description	Worst Case			Ref
			Predicted	Cumm'	Incre'	Limit*
Day Time Scenario						
N1	62.4	Project Boundary	57	63.5	1.1	70
N2	58.1	Nearest Shophouse at Taman Seri Raia	32	58.1	0.0	60
N3	51.2	Nearest House at Kg. Tekkah	30	51.2	0.0	60
N4	54.6	Entrance at Auasia Nutriculture (Agro-based Industry)	41	54.8	0.2	70
Night Time Scenario						
N1	59.0	Project Boundary	57	61.1	2.1	65
N2	53.0	Nearest Shophouse at Taman Seri Raia	32	53.0	0.0	55
N3	48.3	Nearest House at Kg. Tekkah	30	48.3	0.0	55
N4	50.0	Entrance at Auasia Nutriculture (Agro-based Industry)	41	50.5	0.5	65

7.4.6 Evaluation of Impact

The finding of the assessments indicated that with the operation of the project, cumulative noise at the project boundary is less than 70 dBA for day time and 65 dBA for night time, while N2 and N3 which is in the suburban area has cumulative noise less than 60 dBA and 55 dBA for both day and night, showing that they are well within the proposed day and night noise reference limits for worst case scenario.

For the worst-case scenario, the project is expected to cause an incremental noise of less than 4.0 dBA during day. During night time, at the nearest sensitive receptor (N1), there'll be an increment of 2.1 dBA. The predicted incremental are considerably low and is anticipated with minimum noise impact at the project boundary.

At N3 receptor site, day time and night time incremental is predicted to have 0.0 dBA increment for worst case scenario. The increase of 0.0 dBA is normally un-noticeable and thus predicted with insignificant impact.

The project is predicted to have 0.0 dBA incremental during day time and night time at receptor site N2 for worst case scenario.

Overall, the operation of the proposed project is anticipated with minor increase of localized noise at the boundary of project site and negligible impact is predicted at the nearest receptors.

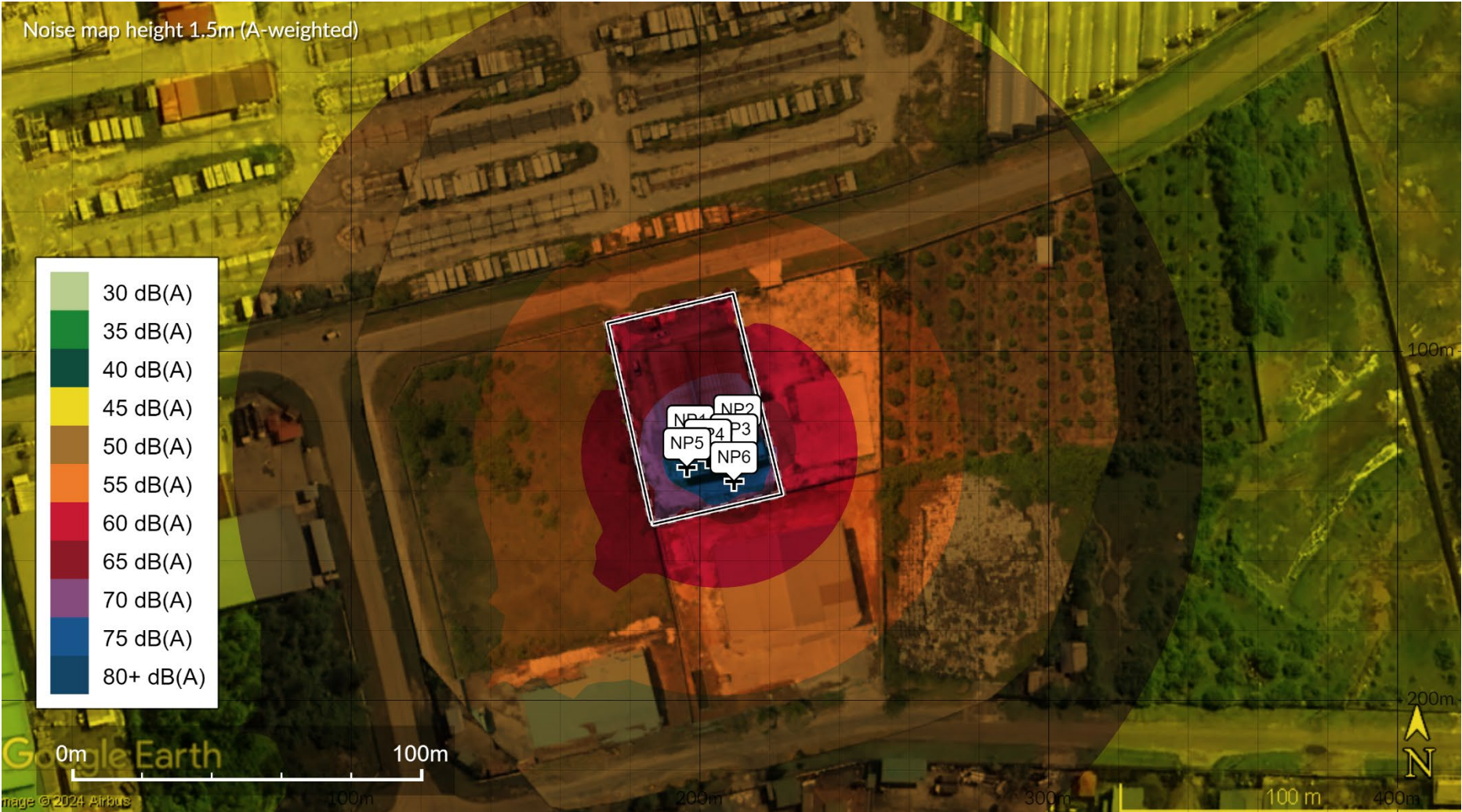


Figure 7.13: Project Boundary Noise for Worst Case Scenario

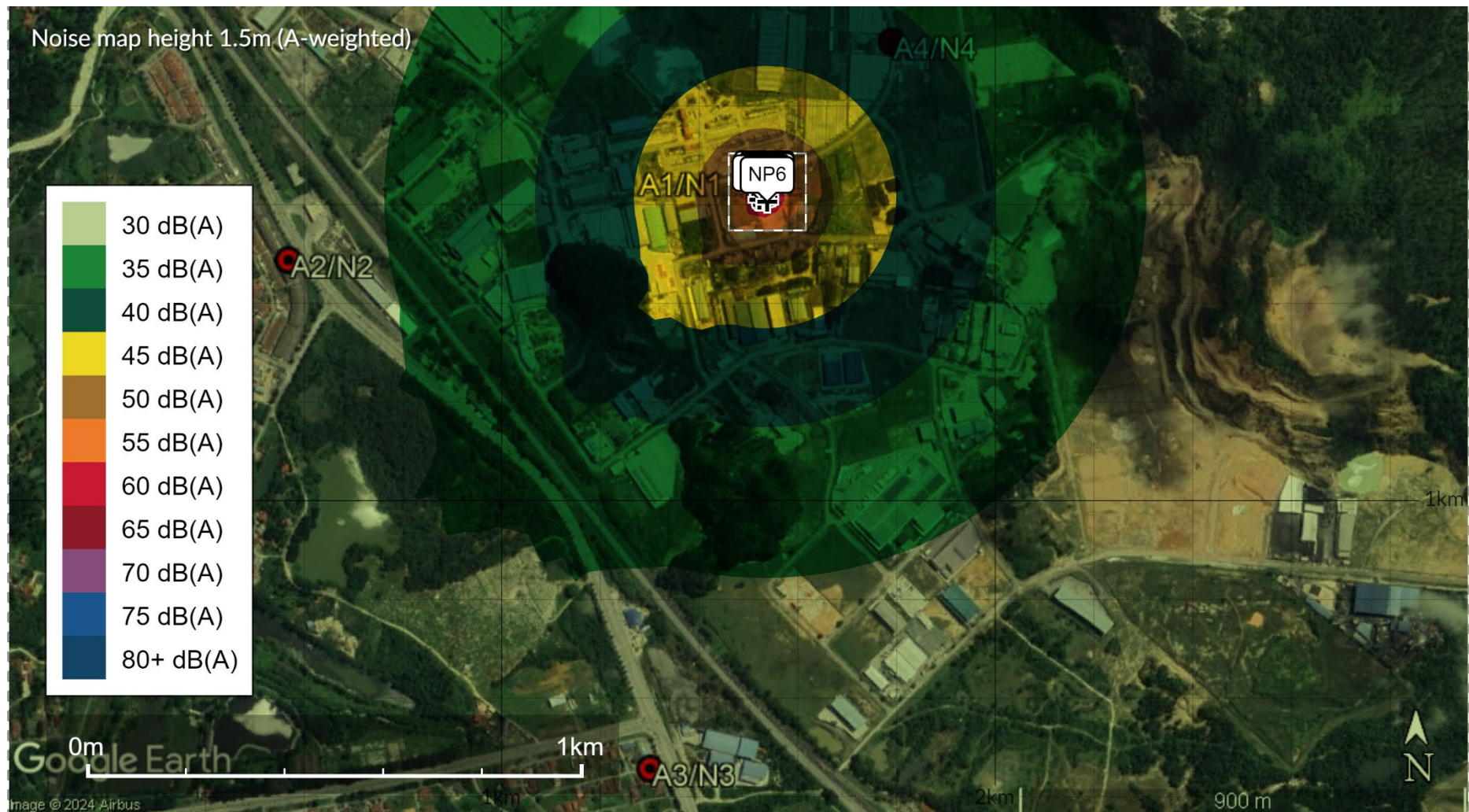


Figure 7.14: Project Noise to Regional Receptors for Worst Case Scenario

7.5 WASTE MANAGEMENT

7.5.1 Waste Management During Operational Phase

Generally, the source of potential solid waste generation from operation of the Project will be domestic waste generation from the admin building and workers on-site. The domestic waste will be collected by the local authority and disposal at the designated dumpsite.

Other types of waste potentially from the operation of facility will be the residual waste results from the manufacturing processes in the form of rejects, as well as the scheduled waste from machinery maintenance activities of the plant facilities.

The Project is expected to generate some amount of residual waste during operational stage. These residues, when not adequately stored and barely in contact with rain water will cause severe environmental pollution. Thus, having a proper residue storage area to prevent any spillage is of paramount importance. These wastes will be stored on-site at the designated area prior to being sent to Kualiti Alam Sdn Bhd (KA) or any other licensed prescribed recovery premise for disposal.

The facility machinery and equipment also will be subjected to on-site maintenance. The waste oil and grease will be collected, stored in proper containers, sealed, and labelled before disposal off by DOE licensed contractors.

By implementation of a proper solid waste management plan, the impact from solid waste will be greatly reduced. The collection of solid wastes shall be done by local authority – Majlis Daerah Batu Gajah (MDBG) licensed solid waste collector.

7.6 TRAFFIC IMPACT

Based on 300 tonnes processing capacity per month, the number of trips generated per day is expected to be 3 – 4 trips by using 5 MT and 3 MT trucks, or 1 trip by using trailer trucks. They will use Government approved tarred roads for heavy vehicles. The route used will be planned to avoid dense residential areas. The transportation routes are mainly focused within Kawasan Perindustrian Tungzen.

Emergency Response Plan or ERP for transportation of rubber tire wastes and related feedstocks to and from Waste Generators' premise to Project site shall cover the following: road accident-vehicle breakdown-spillage of scheduled waste in transit. All drivers shall be regularly trained in ERP procedures and ERP drills at least once a year. The vehicles are equipped with emergency response equipment all the time such as:

- Portable spill kit which includes personal protection equipment, absorbent, disposal bags, etc.
- Fire extinguishers
- First aid kit
- Safety signage
- Seventh Schedule as required under EQ (SW) Regulation, 2005

7.7 RISK ASSESSMENT

7.7.1 Hazards During Operation

The proposed recovery processes are inherently stable and safe and should not pose any serious threat to the environment and to the health and safety of workers and the surrounding public.

Included in the processes are ways and means to deal with possible process danger points and waste materials produced such as residues and solid particles. Despite efforts to minimize and remove every possible source of negative impacts by introducing and including in the Project mitigation measures, there is always an element of risk due to hazard episodes caused by human carelessness and accidents. The hazards envisaged from this Project are in:

- (a) Handling;
- (b) Transport;
- (c) Fire; and
- (d) Health and Safety

7.7.1.1 Handling Hazard

Handling of raw materials and finished goods within the Plant includes all activities involved with loading, unloading and transferring of materials to processing areas and storage areas within the Plant. Rubber tire wastes are generally stored outdoors in stacks. Refined oil is stored in storage tanks or drums whereas decanter sludge and POME sludge are stored in drums or jumbo bags. On the other hand, steel wires and carbon black are stored in jumbo bags.

Their movements will be facilitated by forklift. Due to careless handling of forklifts, accidents may happen to cause drums or jumbo bags to be dropped and spillage of waste to occur. The potential adverse impact is spillage due to handling accidents. A spillage episode, if not quickly and effectively attended to, may cause health and safety hazards to workers in the Plant. An accident may incur injury and even fatality to workers.

The raw materials received by the pyrolysis Plant comprise only of solid and semi-solid forms whereas the products are in solid and liquid forms. The materials will be harmful only when accidentally dropped or run into. However, this event is unlikely to happen.

All equipment used in the processes such as the crusher and wire stripper are low risk machines, except the pyrolysis reactor, which is considered a moderate risk machine. In addition, all of the controllers, electrical motors, pumps and switches in them are industrial usage quality and hence safe.

7.7.1.2 Transport Hazard

Raw materials will be collected and transported to the Plant for processing by experienced logistic transporters. Finished products will be similarly delivered to customers. Scheduled wastes and solid wastes generated will be transported to KA and municipal landfill site for disposal, respectively by licensed contractor (DOE or MDBG).

Heavy vehicle transportation, therefore, forms an integral component of the Project's activities. During this activity, there is a possibility of spillage of raw materials and finished goods at the collection and destination points due to careless handling. In between, on the road, the possibility of accidents caused by dangerous driving may discharge refined oil and sludge onto the road. This is eliminated by using containers trucks or lorries mounted with properly secured skip.

7.7.1.3 Fire Hazard

Smoking in the Plant should be prohibited and strictly enforced. These areas should be adequately ventilated. Apart from fire and explosion hazard, any vapor leaked to the workplace atmosphere may cause health hazard.

7.7.2 Qualitative Risk Assessment

7.7.2.1 Introduction

Risk Assessment is an aid to decision-making. It screens the proposed Project for areas of potential liabilities and alerts the PP of any significant risk areas to reconsider and, if necessary, to mitigate for Project viability.

A comprehensive risk assessment study will therefore take into consideration the need and benefits of the proposed Project, the location and environmental sensitivity of the Project site and the activities and components of the Project. This study will initiate an identification of potential hazards. Likelihood of occurrence of identified hazards will be assessed and their consequences determined. These factors will be analyzed to determine the associated risks of the hazards. All risks will be compared to established tolerance limits. Risk Management and Communication will be discussed, and proposals forwarded to mitigate significant risks and liabilities due to the Project.

7.7.2.2 Hazard Identification

The term "hazard" is perceived to have potential adverse consequences on humans (death or injury), property (damage) and on the environment. Associated with the term "hazard" is the likelihood or probability of occurrence of the "hazardous" event. Consequence is a measure of the effect associated with a hazardous event happening.

In this Project, hazards are identified from the following activities:-

- Transport of waste materials and finished products to and from the Plant;
- Storage and handling of raw materials and finished products within the Plant;
- Crushing, wire stripping and blending processes;
- Pyrolysis of raw materials
- Gaseous emissions; and
- Residue storage

Identification Method

Hazards will be identified from the activities of the Project that have potential to cause adverse health and environmental impact. The “What If” analysis approach will be used to screen all activities to identify likely hazardous events and their consequences.

Inherently hazardous substances dealt with in the Project, such as spent oil may have potential to impact negatively on the environment and the health and safety of workers and the general public. The risks associated with the use of these substances will be evaluated in conjunction with the activities involved and the mitigation measures taken.

List of Credible Incidents

A list of credible hazardous incidents for each component activity of the Project is given in **Table 7.20**.

Hazards due to Equipment Failure

Table 7.21 gives a list of equipment to be used in the Plant, the likely hazards from equipment failure, their probability of occurrence and their consequences when the hazards occur.

The impact of equipment failure is found not to be serious in occurrence and consequence generally to cause damage to property and injury to workers.

Table 7.20: Hazard Incidence for Each Activity

No.	Item	Event	Hazard Incidence	Comments
1	Collection and transportation of raw materials and finished goods	Damaged containers	Leakage and spills	Very unlikely event. Containers will be checked prior to use and will be properly sealed for transport.
		Accident involving vehicle collision	Road spills without accompanying fire	Unlikely event but conceivable. Major road accident, with accompanying spillage, is unlikely.
2	Material handling in the Plant	Accident involving movement of materials in the Plant	Spills	Very unlikely event as movement of materials within the Plant will be strictly controlled by a planned logistic. In addition, a formal clean-up operational procedure will be in place to cope with this eventuality.
3	Stripping of steel wires	Accident involving operation of machine	Physical injuries to workers	Unlikely event. Workers shall abide to the safe operation procedures of the machine. Maintenance will be carried out regularly.
		Failure of machine	Leakage and spillage of dusts	Unlikely event. Maintenance will be carried out regularly.
3	Crushing of rubber tire wastes	Failure of crusher system	Leakage and spillage of dusts	Unlikely event. Maintenance will be carried out regularly.
4	Blending of sludge	Failure of blending equipment	Leakage and spillage of sludge	Unlikely event. Maintenance will be carried out regularly.
5	Pyrolysis reactor	Failure of reactor	Leakage and spillage of raw materials, carbon black and flue gas	Unlikely event. Maintenance will be carried out regularly.

6	Main condenser	Failure of machine	Leakage and spillage of refined oil, pyrolysis vapour and flue gas	Unlikely event. Maintenance will be carried out regularly.
4	Flaring chamber (APCS 1)	Failure of equipment	Leakage	Unlikely but conceivable. Maintenance will be carried out regularly.
			Air not properly filtered and ejected	Unlikely but conceivable. Maintenance will be carried out regularly.
5	Wet scrubber (APCS 2)	Failure of equipment	Leakage	Unlikely but conceivable. Maintenance will be carried out regularly.
			Air not properly filtered and ejected	Unlikely but conceivable. Maintenance will be carried out regularly.
7	Disposal of residue	Disposal of solid wastes	Water or soil pollution	Unlikely. Residue will be stored temporary in residue collection skip at the residue storage area before sending to local authority landfill for disposal.

Table 7.21: Hazard Associated with Equipment Failure

Process	Type	Hazard	Incident	Effect
Air pollution control system (APCS)	Flaring Chamber	Failure	Very unlikely	Process stops
	Wet Scrubber	Failure	Very unlikely	Process stops
Wire stripping of steel wires	Wire Stripper	Failure	Very unlikely	Process stops
Crushing of rubber tire wastes	Crusher	Failure	Very unlikely	Process stops
	Conveyor	Failure	Very unlikely	Process stops
Blending of decanter sludge and POME sludge	Blending Equipment	Failure	Very unlikely	Process stops
Pyrolysis of raw materials	Pyrolysis Reactor	Failure	Very unlikely	Process stops
Condensation of pyrolysis vapour	Main Condenser	Failure	Very unlikely	Process stops
Disposal of residue	Residue storage	Spillage	Very unlikely	Revisit SOP

7.7.2.3 Risk Assessment

(a) Methodology

Based on hazards identified, qualitative risk analyses using both the Risk Matrix Method and the Risk Reference Method described in Annex C of the Risk Assessment Guidelines of DOE will be performed.

In the Risk Matrix Method, risk is scored as Very Likely, Likely, Unlikely or Very Unlikely and the consequence is scored as Catastrophic, Major, Minor or Insignificant. The definition of the scores for risk likelihood and consequence follows that of Tables C-3 and C-2 and Figure C-3 in the Risk Assessment Guidelines of DOE.

The Risk Matrix Method uses only two parameters i.e. the likelihood of occurrence of the hazard and the overall consequence due to the occurrence of the hazard to evaluate the risk based on the scoring system given in Fig. C-3. The Risk Reference Method includes more parameters. The risk pertaining to the hazard is determined as the product of frequency (F) of exposure and the likelihood (L) of incidence. The consequence of the hazard is expanded to include intensity (I) of injuries to human and extensity of persons (EP) and area (EA) involved. The Risk Score is then obtained as follows: -

$$\text{Risk Score} = F \times L \times I \times EP \times EA$$

The five parameters are as defined in Tables C-4 for F, C-5 for L, C-6 for I, C-7 for EP and C-8 for EA in the Risk Assessment Guidelines by DOE.

Results

The results of the Risk Matrix Analysis are shown in **Table 7.22**. All the potential hazards have scores below the threshold score of 8. Any score above this threshold may require a quantitative risk assessment to be carried for the hazard.

The outcome of the Risk Reference Analysis is shown in **Table 7.23**. All the Risk Scores are found to be very much below the threshold value of 4,096 suggested by DOE to do a quantitative risk assessment on that hazard. The results of these two analyses indicate that the risk of the hazards due to this Project is not severe and significant. With safety, health and disciplinary measures included into and enforced during the operation, the risks of potential hazards can further be reduced.

Table 7.22: Result of Risk Matrix Analysis

Item	Activity	Hazard	Likelihood (L)	Consequence (C)	Score (L x C)
1	Collection and transportation of wastes	Spill of materials	2	1	2
2	Storage and handling in the plant	Spill of materials	2	1	2
3	Wire stripping of steel wires	Physical injuries to workers	1	2	2
		Leakage	1	2	2
4	Crushing of rubber tire wastes	Spill of materials	2	1	2
		Failure of crusher	1	2	2
5	Blending of sludge	Leakage	1	2	2
6	Flaring chamber (APCS 1)	Leakage	1	2	2
		Air pollution	2	2	4
7	Wet scrubber (APCS 2)	Leakage	1	2	2
		Air pollution	2	2	4
8	Pyrolysis of raw materials	Leakage	2	2	4
		Air pollution	2	2	4
9	Condensation of pyrolysis oil	Leakage	2	2	4
		Air pollution	2	2	4
10	Disposal of residue	Spillage and causes water / soil pollution	1	2	2

Table 7.23: Results of Risk Reference Analysis

No.	Activity	Process	TE	ETE	F	L	Consequence			Risk Score
							I	EP	EA	
1	Collection and transportation of raw materials and finished goods	Transportation of raw materials & finished goods	Leakage	Spill	16	2	1	1	2	64
			Vehicle accident	Spill	16	2	1	1	2	64
2	Storage and handling in the plant	Handling of raw materials & finished goods	Accident	Spill	16	2	1	1	1	32
3	Wire stripping of steel wires	Stripping steel wires from rubber tire wastes	Accident	Injury	16	1	4	1	1	64
			Leakage	Spill	16	2	1	1	1	64
4	Crushing of rubber tire wastes	Crushing of tires with variety of sizes	Leakage	Spill	16	2	1	1	2	64
			Accident	Injury	16	1	4	1	2	128
5	Blending of sludge	Blending of decanter and POME sludge	Accident	Injury	16	1	4	1	1	64
			Leakage	Spill	16	2	1	1	1	64
6	Flaring chamber (APCS 1)	Treatment of air flow during condensation	Leakage	Spill	16	1	4	1	1	64
			Accident	Injury	16	1	4	1	1	64
7	Wet scrubber (APCS 2)	Treatment of air flow during pyrolysis	Leakage	Spill	16	1	4	1	1	64
			Accident	Injury	16	1	4	1	1	64
8	Pyrolysis of raw materials	Pyrolysis of raw materials	Leakage	Spill	16	2	1	1	2	64
			Accident	Injury	16	1	4	1	2	128
9	Condensation of pyrolysis	Condensation of pyrolysis oil	Accident	Injury	16	1	4	1	1	64
			Leakage	Spill	16	2	1	1	1	64

10	Disposal of residue	Spillage and causes water / soil pollution	Leakage	Spillage	16	2	4	1	1	128
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7.7.2.4 Risk Management and Communication

a. Managing Risk

The hazards due to the Project are more likely to be caused by accidents and human error. These can be mitigated by establishing a good working culture in the Plant and by developing a responsible and focused work force.

Most of the materials are not very toxic (base on LD₅₀) unless ingested in large enough volumes. They may, however, cause skin, eye, and nose and throat irritation when in direct contact or inhaled.

To minimize the risk associated with this Project, procedures and education on the effective application of these procedures must be given priority in the operation. The following procedures are necessary:

- (i) transport routing and vehicle checking;
- (ii) storage and handling of wasted;
- (iii) safety practices for workers; and
- (iv) health monitoring of workers.

When the workers are all operating according to proper procedures and they are careful and conscientious in their work, the risk of accidents happening will be greatly reduced.

b. Communication

For this Project, it is not necessary to communicate the potential hazards and risks to the general public or even to the surrounding industries. There is however, a need to inform all the workers and personnel working in the Plant so that they are aware of all likely potential hazards and how to conduct themselves so as to prevent these from occurring. Even when a hazard has occurred, they should be familiar with the right procedures to minimize adverse impacts.

Staff training and a familiarization tour of duty are areas where this communication can be formally imparted. During these sessions, it is good practice to also provide document handouts on all the procedures, rules and regulations that they need to strictly comply with. All relevant instructions should also be placed in prominent areas of work to facilitate easy access.

c. Emergency Response Plan (ERP)

The emergencies encountered are due mainly to accidents during transportation of raw and finished products to and from the Plant. An ERP will be drawn up to show workers how to respond quickly and effectively to:

- (i) spillage on roads and in the Plant; and
- (ii) injury to workers and the public.

The aim of the ERP is to minimize the consequences of the impact on the environment as well as on the workers or public involved.

d. Incident/Accident Reporting

When an incident/accident occurs, it is recommended that the following sequence of steps be followed as shown in **Figure 7.15**, leading to formal notification and reporting using forms suggested in **Figures 7.16 and 7.17**.

7.7.2.5 Conclusion on Risk Assessment

This risk study was carried out to the stage of qualitative risk assessment as the results indicate that the risks of the potential hazards from the Project are not large and significant to necessitate further quantitative risk assessment.

The risk of each of the hazards, with recommended amelioration measures fully adopted, is well within the range of acceptable tolerance.

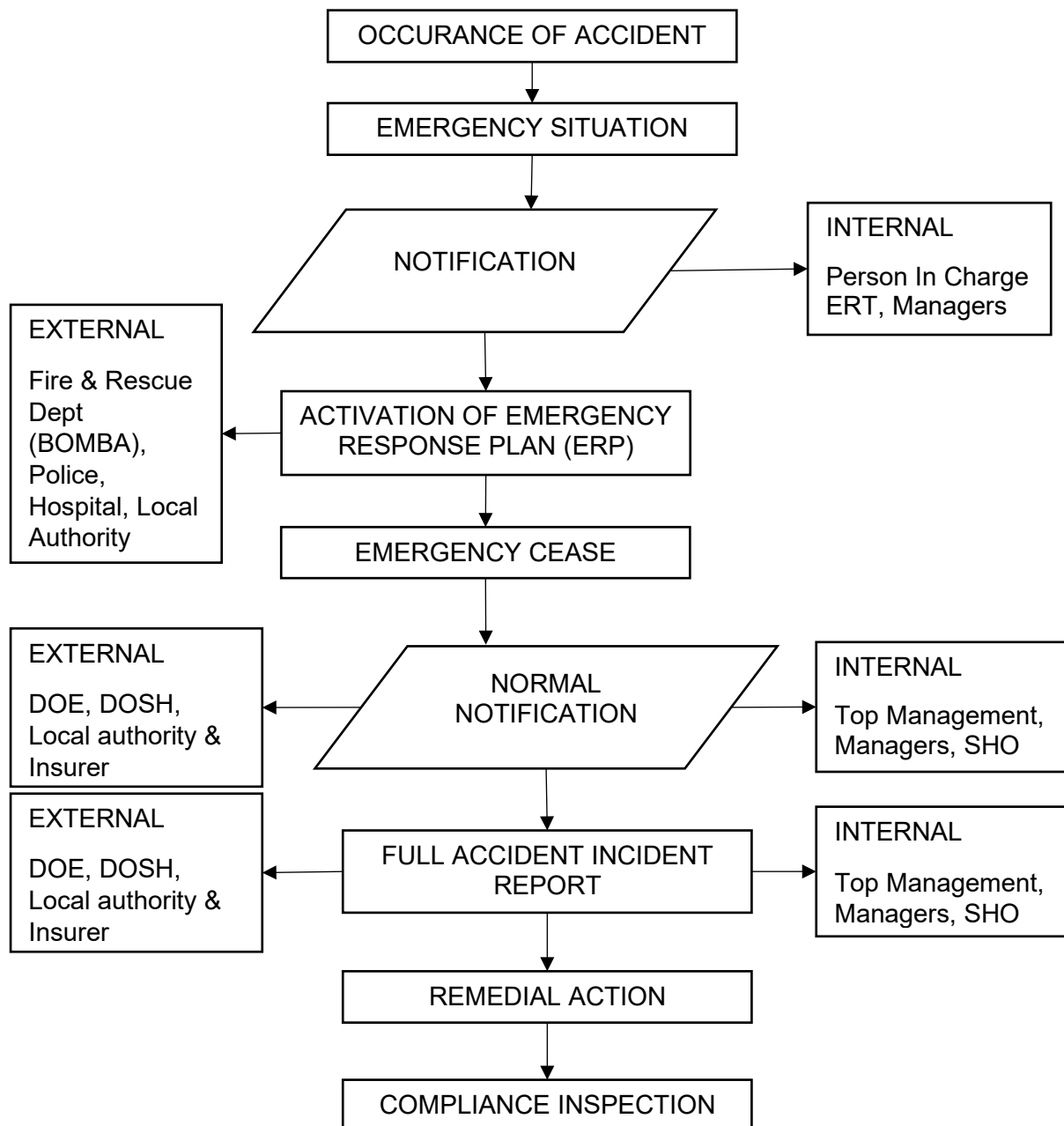


Figure 7.15: Accident Notification and Reporting Flowchart

DOE	ACCIDENT/INCIDENT NOTIFICATION FORM					Acc Rpt FORM #1
A	CATEGORY OF INCIDENT/ACCIDENT (If Major accident, please specify immediate actions taken)					
	Major accident		Minor accident		Fatality/injury	
	Immediate actions taken:					
B	LOCATION OF INCIDENT/ACCIDENT (Tick () ONE only)					
	Inside Plant/ Processing Area		At Storage Area		During Transportation	
C	GENERAL INFORMATION					
Accident date	Time (start)	Time (end)	Full address	Type of industry (Tick () ONE only)		
					Petroleum	
					Gas)LPG)	
					Oil & gas	
					Petrochemical	
					Chemical (toxic)	
					Other (.....)	
D	TYPE OF ACCIDENT (Tick () ONE only)					
Explosion		Falling Object		Near miss		
Fire		Mechanical		Other (....)		
Spillage		Electrical				
Loss of containment		Slip/Fall				
E	DETAILS NUMBER OF CASUALTY (If applicable)					
Number	Employee	Contractor	Third Party	Total	Note	
F	ESTIMATION OF LOST					
Property loss RM	Repair/replacement cost RM		Other loss RM			
G	APPROVAL OF INCIDENT/ACCIDENT REPORT					
	Name and designation	Signature	Date	Remark		
Prepared by						
Chec						

ked by				
Appro ved by				
H	FOR OFFICIAL USE ONLY			
Date of receipt		Received by		Action taken/ Comment

Figure 7.16: Incident / Accident Notification Form

DOE	SUMMARY OF INCIDENT/ACCIDENT INVESTIGATION REPORT					AccRpt FORM #2
A	CATEGORY OF INCIDENT/ACCIDENT (If Major accident, please specify immediate actions taken)					
	Major accident		Minor accident		Fatality/inj ury	
	Immediate actions taken:					
B	LOCATION OF INCIDENT/ACCIDENT (Tick () ONE only)					
	Inside Plant/ Processing Area		At Storage Area		During Transportati on	
C	GENERAL INFORMATION					
Accident date	Time (start)	Time (end)	Full address	Type of industry (Tick () ONE only)		
					Petroleum	
					Gas)LPG)	
					Oil & gas	
					Petrochemical	
					Chemical (toxic)	
					Other (.....)	
D	TYPE OF ACCIDENT (Tick () ONE only)					
Explosion		Falling Object		Near miss		
Fire		Mechanical		Other (....)		
Spillage		Electrical				
Loss of containment		Slip/Fall				
E	DETAILS NUMBER OF CASULATY (If applicable)					
Type of injury	Employee	Contractor	Third Party	Total	Note	
Fatality						
Permanent total disablement						
Permanent partial						

disablement					
Temporary total disablement					
Temporary partial disablement					
Medical treatment case					
First aid case					
F	DETAILS OF CHEMICAL INVOLVED				
1. Name (IUPAC, Transportation number)				Quantity	
2. Name (IUPAC, Transportation number)				Quantity	
G	ESTIMATION OF LOST				
Property loss RM_____	Repair/replacement cost RM_____		Other loss RM_____		
H	PROBABLE CAUSE/S (Tick (□) at appropriate box)				
Process failure		Human failure		Electrical failure	
Material failure		Mechanical failure		Other (please specified)	
I	MITIGATION/RECOMMENDATION				
Short term					
Long term					
J	APPROVAL OF INCIDENT/ACCIDENT REPORT				
	Name and designation	Signature	Date	Remark	
Prepared by					
Checked by					
Approved by					
K	FOR OFFICIAL USE ONLY				
Date of receipt		Received by		Action taken/Comment	

Figure 7.17: Summary of Incident / Accident Investigation Report

7.8 SOCIO ECONOMY

The key findings of the socio-economic survey are elaborated in the following sections.

7.8.1 Opinions and Perceptions of Respondents

7.8.1.1 Project Awareness Level

The level of knowledge of the respondents regarding the project proposal shows that 100% do not know about the project (**Table 7.24**). This is likely due to the lack of physical indications (notice boards, land clearing, etc.) of the proposed development of the project.

Table 7.24: Awareness and Knowledge About the Proposed Project

Awareness and Knowledge	Percentage (%)
Know about the project	-
Don't know	100.0
Not sure	-

Source: Field Data, August 2023

7.8.1.2 Perception of the Socio-Economic Impact of the Proposed Project

This study was conducted to measure the perception of local residents about the impact of the project, especially in relation to various environmental components. One of the perceptions seen is the advantages and disadvantages of the proposed socio-economic impact of the project as listed in **Table 7.25**. If the total percentage is 60% or more, it is considered significant.

Table 7.25 shows the analysis of the responses shows a strong agreement among the respondents that the project will bring many advantages or positives to them except for increased business opportunities, opportunities for home ownership, marginalization of existing residents will occur, and the probability of local residents will be marginalized if the project this is carried out. Nevertheless, this project was given a good value by the respondents because the negative effects or lacks did not happen to them such as loss of job, loss of source of income, displacement, and loss of property.

The data obtained shows the respondents' concerns. In particular, the majority of responses focused on the category Marginalization of existing populations and concerns about the Likelihood of local residents being marginalized.

Table 7.25: Evaluation of Socio-Economic Advantages and Disadvantages of the Project Proposal

Perception	Percentage (%) said Yes
Advantage:	
Increase employment opportunities for members of own households	66.67
Increase employment opportunities for people in the area	94.33
Improve basis amenities in the area	83.67
Increase the value of landed properties	66.67
Increase standard of living	69.67
Increase business opportunities	29.67
Increase property ownership opportunities	34.33
Disadvantage:	
Losing a job	-
Loss of source of income	-
Displacement	-
Loss of property	-
Marginalization of the existing population	82.67
Probability of local people being marginalized	82.67

Source: Field Data, August 2023

7.8.1.3 Perspectives on Health and Safety Impacts

The figure below shows how the community sees the impact of the project on their health and safety. As can be seen, respondents feel worried if there is no enforcement of the law, which is the increase in air pollution received the highest score (67%) followed by water pollution (63%), noise pollution and traffic congestion (60%).

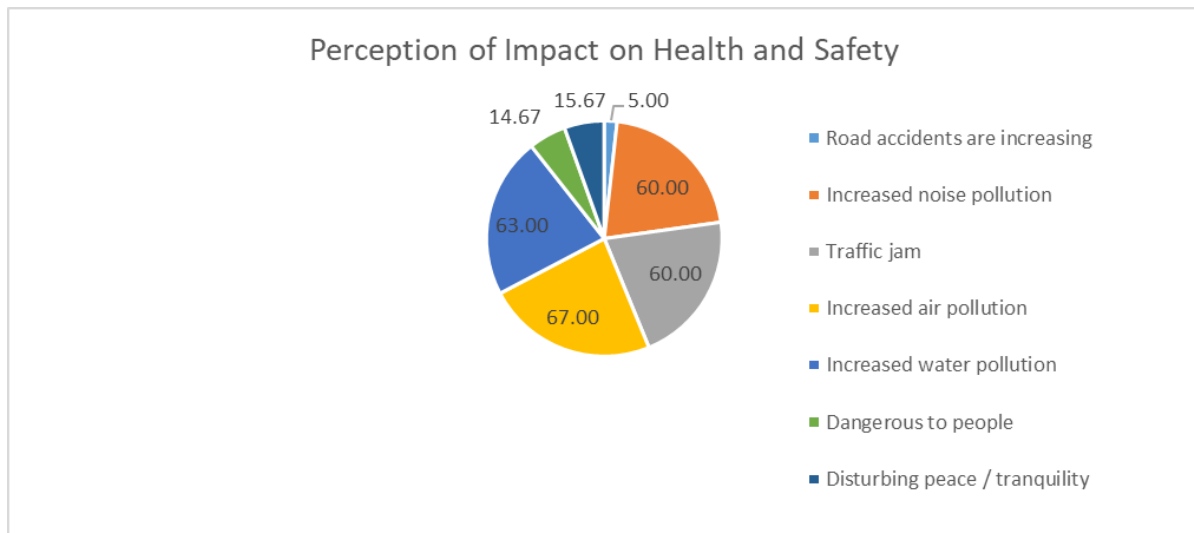


Figure 7.18: Assessment of Impact Perception on Health and Safety

Source: Field Data, August 2023

7.8.1.4 Perception of Impact on Aesthetics and Culture

Analysis of the perception of the impact on aesthetics and culture shows that a number of respondents feel the impact on the quality of aesthetics and culture in the area. It can be concluded when more than 60% think the project will affect the shape of the land in the project area, the beauty of the landscape, air quality and also the quality of river water (**Figure 7.19**). The respondent's perception states that the authorities do not conduct strict monitoring on a regular basis and do not take immediate action if there are complaints from residents.

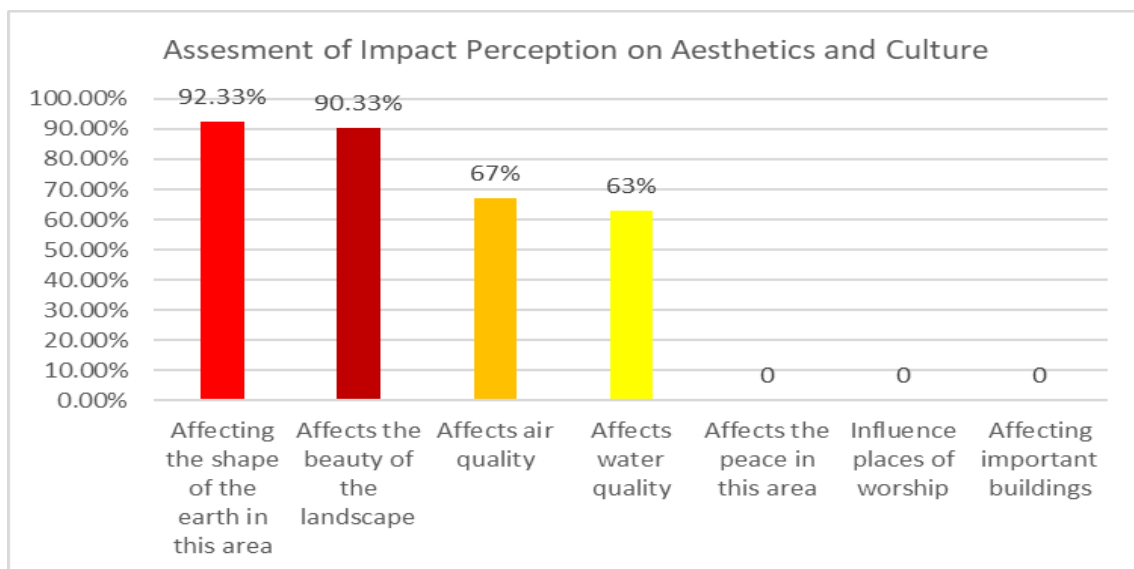


Figure 7.19: Assessment of Perception of Impact on Aesthetics and Culture

Source: Field Data, August 2023

7.8.2 Project Evaluation and Local Community Acceptance

Respondents were also asked how they view and evaluate the Project Proposal by evaluating the overall perception of whether it will bring more positive or negative effects.

The results of the analysis show that the data obtained describes the distribution of positive and negative impacts in the two different zones (Zone 1 and Zone 2) of the entire area. By percentage, Zone 1 shows a positive perception with 78% and 22% showing a negative effect. Zone 2 reflects higher positive sentiment, with 83% of respondents feeling the impact positively and only 17% reporting negatively.

When considering both zones together, the collective data shows an overall positive effect, with 79.67% of respondents seeing it as positive and 20.33% seeing it as negative (**Figure 7.20**).

Based on the level of acceptance of the project, it can be seen that there is an overall agreement that all zones that evaluate the project are the same as receiving positive or negative impacts. This finding shows that both zones generally accept The Proposed Pyrolysis Plant At Lot 225111, Jalan Gopeng, Tungzen Industrial Park, Mukim Sungai Raya, 31300 Kampung Kepayang, Perak Darul Ridzuan (**Figure 7.20**).



Figure 7.20: Overall Perception of Project Proposal Impact and Acceptance Level Based on Zone

Source: Field Data, August 2023

Among the reasons agreed upon is because it provides job opportunities to the public, far from the population settlement and become an economic resource for the state government as well as local small businessmen.

Those who do not agree also feel that there will be water and air pollution as the main factor, followed by disturbance of flora and fauna during the construction process as well as resulting in disturbance to the natural ecosystem, water pollution occurs from the resulting waste and worry about mud flash floods, worry about health, disagree if it causes problems for residents and the presence of foreign workers (**Table 7.26**).

Respondents were finally asked if they had other opinions about the proposed project. Various responses were received (**Table 7.27**).

Table 7.26: Reasons for Agreeing and Disagreeing

Reason for agreeing (n=239)	%	Reasons for not agreeing (n=61)	%
Reduce pollution and used tire piles.	21.76	Worry about health problems in the future.	34.31
This will indirectly ensure that resources are managed well.	18.41	Smoke, noise, and water pollution can occur. Environmental pollution is feared to occur.	29.51
The proposal is in an industrial area.	51.05	Not sure because the operating factory is located in an industrial zone, it may be the effect of those who live nearby.	19.67
Public employment opportunities.	4.6	Do not agree if it causes problems for the residents and the presence of foreign workers.	16.39
Opportunities for local businesses.	4.18		

Source: Field Data, August 2023

Table 7.27: Other Opinions About the Project Proposal

Opinions
Monitoring of Environmental pollution should be monitoring Present an environmental management plan to the affected population Monitoring by the authorities should be available on a daily basis Using technology that does not disturb the peace of the people

Source: Field Data, August 2023

7.8.3 Implementation of Mitigation Measures

Implementation of mitigation measures are to ensure that existing communities in and around the Project area are not affected indirectly during the construction and operation phase. Where the issue is an environmental problem and not addressed properly, the problem can be magnified. Therefore, project implementation requires more liaison cooperation between community leaders and local authorities.

The monitoring program itself should be carried out by qualified people. The frequency and purpose of monitoring can prevent future environmental problems in the long term. For community satisfaction, a mechanism is proposed, in the form of a Community Committee that acts as a platform not only to monitor the correct implementation, but also acts as a contact and clarification center for all complaints and matters related to the affected social environment and the community itself. This can indirectly ensure proper monitoring of the project. This can act as a first stop center for all complaints and inquiries help to set employment targets, environmental related complaints, as reference records such as housing statistics, land use data, population statistics and labor records.

It can be concluded that the proposed project can be carried out when the main issues, especially related to the local community as well as environmental management and Corporate Social Responsibility (CSR) efforts, ethical conduct and emphasis on environmentally friendly operations are carried out in a carefully planned and managed context. A project that will ultimately benefit the regional growth of the well-being of the local population.

7.8.4 Conclusion

The social profile of the population in general, the characteristics of the population in the study area has a young age structure and consists of educated adults. The majority of respondents are employees, especially those who work in the private sector, and some are self-employed and run businesses. In general, respondents rated the proposed project as agreeing with the project proposal.

It can be concluded that the proposed project can be carried out when the main issues especially related to the local community as well as environmental management efforts and Corporate Social Responsibility (CSR), ethical behavior and emphasis on environmentally friendly operations are carried out in a carefully planned and managed context. A project that will ultimately benefit the regional growth of the well-being of the local population.



Figure 7.21: Pictures of the Survey Activities Carried Out

Source: Field Data, August 2023

CHAPTER 8

MITIGATION MEASURES

CHAPTER 8 : MITIGATION MEASURES

8.1 INTRODUCTION

The potential significant impacts the Project will have on the environment have been discussed in the previous Chapter. To prevent or minimize these significant impacts on the environment, it is necessary to include pollution prevention and mitigation measures (P2M2) as an integral part of the Project in its implementation.

The P2M2 will be discussed accordingly to the Project operation, to the extent the Consulting Engineers can design and cost any structural mitigating measures required.

The P2M2 will be proposed accordingly for the operation phases for the identified impacts. In formulating these P2M2, the following principles are referred:

- (a) Avoid the impact altogether by not taking a certain course of action;
- (b) Minimize the impact by limiting the degree or magnitude of the action;
- (c) Rectify the effect by repairing, rehabilitating, and restoring the adversely affected environment;
- (d) Reduce and/or eliminate the impact over time by preservation and maintenance operation over the life time of the Project; and
- (e) Compensate by replacement or substitution of affected resources.

The Project Proponent (PP) will be responsible for the implementation and management of the proposed P2M2 which will be included as an integral part of the Project plan.

8.2 DURING OPERATIONAL PHASE

All the processes in the Plant have been designed and operated in a manner to minimize their impacts on the environment and on the health and safety of workers; the latter is required to comply with the regulations of the Department of Occupational Safety and Health (DOSH). Adverse impacts may still arise, however, due to human error and accident during transport of raw materials or chemical substances and handling within the Plant. To a much lesser extent, equipment failure like the APCS not functioning properly may cause adverse impacts to occur. When adverse impacts do manifest, the ultimate effects will be mainly on air and pollution as well as injury to workers.

The best way to mitigate accidents and human errors is to establish clearly defined detailed operating procedures for every activity of the Project. These formalized procedures should be presented in the Project's Operation Manual and be given to all key operation staffs. These procedures should be communicated to all staff and workers in regular training courses. The Project should have a planned maintenance schedule to inspect, maintain and repair all equipment and systems in the Plant regularly for optimal performance.

The following discussions will be confined to the various hazards that may contribute to adverse impacts and their proposed mitigation measures. These hazards will manifest as adverse impacts due mainly to human error and accident episodes.

8.2.1 Handling Hazard

Handling of scheduled wastes will have to abide by and satisfy all the requirements of the Department of Environment (DOE). Therefore, to handle, transport, store, use and dispose of scheduled waste (a type of solid waste), a formalized procedural report must be drawn up in line with the regulations of DOE.

When a spillage occurs, resulting in the release of chemicals into the environment, the emergence response plan (ERP) must quickly be activated to prevent adverse health and safety effects on the human population and to mitigate any possible deleterious effects on the environment.

Proposed P2M2 for Storage and Handling of Waste

- a. All machinery and systems used in the reaction, filtering and packing processes will be regularly and frequently inspected, maintained and if found faulty, to be repaired immediately.
- b. No smoking practice is to be strictly enforced within the Plant.
- c. No lighters, matches, or sparking devices will be allowed within the Plant.
- d. Protective gloves, safety goggles and boots, and other protective clothing have to be worn whenever necessary.
- e. An ERP has to be drawn up for major spills or fire. Personnel will be trained and assigned responsibilities to deal with such emergencies. Regular drills and exercises will be conducted to gauge the state of preparedness.

8.2.2 Transport Hazard

During transportation, there is possibility of spillage and discharge caused by road accident or careless driving. The impact can be significant and therefore P2M2 must be implemented to prevent the negative effects as the following:

Proposed P2M2 for Transport of Scheduled Waste

- a. A good logistic transport plan shall be established to identify routes to be used that avoid congested and high traffic volume areas.
- b. All transport vehicles are to be road-worthy and equipped with cleaning up equipment and facilities to deal with spills.
- c. The serviceable condition of all transport vehicles should be checked each and every time before they begin their trip.

Proposed P2M2 for Spillage or Accidental Discharge of Scheduled Waste

- a. The PP shall do everything possible and practical to contain, cleanse and abate any accidental spillage or discharge as soon as possible.
- b. All assessment and remediation activities shall be conducted in accordance with a work plan approved by the regulatory agency having oversight of the activities.

8.2.3 Air Pollution

Based on the modeling results, it is anticipated that the impact on atmospheric environment due to the proposed recovery plant is expected to be insignificant with installation of air pollution control system (APCS). The plant will have two (2) APCS. The proposed wet scrubber is basically a system made up of enclosed suction and ducting system, exhaust fan and chimney. The system ensures flue gas generated from the pyrolysis and condensation process is being filtered. A chimney shall be designed and installed where applicable to assist the gas removal process.

In addition, the emission of pollutants from the road traffic also are not considered significant through implementation of a traffic management plan.

Nevertheless, the following mitigation measures are essential to be implemented during the Project operation:

Proposed P2M2 for Air Pollution

- i. Regular maintenance of air pollution control system (APCS) should be carried out to ensure its operating efficiency. A maintenance/inspection schedule should be established for this purpose.
- ii. Oil manufacturing is to be carried out within building with proper fugitive dust control system.
- iii. All sources emitting dust and air pollutants from crushing activities and waste processing operations should be equipped with effective pollution control system.
- iv. Conveyor system which is not operated within enclosed (housed) environment should be covered, as practicable as possible.
- v. Ensure that the buffers are planted with trees that will act as air filters and heat sinks in the area.
- vi. Maintain good housekeeping practices throughout the operational phase.
- vii. Maintain good solid waste management.
- viii. Quarterly monitoring of the air quality should be conducted throughout the operational period to determine the effectiveness of the air control system.
- ix. Impose speed limit and traffic volume restriction to reduce dust churned by vehicles.

The current design and operation of the APCS, which comprises of a variety of different components is essentially a mechanical, physical system based on performance assurance from system designer with previous and related experience in as explained in **Chapter 5**. Continual improvement on the APCS shall be done when and where require ensuring the purified air quality meets DOE emissions standards made under the Clean Air Regulations 2014. Periodic analytical testing on the treated effluent samples will be recorded and analyzed to obtain early sign if any when the treatment efficiency has not performed as expected.

In addition to that, the Project Proponent will install a CEMS (continuous emission monitoring system) to monitor the emission quality from the exiting chimney with the parameters to be monitored shall include the items listed in the table below. The various APCS installed at the project site will have an operational efficiency of 99% and the operational efficiencies are illustrated in the figured below.

Table 8.1: Operational Efficiencies of APCS

No.	Parameter	Limit Value	Monitoring
1.	PM (Particulate Matter)	5 mg/m ³	Continuous
2.	Sum of NO and NO ₂ expressed as NO ₂	500 mg/m ³	Periodic

8.2.4 Noise Pollution

The main source of noise during the operational phase will be from vehicles to and from the site and operation of the scheduled waste and metal wastes processing equipment & machinery such as separator shaker machines and crusher. However, the noise level generated is expected within the acceptable limit and its impact to the surrounding environment is insignificant.

The following are the recommended mitigation measures during Project operation:

Noise from Scheduled Waste Processing Equipment & Machinery

- a. Enclosure of processing plant with brick wall with several opening to allow for access.
- b. Ensure regular maintenance of processing equipment and machinery.
- c. A maintenance programme/schedule should be established to inspect and maintain the vehicle and machinery periodically in particular the principal noise sources.
- d. Provide workers with the PPE (earmuffs, etc.) and undergo regular audiometry checking.

Traffic Noise

- a. Natural vegetation and buffer along the Project boundary and main roads should be maintained to act as noise barriers.
- b. Road condition to be regularly maintained to ensure smoothness of road surface and repair of potholes to reduce excitation of wheel-road noise.
- c. Setting up of noise limits and speed control measures would help reduce the overall noise from traffic.

8.2.5 Water Pollution

8.2.5.1 Sewage

For sewage management, sewage from the Project site shall be conveyed to regional sewage treatment plant (STP) operated by IWK. The STP shall comply with SPAN (Suruhanjaya Pengurusan Air Negara) guidelines and specifications. This is part of the mitigation measures for control of water pollution. The on-site and off-site mitigation measures to control and minimize water pollution during the operational phase can include structural and non-structural measures which are summarized below:

- a. The sewage water conveyed to the regional STP should be treated to the design quality or at least Standard A of the Environmental Quality (Sewage) Regulation 2009, as stipulated in the Environmental Quality Act 1974;
- b. Regular servicing and maintenance should be conducted on the sewerage piping system to ensure no raw sewage is discharged into the river system due to leakage and functional failure.
- c. No wastewater to be discharged from the premises. The water used in the process will bond with aggregate and sand to become brick.
- d. Oil trap and sump will be installed before the final discharge point to the public drain.
- e. The sump will allow sedimentation of suspended solid from the factory surface runoff (if any).

8.2.6 Fire Hazard

The following P2M2 are recommended:

- a. A central fire-fighting system with sirens and a fire-fighting hose reel installed.
- b. Regular maintenance and inspection of this system to ensure workability and reliability.
- c. Fire extinguishers are to be placed at strategic locations for use in isolated fire episodes.

When a fire episode occurs, fire-fighting response procedure must be carried out as follows:

- (i) If fire occurs in the Plant, an alarm must be triggered, and all workers and staff assemble in an identified safe location (or assembly point) for further instructions by appointed person responsible for fire-fighting.

- (ii) Any flammable items in or near the vicinity of the fire zone will be moved to a safer location if possible.
- (iii) Trained fire-fighters operating the extinguishers or water hose reels to be properly attired for safety.

8.2.7 Safety Hazard

All the health and safety procedures of OSHA Regulations 1994 will be adopted in the handling of machinery and chemicals. The safety measures are:

- a. Each operator will be provided with one set of personal protective equipment.
- b. Education and training on the following safety procedures will be given:
 - (i) Handling of raw materials and finished products;
 - (ii) Handling spillage, fire and explosion.
- c. PP also should consider work at height and tripping hazard by carried out the Hazard Identification, Risk Assessment and Risk Control (HIRARC).

An ERP shall be drafted and formalized before the implementation of the Project.

8.2.8 Waste Management

The following are the proposed mitigation measures in managing scheduled and non-scheduled waste during operational phase:

Non-scheduled Waste: Municipal Waste, Green/Landscaping Wastes

- a. Solid waste that are not classified as scheduled waste should be stored separately within the premise and later collected and disposed of to the nearest landfill site.
- b. Collection and disposal of solid waste should be on a regular basis to ensure cleanliness.
- c. Regular cleaning of drains and waste disposal sites to ensure cleanliness and aesthetics.
- d. Spilled wastes on the roads should be cleared and washed immediately.
- e. Continuously adopt measures to reduce waste production.
- f. Turf grass clippings and landscape yard wastes should be composted if possible and used as mulch or collected and disposed at the nearest licensed landfill.

Scheduled Wastes

- a. There will be very little scheduled wastes will be generated. If there are scheduled wastes generated, they must be handled as stated in the Environmental Quality (Scheduled Wastes) Regulations 2005 (Amendment 2007).
- b. Personnel handling scheduled wastes must be a certified scheduled waste competent person.
- c. PPE must be worn while handling scheduled waste.
- d. Scheduled waste storage area must be equipped with bunding in case of leakage and spillage.
- e. Flammable, hazardous and combustion materials must be separated in designated storage areas.
- f. Emergency safety measures must be put in place in case of chemical spills and accidents, such as spill clean-up kit, first aid facilities, fire alarm and extinguishing facilities, etc.

8.2.9 Traffic Management

The following are the proposed mitigation measures in traffic management during operational phase:

- a. A systematic traffic management plan shall be prepared.
- b. Operating of the prime mover should be scheduled slightly away from the peak hours.
- c. Put up signages for smooth traffic flow with proper speed limit.

8.2.10 Health and Safety Hazards

Mitigation proposals are particularly important as they provide guidance for mitigation efforts on anticipated and unanticipated socio-economic impacts.

- I. Employment / Economic Impact and Material Welfare:
 - Locals are given priority in the recruitment process.
 - Local jobs generate local income which can stimulate business and trade or the local economy through a multiplier effect with the expansion of new types of businesses and services, new labour needs, new housing and so on thus improving the economic position of locals and them. living standards.

- By having good access facilities and transportation routes, the value of properties in the local area will increase.
- II. Environmental Quality:
- Using the latest environmentally friendly technology.
 - Comply with the recommendations of the authorities and protect the environment.
- III. Environmental Amenity Value / Aesthetic Quality:
- Landscaping and replanting with suitable plants and shrubs to soften the effects of visual disturbance.
- IV. Quality of Living Environment / Public Welfare:
- Foreign workers need to be checked for health status to avoid possible spread of epidemics among workers.

Table 8.2 gives a summary of issues and proposed P2M2 for this Project.

Table 8.2: Summary of Impacts and Recommended P2M2

Impact	Sources of Impact	Degree of Impact	Proposed P2M2
Operational Phase			
1. Water/Soil Pollution due to Handling	Spillage and accidental discharge.	Can Be Significant	• Safe storage and handling of scheduled wastes. • Use durable drums, boxes or jumbo bags for containment. • Store all raw materials in compliance with good practice guidelines. • Check incoming feedstock to ensure acceptance based on waste acceptance criteria.
2. Water/Soil Pollution due to Transportation	Spillage or accidental discharge of raw materials and finished goods transportation.	Can Be Significant	<u>Transport of Scheduled Wastes</u> • Prepare a logistic and routing plan. • All vehicles to be equipped with cleaning up facilities. • Check condition of the trucks before use. <u>Accidental Spillage or Discharge</u> • Use appropriate personnel protective equipment (PPE) to provide protection for workers in handling any accidental spillage. • The contractor/PP to contain, clean and abate any accidental spillage or discharge of the waste as soon as possible. • Transport route to avoid densely populated areas, water catchment areas and other environmentally sensitive areas.

3. Fire Hazard in the Plant	Accidental ignition of fuel used for pyrolysis reactor.	Can Be significant	• Have a well-rehearsed ERP that can be put into effect at short notice. • A fire-fighting system with sirens to be installed. • The system is to be regularly inspected and maintained. • No smoking and prohibition of matches, lighters and other ignition devices in the Plant. • Firefighters, when required, to wear proper protective equipment and self-contained breathing apparatus. • To call the fire stations when needed. • All enclosed rooms should be fitted with fire rated doors for at least one hour. • Fire extinguishers should be placed at various strategic locations for easy access.
4. Scheduled Waste / Residual Waste / Sludge	Rejects from refined oil manufacturing process.	Can Be Significant	• Scheduled wastes generated from the refined oil manufacturing process shall be stored in suitable containers, labelled and then disposed at Kualiti Alam (KA). • Rejects/Residues from refined oil manufacturing process shall be stored in suitable container and then disposed at approved landfill for non-scheduled wastes. • Sludge (SW204) shall be stored in suitable container and then disposed at Kualiti Alam (KA). • The storage area must be roofed to prevent entry of rainwater and must be ventilated adequately.

5. Solid Waste	Domestic waste.	Insignificant	Domestic waste will be managed by local authority and disposed at their designated landfill.
6. Noise Pollution	- Caused by transport vehicles during the operation. - Reactor, pumps and exhaust fan operations.	Can Be Significant	- Ensure that all operation equipment has functional exhaust systems. - Exhaust fan shall function adequately throughout the pyrolysis process operation, with regular service and maintenance.
7. Air Pollution	Emission of hazardous gases and particulate matters from chimney (APCS).	Can Be significant	- Maintenance of all air pollution control equipment in the Plant. - Performance monitoring of the air pollution emissions by conducting periodic monitoring, as well as CEMS (continuous emission monitoring system) for important parameters.
8. Health and Safety Hazards	During operation.	Insignificant	- To adopt industrial safety procedures given in the OSHA Regulation 1994. - Safety Data Sheets to be kept on site for inspection. - Emergency procedures, action plans and regular drills to be executed. - No smoking allowed within the Plant. - Workers, when necessary, to wear protective gloves, safety goggles and other protective clothing. - Train certain workers to provide first aid and have available easily accessible first aid kits.

			• Intensive training on safety procedures should be provided for all personnel.
9. Socio-Economy	• Employment. • Environmental aesthetics. • Public welfare.	Insignificant	• Local to given priority in recruitment process. • Landscaping and replanting with suitable plants and shrubs. • Foreign workers need to be checked for health status to avoid possible spread of epidemics among workers.

8.3 RESIDUAL IMPACT

8.3.1 Introduction

This Section examines the residual environmental impacts that could arise despite all mitigation measures being taken. The main residual impacts are likely to be from ambient noise level and air pollution level during the operation phase.

8.3.2 Residues

All residual wastes from the recovery processes such as rejects from refined oil manufacturing will be collected and stored prior to transfer to approved landfill for disposal.

8.3.3 Solid Waste

Solid waste generated by the proposed Project includes only domestic waste, which will be collected by the local authority and disposed of at designated landfill.

To prevent unpleasant odor being generated and the solid wastes being a source of infestation from vermin, the solid wastes should be properly contained in covered containers, and they should be disposed from the Plant at least twice a week.

8.3.4 Noise Pollution

It is envisaged that the machines used in the proposed Project will not generate significant noise. Noise from the movement of transport vehicles will be intermittent and low.

8.3.5 Air Pollution

The gaseous and dust emissions from the refined oil manufacturing process after treatment through the air pollution control system (APCS) in the form of particulate matters, SO₂ and NO₂ gases are low. Dust generation due to movement of vehicles to and from the site is intermittent.

8.3.6 Water Pollution

There is no wastewater generated from the manufacturing lines. The pyrolysis facility shall have no water treatment system as the raw materials received are in clean condition hence there is no need to wash them.

CHAPTER 9

ENVIRONMENTAL MANAGEMENT PLAN (EMP)

CHAPTER 9 : ENVIRONMENTAL MANAGEMENT PLAN (EMP)

9.1 INTRODUCTION

Environmental Management Plan (EMP) is a mechanism designed for effectively managing and monitoring environmental impacts of a proposed development to as low as reasonably practicable (ALARP). The EMP forms the key guidance document for Guided Self-Regulation (GSR) for environmental management during the implementation of the Project. The EMP not only outlines key strategies and actions on environment pollution prevention and mitigation measures (P2M2) but also outlines monitoring and reporting requirements to enable the assessment of the effectiveness of P2M2 in addressing the identified potential impacts.

An EMP shall be prepared based on the findings of the EIA and the requirements stipulated in the EIA approval conditions. It shall also be prepared in accordance with DOE's Guidance Document for Preparation and Submission of Environmental Management Plan and, as a minimum, incorporate the following information:

- Objectives of the EMP;
- Environmental policy;
- Organization structure with roles and responsibilities for EMP implementation;
- Training requirements;
- Environmental requirements particular EIA approval conditions;
- P2M2 and budget for implementation;
- Environmental commitments during various Project phases;
- Monitoring, auditing and reporting requirements; and
- Project Closure/Abandonment Plan.

This section presents the EMP framework of proposed Project, which is formulated via the following processes:

- Identification of key Project activities and the environmental impacts pertinent with the Project activities as detailed in **Chapter 7** of this report;
- Identify action plan required for execution in order of implementation of P2M2 in reference to impact findings and mitigation measures proposed in **Chapter 8** of this report;

- Assign responsibilities for the management of the EMP for the proposed Project including competence person and training requirements;
- Estimate budget allocation required for the P2M2 implementation; and
- Establishing appropriate standards and procedures for monitoring the environmental impacts which includes Performance Monitoring (PM), Compliance Monitoring (CM) and Impact Monitoring (IM).

The overall framework is also demonstrated below and the criteria that are intended to serve as an agenda for the development of the detailed EMP upon approval of the EIA are discussed in the following sub-sections.

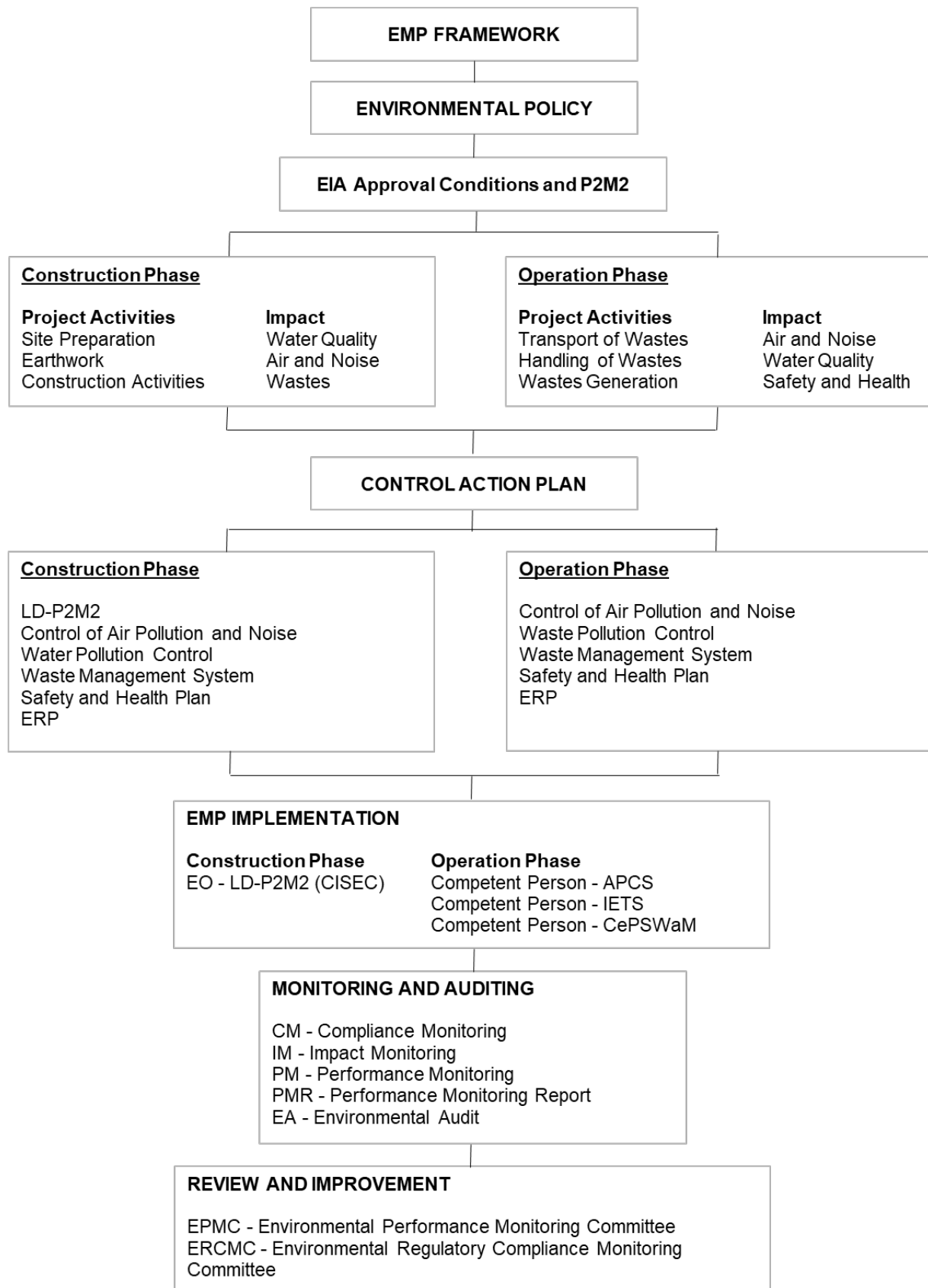


Figure 9.1: EMP Framework

9.2 OBJECTIVE OF THE EMP

The main purpose of the EMP is to ensure proper implementation of all remedial activities on-site and off-site at various Project phases. It aims to:

- Providing a framework adopting GSR system to manage the adverse environmental impacts caused by the development of the proposed Project;
- To ensure that works carried out are complying to EIA approval conditions in particular and conformance to Environmental Quality Act (EQA) 1974 and its regulations and/or guidelines pertaining to the Project activities;
- Assigning environmental management responsibilities to the parties involved in the development and operation of the proposed Project;
- To identify action required to be executed in order for implementation of P2M2;
- Providing a mechanism to evaluate the performance, compliance and impact of the environmental management and practices onsite by means of environmental monitoring and audit program; and
- Providing opportunity for continuous environmental management improvement from on-going review exercise by the environmental performance monitoring committee.

9.3 REGULATORY REQUIREMENTS

The EIA approval conditions and the proposed P2M2 as specified in this EIA report shall form the basis for design and implementation of the pollution prevention and mitigation measures and environmental monitoring program of the Project.

The P2M2 proposed in the **Chapter 8** of this EIA are generally developed in accordance with the relevant environmental requirements as per regulatory requirements include Malaysian standards and criteria for the major environmental aspects such as air quality, noise, and etc. A list of the Acts, Regulations, Policies and Codes is given in **Table 9.1** for reference during the monitoring and surveillance of the Project.

Table 9.1: List of Legislative, Regulatory and Other Policy Requirements

Key Performance Indicators	Acts and Regulations	Application (Operational Phase)
Water Quality	• Maintain baseline water quality	√
	• National Water Quality Standards for Malaysia (NWQS), Class IIB	√
	• Standard B of Environmental Quality (Sewage) Regulations 2009, Fifth Schedule	√
	• Environmental Quality (Industrial Effluents) Regulation, 2009	√
Ambient Air Quality	• New Malaysia Ambient Air Quality Standards (MAAQS), 2020	√
	• Environmental Quality (Clean Air) Regulations, 2014	√
	• Environmental Quality (Control of Emission from Petrol Engines) Regulations 1996	√
	• Environmental Quality (Control of Emission from Diesel Engines) Regulations 1996	√
	• Environmental Quality (Declared Activities) (Open Burning) Order, 2003	√
Ambient Noise Level	• Planning Guidelines for Environmental Noise Limits and Control, DOE, 2021 (Reprint)	√
	• Environmental Quality (Motor Vehicle Noise) Regulations, 1987	√
	• Factories and Machinery (Noise Exposure) Regulations 1989 – First Schedule (Permissible Exposure Limits)	√
Safety and Health	• Occupational Safety and Health Act, 1994 (Act 514)	√
	• OSHA Standard for Noise Exposure	√
Waste Management	• Environmental Quality (Scheduled Wastes) Regulations, 2005 (Amendments 2007)	√

	Local Government Act, 1976, Section 69 – 71	√
	Guidelines on the Handling, Storage, Transportation and Disposal of Solid Waste, 1998	√
Public Health and Safety	Occupational Safety and Health Act, 1994 (Act 514), Department of Occupational Safety and Health (DOSH), 2006	√
	Guidelines on Trenching for Construction Safety, DOSH, 2000	x
	Guidelines for Public Safety and Health at Construction Site, 2007	x

9.4 ROLE AND RESPONSIBILITIES

The implementation of the EMP involves various parties in the Project teams. **Figure 9.2** demonstrates the conceptual environmental management organization structure of the proposed Project while the brief description of roles and responsibilities of each party are summarized in **Table 9.2**

Table 9.2: Roles and Responsibilities of the Various Parties Involved in the EMP Implementation

Party	Roles and Responsibilities in Environmental Matter
Department of Environment Perak, Enforcement Unit (Regulatory Body)	- Ensure that the PP and the MC and his SCs adhere to all environmental standards, regulations and acts. - Review monitoring and audit reports submitted by the PP and the Environmental Auditor. - Inspection of the Project at the site to ensure compliance with the EIA approval conditions. - Issue non-conformity notification in case of violations.
Project Proponent (PP)	- To establish the company environmental protection policy specific to the proposed Project. - To imposes EIA approval conditions and environmental regulatory requirements to all parties involved in the construction and operation phases.

	• To obtain all relevant permissions and approvals in relation with the EIA approval conditions and Malaysian environmental legislations requirements. • To provide environmental management budget and necessary facilities such as minilab, etc. • To review the overall environmental performance on-site. • To review and ensure update of EMP from time to time.
Site Engineer (SE)	• To conduct regular meetings (e.g., safety toolbox meetings) with the MC with the assistance of the EO to discuss the day-day environmental issues related to the Project to ensure that the Project complies with the EIA approval conditions and all other available requirements and guidelines. • Ensure all the activities undertaken by the MC and SCs comply with other written instructions given by the DOE, Local Authority, and etc.
Main Contractor (MC)	• To establish competence environmental management unit for the implementation of EMP. • To oversee the implementation of the P2M2 as proposed in the EMP on-site and take necessary actions to enhance the environmental quality on-site. • To ensure provision of appropriate qualified person and competent person to facilitate the implementation of the EMP. • To ensure the EIA approval conditions and relevant environmental legislation or requirements are communicated to and implemented by all staffs and sub-contractors. • To ensure that all workers go through induction training on the environmental and safety and health aspects coordinated by SHEO together with the EO.
Sub-Contractor	• To ensure environmental requirements are implemented by all workers by translating the environmental requirements into the work procedures. • To communicate non-conformance to the supervisor/worker for corrective actions. • To ensure all their workers attend induction training on environmental aspects and awareness courses coordinated by the EO/SHEO.

Project Environmental Consultant	• To develop EMP for the implementation and carry out periodical environmental monitoring and audit program. • To assess the effectiveness of the proposed P2M2 implementation on-site. • To carry out periodical environmental monitoring program [Compliance Monitoring (CM) and Impact Monitoring (IM)] for the Project. • To be part of the EPMC for the Project to support the project team on the issues arise during the EMP implementation and propose sensible P2M2 for PP consideration and action.
Environmental Officer (EO)	• To oversee and hold responsibility for matters pertaining to EMP implementation on-site. • To support the periodical environmental monitoring by Environmental Consultant and audit program. • To carry out on going inspection and maintenance at the identified point sources for potential emission / discharge / environmental concerning areas. • To carry out respective performance monitoring (PM) and maintain the associated Environmental Performance Monitoring Document (EPMD) accordingly. • To monitor sub-contractors' environmental performances. • To review and propose rectification action on any non-conformance activities recorded/ observed onsite.
Safety, Health and Environmental Officer (SHEO)	• Ensure that all construction workers are aware of and comply with the safety and health regulations and standards. • Conduct regular meeting and training with the EO for the construction workers to ensure they are able to implement the proposed P2M2 to abate any environmental disruptions and increase their awareness on safety and health both onsite and offsite.
Competent Person (CP)	• Ensure that all environmental management systems and pollution control equipment are properly adhered to and function efficiently. • Conduct regular inspection on site and for pollution control equipment.

Environmental Auditor	• To carry out environmental audits as per schedule approved by the DOE Perak in accordance with the Environmental Audit Guidance Manual. • Notify visits dated to DOE Perak and the PP. • Plan the audit, identify scope, prepare the checklist, audit dates & timetable. • Ensure that the criteria and standard for environmental performance are adhered to. • To prepare environmental audit report for the PP and the DOE Perak. • Issue non-conformance reports (NCRs) if required for mitigation measures to be taken to readdress any environmental problems in the Project site.
Supervisor & Workers	• To implement actions as stipulated in the EMP and corrective measures proposed by the consultant, EO and SHEO.

EMP is a living document that needs to be updated from time to time, therefore, all parties involved in any phases of the proposed Project shall forms an Environmental Performance Monitoring Committee (EPMC) and make sure that adjustments will be made to accommodate EMP changes when required.

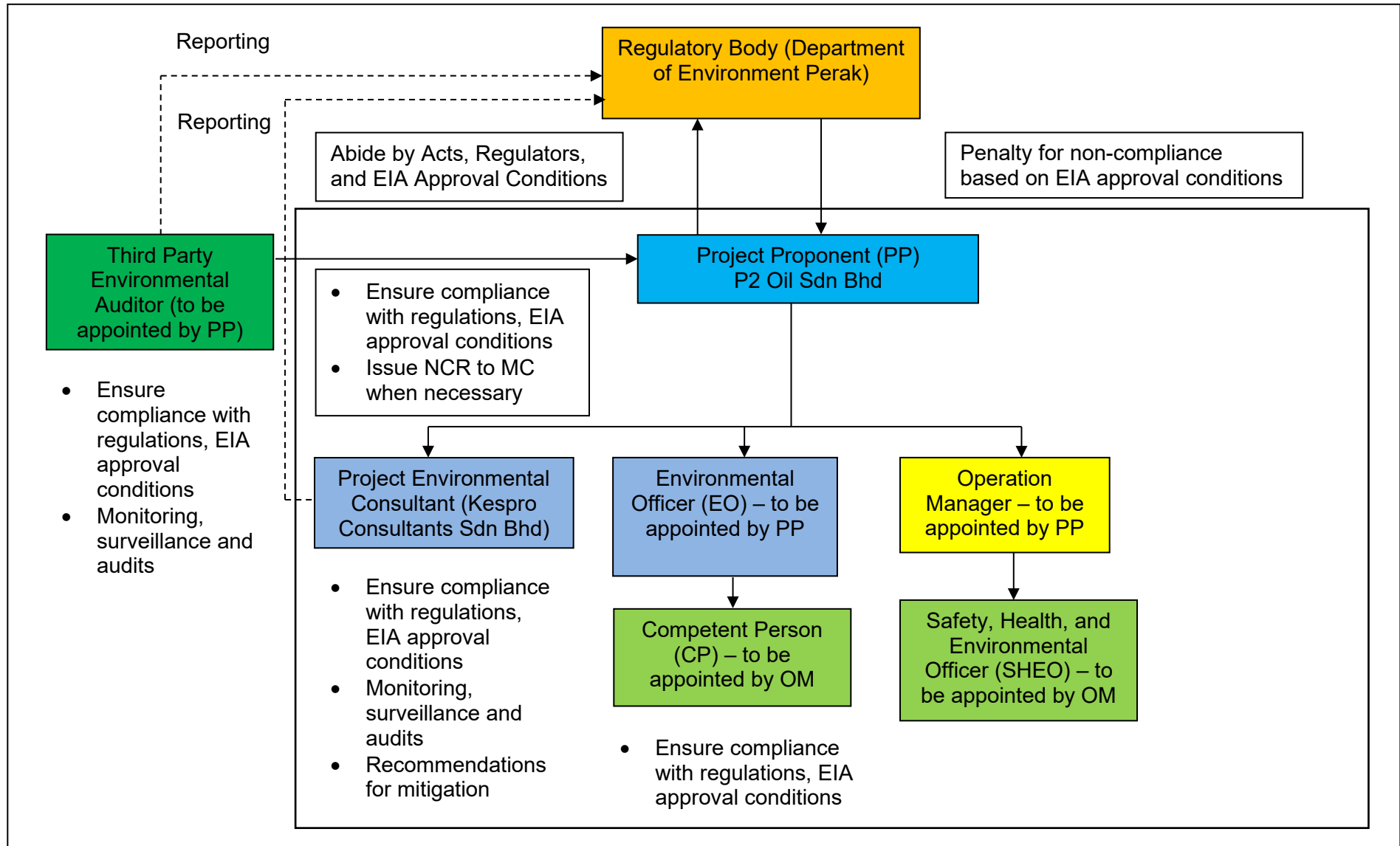


Figure 9.2: Conceptual Environmental Management Organization Structure of the Proposed Project

9.5 TRAINING AND BUDGET

The implementation of the EMP should be supported by an adequate budget and a qualified team to ensure the effectiveness of the implementation. Adequate environment training for the worker is also important to ensure environmental P2M2 is appropriately implemented in the work procedures, and this will minimize potential mishap hence minimize potential pollution at source.

The scope of training will depend on specific job functions and review of the training program based on site specific requirements as well as any changes to the legislations and internal procedures. Expected environmental training required to support the implementation of an EMP are:

- GSR or Environmental Management System (EMS) for the Project, if any;
- P2M2 and action plan proposed for control of pollution for air, noise, water and waste management for the Project;
- Relevant regulatory requirements and internal requirements;
- Training for competency for EO with CESSWI/CISEC certified for implementation of LDP2M2;
- Contingency and emergency response procedures; and
- Performance Monitoring (PM) and Environmental Performance Monitoring Documentation (EPMD) requirements, etc.

In term of the budget for implementing the EMP, principal areas of the budget including, but are not confined to:

- Pollution Control, Best Available Techniques (BAT) operation and maintenance;
- Performance Monitoring (PM) Program;
- Waste management;
- Maintenance of the construction equipment;
- Environmental awareness training;
- Environmental monitoring (CM and IM) and audit program; and
- Emergency response training and equipment maintenance.

9.6 ENVIRONMENTAL COMMITMENTS

To formulating sectoral P2M2 that are implementable and practical to be carried out on-site is an essential part in the EMP. These plans shall be communicated to all parties involved in the implementation of the EMP and in order to ensure the environmental management requirements are implemented in a holistic and systematic manner on-site. Apart from the BAT, the best practices should be integrated into the standard work procedures either during the construction and operation phases of the proposed Project.

The sectoral pollution control /management plans formulated for the proposed Project are presented in **Table 9.3**.

Table 9.3: Sectoral Pollution Control or Management Plans for the Proposed Project

Control/Management Plan	Management Elements (Operation Phase)
Erosion and Sediment Control Plan	Not relevant.
Water Quality Control Plan	No wastewater to be discharged from the premises.
Air Pollution Control Plan	• Pyrolysis to be carried within the building with proper air pollution control systems (APCS). • All sources emitting dust and air pollutants from the manufacturing activities and operations should be equipped with effective pollution control systems.
Noise Control Plan	• Machines used to be serviced and maintained. • Crushing machinery will be housed in an appropriate enclosed structure. • Provision of extensive trees and shrubbery as a natural means of diffusing noise. • Carry out regular audiometric test on the workers.
Waste Management Plan	• Domestic wastes: - Proper disposal at approved dump site. - Collection and disposal of wastes should be on a regular basis. - Cleanliness of waste area to be maintained all the time. - Open burning of garbage is strictly prohibited.

	• Scheduled wastes: - Scheduled wastes to be disposed of by a DOE licensed contractor. - Handling and management of scheduled wastes shall be in accordance with the Environmental Quality (Scheduled Wastes) Regulations, 2005 (Amendment 2007).
Traffic Management Plan	• Clear traffic signages must be set up where necessary within the Project site. • All vehicles to and from of the Project site must strictly comply with the statutory speed limit.
Health and Safety Plan	• Provision of training and proper PPE for workers. • Conduct regular safety awareness program for workers. • Provision of health and medically screening for the workers.

9.7 ENVIRONMENTAL MANAGEMENT, MONITORING AND AUDITING REQUIREMENT

In order to verify the effectiveness of the P2M2, periodic environmental performance evaluation should be carried out. The evaluation will consist of environmental monitoring program and audit inspection program as described below:

9.7.1 Environmental Monitoring

The objective of proposing environmental monitoring programs is to alert management to the occurrence of pollution or undesirable impacts on the environment. With early detection, appropriate remedial actions can be expeditiously carried out to avoid irreversible damage to the environment. Therefore, the PP should undertake the various programs in meeting the objective mentioned above.

The environmental monitoring programs comprise of three types of monitoring namely Performance Monitoring (PM), Compliance Monitoring (CM) and Impact Monitoring (IM).

Performance Monitoring Program

The proposed Project site is installed with the air pollution control system (APCS) and industrial effluent control system (IETS) during the recovery process of scheduled wastes. The performance monitoring shall be conducted to ensure the P2M2 facilities are performing effectively.

The PP shall appoint dedicated and trained personnel to monitor the performance of the APCS, IETS, as well as metal wastes management within the facility.

They are responsible for the following tasks:

- Conduct and submit timely reports to DOE and Performance Monitoring Committee (PMC) according to schedule. The contents of the reports are listed below.
 - (i) Performance monitoring of the APCS and IETS;
 - (ii) Preventive inspection; and
 - (iii) The changes to the major P2M2 (if any).
- Maintain records of activities as mentioned above for a minimum period of three years;
- Activate and supervise the running of PMC; and
- Maintaining good working ethics.

The appointed trained person (competent person) should conduct the preventive maintenance of APCS in different periods of time such as weekly, monthly semi-annually. The procedures for the preventive maintenance of APCS are shown in table below.

Preventive Maintenance of APCS (Wet Scrubber)

The appointed competent person should conduct the preventive maintenance of APCS in different periods of time such as daily, weekly, monthly, quarterly and annually. The procedures for the preventive maintenance of APCS for wet scrubber are shown in table below and are obtained from the Guidebook on Performance Monitoring of Scrubber and an example of checklist form is shown in **Appendix 9.1**.

Table 9.4: Preventive Maintenance Wet Scrubber

Frequency	Procedure
Daily	• Check recycle flow. • Check scrubbing liquid pH value. • Check discharge wastewater flow rate. • Check discharge wastewater pH value. • Check scrubber overall pressure drop. • Check pressure drop across mist eliminator. • Check pressure drop across packing. • Check inlet and outlet temperature of gas stream. • Check air flow rate. • Check visually stack emission condition.
Weekly	• Check recirculation pump discharge pressure. • Check fan motor operating current. • Check circulation pump motor operating current.
Monthly	• Check fan vibration. • Check pump vibration. • Check pump/piping leakages. • Check fan motor temperature. • Check spray nozzles plugging or leaks. • Check pump motor temperature.
Semi-annually	• Inspect fan on material build up.
Half Yearly	• Inspect fan drive mechanism, i.e., bearings, belt tension, grease level, etc. • Inspect mist eliminator for any solid build up. • Inspect packing for any fouling. • Pump servicing – replace bearing, grease & mechanical seal (for end suction centrifugal pump).
Annually	• Verify accuracy of monitoring instruments and calibrate. • Inspect physical conditions of scrubber, i.e., housing, ductwork, etc. • Overall system cleaning.

Performance Monitoring of APCS (Wet Scrubber)

The parameters that must be monitored at the minimum and kept in log book are as below. Information is obtained from Guidebook on Performance Monitoring of Scrubber.

Table 9.5: Performance Monitoring of Wet Scrubber

No.	Parameters	Location	Method of Monitoring
1	Pressure Drop	- Scrubber Body - Packing - Mist Eliminator	Differential Pressure Meter
2	Temperature	- Inlet - Outlet	Thermometer
3	Liquid Flow Rate	- Feed - Make-up	Flowmeter
4	pH	- Feed - Recycle	pH Meter
5	Stack Emission Condition	- Chimney	Visual
6	Air Flow Rate	- Overall	Flowmeter

Compliance Monitoring Program

Compliance monitoring (CM) is the monitoring of the performance of the implemented P2M2 within the facility, which shall be carried periodically to ensure the proposed P2M2 to be implement and EIA conditions of approval (COAs) are complied all the times during the operation. It could assess the overall project compliance and provide opportunity for optimization and further improvement in environmental management of the Project. The compliance monitoring for the APCS is provided in the table below.

Table 9.6: APCS Compliance Limit

No.	Stack ID.	APCS No.	Parameters/Limit	Monitoring Type	Reference CAR 2014
1	C1	APCS 1	Total Particulate Matter (20mg/m ³); SO ₂ (500mg/m ³); NO ₂ (400mg/m ³)	Continuous* Continuous* Periodic	Third Schedule, Item D

*Average time for continuous monitoring is 30 minutes

Impact Monitoring Program

An environmental impact monitoring (IM) program to identify the predicted and unanticipated changes to the environment brought about by the proposed Project will be carried out as stated below.

To enable a comparison of environmental impacts over time (that is, a comparison between the baseline that is to be established in the initial EIA and coming monitoring results), the relevant IM parameter and the recommended limits, and the monitoring locations and frequencies are discussed below.

A quarterly Environmental Quality Monitoring Report is recommended for submission to DOE based upon monitoring data collected monthly, quarterly or annually. The locations and frequencies of monitoring are shown in the table below.

Water Quality

Monitoring location: As shown in **Table 9.7**.

Table 9.7: Impact Monitoring Location for Water Quality

Location	Description	Coordinate	
		Latitude	Longitude
W1	Upstream (External Drain Before Project Site)	4°30'45.0"N	101°8'57.2"E
W2	Downstream (External Drain After Project Site)	4°30'44.3"N	101°8'54.3" E
W3	Downstream (Stormwater Drainage)	4°30'42.5"N	101°8'42.5"E
W4	Downstream (Stormwater Drainage)	4°31'01.0"N	101°8'17.4"E
W5	Downstream (Sungai Raya)	4°31'00.5"N	101°8'16.5"E

Reporting frequency: Quarterly

Parameters: As shown in **Table 9.8**.

Table 9.8: Impact Monitoring Parameters for Water Quality

Parameter	Method Ref. No.: *APHA	NWQS (Class IIA/ IIB)
pH	4500 H+B	6.0 – 9.0
Temperature, °C	2550 B	-
BOD ₅ at 20 °C, mg/l	5210 B	3
COD, mg/l	5220 C	25
TSS, mg/l	2540 D	50
Ammoniacal Nitrogen, mg/l	4500 NHB3-F	0.3
DO	4500 O-G	5 – 7
Oil and Grease, mg/l	5520 B	-
E. coli, CFU/100 mL	9222 G	-
Cd (mg/L)	3120 B	0.01
Cr (IV) (mg/L)	3120 B	0.05
Cr (III) (mg/L)	3120 B	-
Cu (mg/L)	3120 B	0.02
Fe (mg/L)	3120 B	1
Pb (mg/L)	3120 B	0.05
Mn (mg/L)	3120 B	0.1
Ni (mg/L)	3120 B	0.05
Sn (mg/L)	3114 C	-
Zn (mg/L)	3120 B	5
Hg (mg/L)	3112 B	0.001
As (mg/L)	3114 C	0.05

The future water quality monitoring stations are same as baseline water quality monitoring stations.

Air Quality

Monitoring location: As shown Table 9.9.

Table 9.9: Impact Monitoring Locations for Air Quality

Location	Description	Coordinate	
		Latitude	Longitude
A1	Project Boundary	4°30'44.4"N	101°08'54.6"E
A2	Nearest Shophouse at Taman Seri Raia	4°30'38.6"N	101°08'24.7"E
A3	Nearest House at Kg. Tekkah	4°30'05.6"N	101°08'48.6"E
A4	Entrance at Auasia Nutriculture (Agro-based Industry)	4°30'53.3"N	101°09'04.0"E

Reporting frequency: Quarterly for the ambient air monitoring and quarterly for the stack emission monitoring.

Ambient Air Quality

Parameters: Particulate Matter (PM₁₀ & PM_{2.5}), Sulphur Dioxide (SO₂), Nitrogen Dioxide (NO₂), Ozone (O₃), Carbon Monoxide (CO), and (HCl).

The future monitoring stations for ambient air monitoring are same as baseline air quality monitoring stations.

Stack Emission Monitoring

Stack emission monitoring shall be conducted at the chimney of the air pollution control system (APCS1) for Stack AP1 for the following parameters to determine and to monitor the air pollutants level for stacks leading from scrubber system for compliance with Environmental Quality (Clean Air) Regulations 2014 for the following parameters:

- 1) Total PM
- 2) Oxides of Nitrogen, NO_x

- 3) Hydrogen Sulphide, H₂S
- 4) Chlorine Gas, Cl₂
- 5) Hydrofluoric Acid, HF
- 6) Hydrogen Chloride, HCl
- 7) Sulfuric Acid, H₂SO₄
- 8) Copper, Cu
- 9) Zinc, Zn
- 10) Arsenic, As
- 11) Antimony, Sb
- 12) Lead, Pb
- 13) Cadmium, Cd
- 14) Mercury, Hg
- 15) VOC
- 16) Opacity

Noise

Monitoring location: As shown in **Table 9.10**.

Table 9.10: Impact Monitoring Location for Noise

Location	Description	Coordinate	
		Latitude	Longitude
N1	Project Boundary	4°30'44.4"N	101°08'54.6"E
N2	Nearest Shophouse at Taman Seri Raia	4°30'38.6"N	101°08'24.7"E
N3	Nearest House at Kg Tekkah	4°30'05.6"N	101°08'48.6"E
N4	Entrance at Auasia Nutriculture (Agro Based Industry)	4°30'53.3"N	101°09'04.0"E

Reporting frequency: Quarterly

Parameters: L_{Aeq}, L₁₀, L₅₀, L₉₀

The future monitoring stations for noise level measurements are same as baseline noise level monitoring stations.

9.7.2 Environmental Auditing

Environmental audit shall be carried out annually in order to ensure the EIA conditions of approval (COAs) are complied all the times during the Project implementation. An environmental audit is a systematic, documented verification process of objectively obtaining and evaluating evidences to determine whether specified environmental activities, events, conditions, management systems, or information about these matters, conform to audit criteria.

Environmental audit is also the objective measure of environmental management performance against standards set down by legal regulation, established criteria and company policy, with the findings communicated to the company. Environmental audit will be introduced as a management tool to provide feedback and control to management. It is recommended that environmental audit be carried out annually by DOE registered auditor.

Typically, there are three types of environmental auditing program namely internal audit, second party audit and third party audit. Internal audit is conducted by the in-house environmental management unit while the second party audit is conducted by the any environmental auditor appointed to audit the Project. In term of third party audits, it should be conducted by an independent auditor who is not directly involved in the environmental management of the Project. Environmental compliance audit for the proposed Project shall be carried out by the third party auditor being the qualified person (QP) in according to the requirements stipulated section 33A of EQA 1974 or as stipulated in the approval conditions.

All audit findings should be recorded and submitted to DOE and to be reviewed by the PP and the Project management team. All corrective manners, if applicable should be specifically planned and developed, aiming to achieve environmental, health and safety continuous improvement.

For this purpose, an independent environmental consultant firm with strong knowledge in the environmental aspect should be appointed by the Project Proponent to conduct the audit for the proposed Project. The audit program should look into various requirements by DOE which include the following:

- (a) Auditing the P2M2 incorporated for the proposed Project with recommendations in the EIA report;
- (b) Auditing against the approval conditions for the EIA report; and

- (c) Auditing with respect to conditions specified in the licensing conditions imposed for the proposed Project.

Some of the pertinent requirements of the above should include the following:

- (i) Compliance to all monitoring requirements as imposed by DOE;
- (ii) Compliance to all standards, criteria and guidelines as imposed by DOE and other authorities;
- (iii) Compliance to all proposed plans submitted to relevant Government Departments;
- (iv) Compliance to mitigation measures proposed in the EIA report; and
- (v) Compliance with any other conditions imposed by DOE and other agencies in relation to the operation of the proposed Project either by way of licensing or others.

9.7.3 Environmental Reporting

Environmental reporting, which documents environmental status/progress and any issues arising from the development of the proposed Project, is a vital component of compliance to the DOE requirements. Basically, the reporting requirements at this stage of EMP formulation represent the sequence of documentation that comes with each management program throughout the different phases of the proposed Project.

9.8 GUIDED SELF-REGULATION (GSR)

9.8.1 Environmental Mainstreaming Tool (EMT)

Environmental mainstreaming tool (EMT) is a tool for accomplishing the goal of cultivating the self-regulation culture in the regulated sectors. EMT refers to the integration of environmental concern, aspects, and considerations in all business processes, at all stages of decision making, at all levels of organizational hierarchy, and at all phases of the operation of a company owner is shouldered with greater environmental responsibility and accountability for ensuring environmentally friendly options are chosen in the course of operation of his manufacturing facility and in conducting his business.

The Project shall include following mainstreaming elements:

Environmental Policy (EP)

P2 Oil Sdn Bhd (POSB) is committed to ensure its activities involved in the Project are conducted at minimal impacts and risks to the surrounding environment. Environmental protection is one of the important aspects being considered at all stages of the Project implementation and at all organizational levels. POSB considers the environment at basic or fundamental component of quality for its products and services and is committed to the concept of sustainable development aimed at a balance between the need of protecting the environment and the need for economic development.

POSB recognizes and respects the environmental sensitivity of development to the surrounding environment. With full commitment from POSB and the advice of Kespro Consultants Sdn Bhd (EC), it is anticipated that this Project will cause minimal environmental impacts to nearby interests and its natural surroundings.

Environmental Budgeting (EB)

A sufficient budget shall be allocated for the implementation of the EMT initiative. The Project management is committed to provide financial allocation for the purpose of implementing the Project. The summary of the budget that has been allocated for the environmental protection works as mentioned is presented in **Table 9.11**.

Table 9.11: Environmental Budgeting

No	Details	Rate (RM Per Unit)	Amount (RM) per year
1	Environmental Quality Monitoring (PM, CM & IM programme)	8,000 / Quarter	32,000
2	Training	5,000 / year	5,000
3	Environmental Protection Pertaining Air Quality Setting up, operation and maintenance expenses	13,000 / Quarter	52,000
4	Environmental Protection Pertaining Water Quality Setting up, operation and maintenance expenses	8,000 / Quarter	32,000
5	Environmental Protection Pertaining Noise Level Setting up, operation and maintenance expenses	1,000 / Quarter	4,000
6	Waste Management Handling, transportation, storage area and disposal of schedule waste and non- schedule waste	3,000 / Quarter	12,000
7	EMP	Lump Sump	20,000
8	Environmental Auditing	10,000 / year	10,000
9	Emergency response training and equipment maintenance	Lump Sump	3,000
10	Insurance	3,000 / year	3,000
Total			173,000

Environmental Monitoring Committee (EMC)

Environmental Performance Monitoring Committee (EPMC) and Environmental Regulatory Compliance Monitoring Committee (ERCMC) shall be established for the Project.

EPMC is permanent committee at the operational level, to monitor the operation, maintenance and performance of the pollution control systems, waste reduction targets, effectiveness of P2M2, etc. The tentative EPMC structure for the Project is given in **Figure 9.3**. The EMP meetings must be held once per month to discuss and highlight the issues pertaining to environment, and the minutes of meeting properly documented and maintained.

Meanwhile, the role of the ERCMC is a permanent committee at the policy level which is set up to monitor the implementation and effectiveness of the environmental policy and to formulate additional policy element if necessary. The company's compliance with all the regulations enforced by the DOE comes under the scrutiny and responsibility of this committee. **Figure 9.4** illustrates the tentative ERCMC for the Project. The ERCMC meetings must be held at a minimum once in a quarter and the record of meeting shall be maintained.

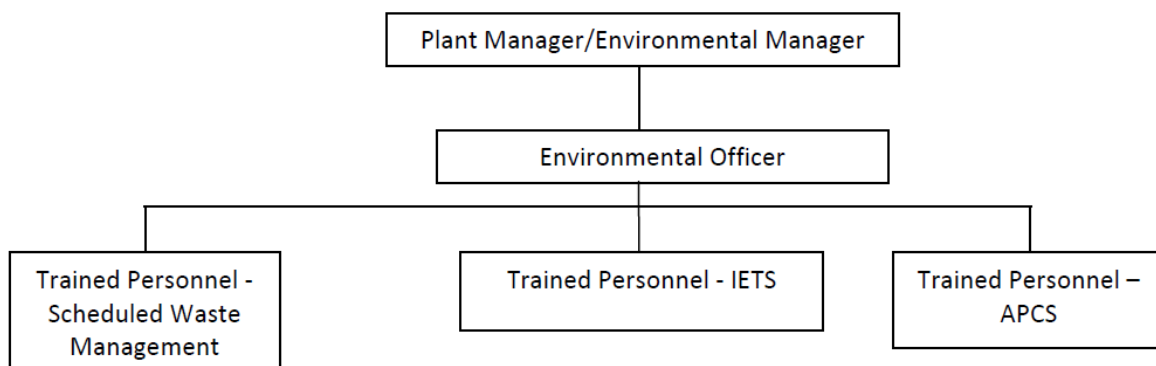


Figure 9.3: Proposed Tentative EPMC for the Project

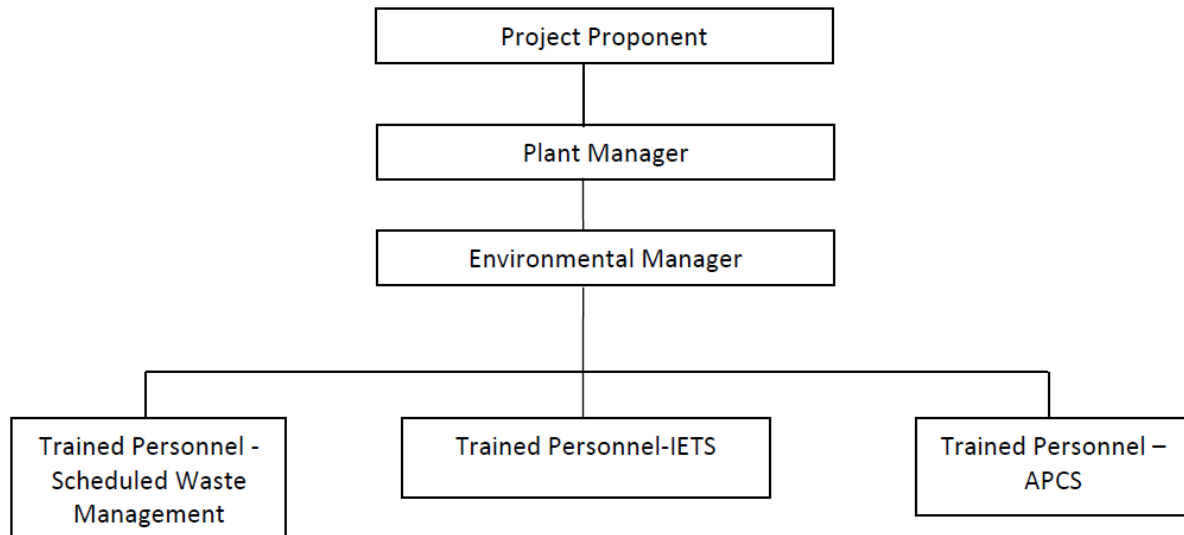


Figure 9.4: Proposed Tentative ERCMC for the Project

Environmental Facilities (EFs)

The main components of the environmental facilities (EFs) include BMPs, and associated support facilities such as laboratory/ mini lab, performance monitoring facilities, on-line instrumentation system as well as waste management infrastructure.

A mini laboratory should be set up to support the operation and maintenance of the pollution control system, especially for IETS, APCS, etc. The list of the EFs that have been allocated for the Project is shown in **Table 9.12**.

Table 9.12: List of the Environmental Facilities

No.	Details
1	Air Pollution Control System (APCS)
2	Solid Waste Skip

Environmental Competency (EC)

Environmental Competence (EC) is the ability to undertake responsibilities and to carry out environmental program to a recognized standard on a regular basis. The organization must draw up a comprehensive training program to produce competent persons and trained support staffs within the facility in order to ensure full compliance with the DOE requirements in the regulated activities. The competent person to be used will be appointed by the PP.

Environmental Reporting and Communication (ERC)

The PP shall establish a reporting procedure and an internal communication channel within the company to report and communicate the environmental performance to the relevant company personnel. Record keeping system should also be set up to maintained all the records related to the operation, maintenance and performance of the pollution control systems, upset conditions and the chemical usage within the facility. In addition, all the data also shall be analyzed and presented during the PMC meetings and for decision making purpose.

Environmental Transparency (ET)

Environmental Transparency (ET) is intended to foster rapport with the immediate neighbors, promote green image, and to improve public confidence. And the companies are encouraged to be more transparent in their environmental compliance and achievement.

Implementation Schedule and Monitoring and Reporting to DOE

The EMT concept must be understood by the top management of the company and the understanding trickle down to those involved in the implementation phase of the mainstreaming initiative. It is recommended that the EMT initiative should be completed within six (6) to twelve (12) months except if it involves real time monitoring mainstreaming elements.

An implementation report shall be submitted to the DOE within six (6) months from the commencement of the implementation of the EMT initiative. The reporting of EMT results can be done via DOE EMAINS online platform: <https://emains.doe.gov.my/>.

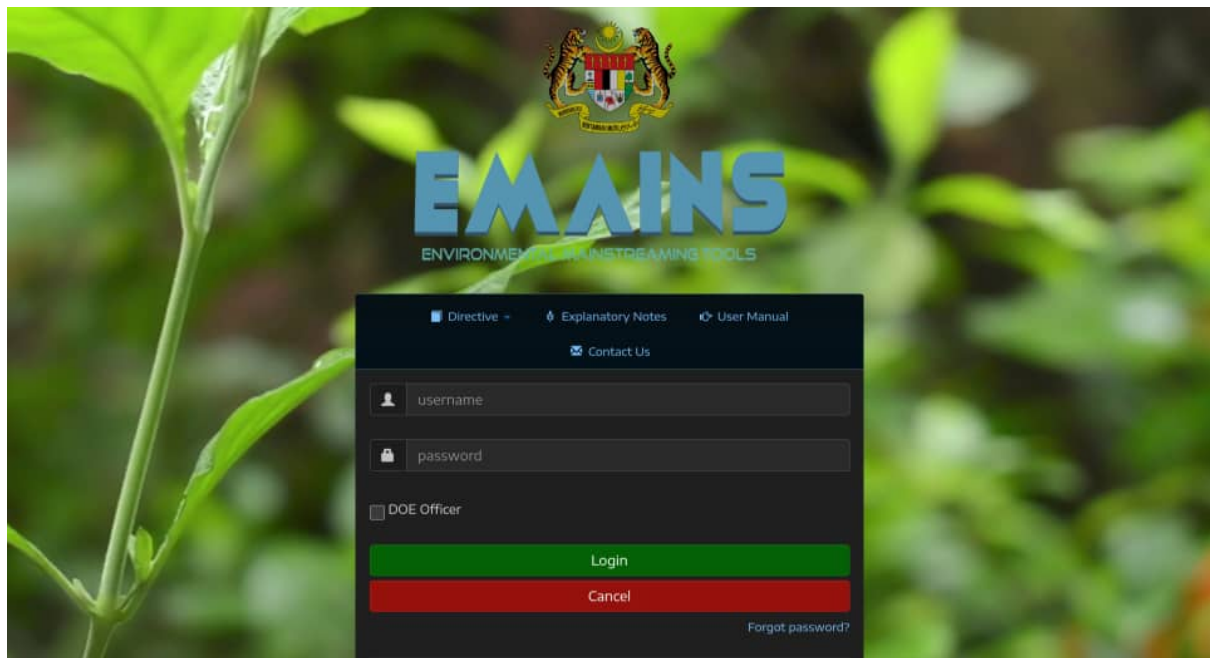


Figure 9.5: DOE EMAINS Main Online Portal

9.9 EMERGENCY RESPONSE PLAN (ERP)

ERP is a controlled document prepared for addressing the environmental, health and safety emergencies during the renovation and operation phases of the proposed Project. It contains policies and procedures to be followed before, during and after an emergency on-site.

9.9.1 Aim and Scope of ERP

The aim of the ERP is to provide procedures and action plans to promote an effective response when faced with an emergency situation, which includes search, rescue and recovery operations and other relief work.

The major objectives of this ERP are:

- a. To minimize confusion and disruption of Project activities;
- b. To protect the lives and well-being of the people working or visiting the Project site;
- c. To minimize damage to equipment, property and facilities;
- d. To minimize economic loss and disruption to Project activities by expediting the safe resumption of operations; and
- e. To effectively coordinate all actions with external agencies providing regulatory and emergency assistance in the event of a crisis or emergency.

Many of the emergency procedures are related to safety. The ERP is implemented in conjunction with other plans and policies.

The scope of the ERP covers the following:

Table 9.13: Scope of ERP

Component	Description
Types of emergencies	Potential hazards and threats to human lives, the Project and its surrounding areas.
Safety procedures	For all work activities when accidents occur.
Emergency organization and responsibilities	Formation of a well-trained and well-equipped response team for fast and effective rescue operations when required.

Details of emergency services	Instructions for notification to the proper authorities (including contact numbers, etc.). The premises will be equipped with fire extinguishers and fire-fighting water hose-reel.
A list of key personnel	Individuals responsible to organize and control operations in emergency situations.
Internal and external communication	A communication plan to ensure that all the site personnel are aware of their duties in an emergency.

The ERP is based on the requirements or general intent of all relevant legal documents and more. These include:

- Occupational Safety and Health Act (OSHA) 1994
- Environmental Quality Act, 1974
- MS 761: 1982, Code of Practice for Storage and Handling of Flammable, Combustible Liquids (UDA 620.263-Sirim 402/2/8)
- Corporate Safety Policy, Rules and Regulations
- ISO 14004:1996 Clause 4.3.3.4 – Emergency Preparedness and Response Plan

9.9.2 Definition of Terms

a. Serious Accident:

A serious accident is defined as a life-threatening incident causing disabling injury to a worker or workers. When a serious or fatal accident occurs on- site, certain procedures should be followed to ensure orderly and proper actions are taken.

b. Disaster:

Defined as a sudden incident causing extensive damage.

c. Emergency:

Defined as an occurrence or a series of circumstances that call for immediate action.

d. Hazard:

Defined as a condition that, unless controlled, will cause harm to persons and/or property.

9.9.3 Command and Control

All control and rescue operations should be under the direction of the Safety, Health and Environmental Officer (SHEO) in the event of a disaster or emergency. The SHEO is also responsible to extend whatever appropriate assistance and available resources within his/her power to external agency or agencies whenever there is a need to do so (such as when a major disaster occurs or when imminent danger extends into a public area). **Figure 9.6** shows the structure of a command system in the event of emergency.

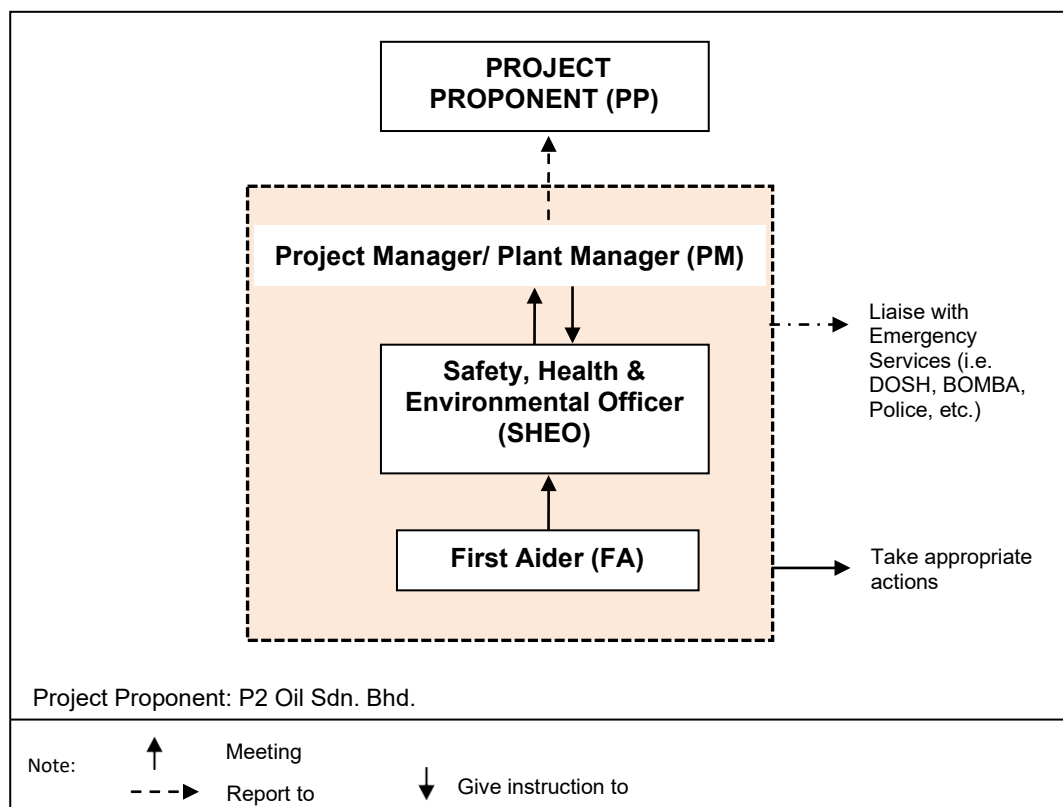


Figure 9.6: Organization Chart of Emergency Control

a. Safety & Health Officer (SHEO) or Safety & Health Officer (SHO)

The PP shall appoint a SHEO in charge of the Project site:

- (i) Provide leadership and guidance to Emergency Response Team (ERT) and appoint an active deputy.
- (ii) Authorize emergency actions, closures and communications.
- (iii) Responsible for overseeing all emergencies and checking the procedures and equipment available for the respective purpose.
- (iv) Responsible for casualties and for organizing medical and welfare support.

- (v) Provide briefing and training to worker regularly.
- (vi) Responsible for all human activities with respect to safety.
- (vii) Constantly update and revise plans for various hazards prevention.
- (viii) Produce post-disaster plans when required.

b. Project Manager / Plant Manager (PM) or Operation Manager (OM)

- (i) Monitor progress of the Project activities.
- (ii) Overall responsibility for appropriate installation and maintenance of preventive measures, such as fire equipment.
- (iii) Coordinate logistic, finance and personnel resources.
- (iv) Communicate with SHEO and other field personnel.
- (v) Coordinate disaster control plan with off-site agencies such as the Fire and Rescue Department (BOMBA), police, hospital and other relevant authorities.

c. All Personnel

An essential action list shall be prepared for all foreseeable emergencies and posted on the Project site notice board for easy reference. All other personnel shall adhere strictly to the instructions of the PM or his delegate during an emergency.

9.9.4 Type of Emergency

Emergencies that could occur off-site and on-site in the Project area are:

1. Injuries and fatal accidents;
2. Fire or explosions;
3. Oil and hazardous materials spillage; and
4. Other types of hazards and emergencies.

9.9.5 Emergency Response Procedures

a. Injuries Fatal Accidents

Injuries and fatal accidents can occur at all phases of Project implementation and therefore the response plans given below are generic in nature responding to all types of general accidents at the Project site.

Stop Work

If any fatal accident or serious injury occurs, the PM should immediately stop all on-going activities in an orderly manner.

- (i) The PM shall perform an immediate systematic safety check of the entire project site under the supervision of the SHEO. Any unsafe areas/ acts shall be remedied immediately;
- (ii) Work shall not resume until the PM has signed off the working area. This should be countersigned by the SHEO who will authorize a resumption of work;
- (iii) In the case of a fatal accident, work shall not resume at the scene of the accident until the police, Department of Occupational, Safety and Health (DOSH) and the BOMBA have made their inspections and given their authority for a resumption of work in the accident area; and
- (iv) The SHEO will liaise with the police, DOSH, BOMBA and the DOE to have joint inspections before resumption of work.

Reporting Procedures

In the event of a fatal accident, the PM and SHEO should immediately inform the police and DOSH who should visit the scene of the accident.

The relevant agencies and authorities and their contact numbers are listed in **Table 9.14**. The PM or the SHEO is required to submit a written report of the accident/ incident to DOSH within 24 hours.

Table 9.14: Contact Numbers of the Relevant Authorities and Agencies for ERP

Agencies/ Authorities	Contact Number
Police Station Gopeng Police Station	05-359 2222
Medical Assistance Batu Gajah Hospital	05-366 3333
BOMBA Gopeng Fire and Rescue Station	05-366 4444
DOSH Jabatan Keselamatan Dan Kesihatan Pekerjaan Perak (JKKP)	05-242 1925

Department of Occupational Safety and Health	03-8886 5343
DOE	
Jabatan Alam Sekitar Negeri Perak	05-253 4749
Jabatan Alam Sekitar Cawangan Gopeng	05-354 1575

b. Fire or Explosion

In case of fire and explosion, the following procedures apply: Before the fire alarm is activated:

- (i) Activate the fire alarm or shout "FIRE, FIRE" if in public places;
- (ii) Report fire location to the nearest personnel who has a walkie- talkie or any medium of communication;
- (iii) Call for medical help if there are persons injured; and
- (iv) Do not re-enter the Project area until it is certified safe.

If the fire alarm is activated:

- (i) Assist the public to use the escape route;
- (ii) Direct the workers to the designated gathering area;
- (iii) Do not stop to collect personal belongings;
- (iv) Switch off all powered equipment; and
- (v) Follow the instructions from the SHEO and his staff.

Extinguish the fire:

- Attempt to use the nearest fire extinguisher to extinguish the fire if the height of the fire does not exceed the knee level. Or alternatively, evacuate; and
- Call the nearest available BOMBA.

Finally, report all accidents to the relevant authorities and the Management by the SHEO.

c. Scheduled Waste Materials Spillage

Scheduled waste materials spillage may occur during Project implementation. If such an event occurs, the following steps should be taken as quickly as possible:

- (i) Stop the source of the spill;
- (ii) Contain the spill if it is a small spill;
- (iii) Scoop up and clean the spill with proper cleaning tool;

(iv) Keep the area well-ventilated if in indoor or enclosed (confined) environment.

If the spill is large, then the Contingency Plan for Major Spill should be activated immediately with the assistance of the relevant authorities such as BOMBA, JPJ, DOE etc.

d. Other Types of Hazards or Emergencies

These will include structure collapse. Should any of these accidents occur, the following procedures to follow are:

- (i) Stop work and sound the alarm;
- (ii) Activate the emergency procedures;
- (iii) Call the police, ambulance or BOMBA;
- (iv) Try to search and rescue the person or persons if possible. If situations are complicated, spectators should wait for the police and the rescue teams to perform the necessary actions;
- (v) Cordon off the area of accident to avoid the situation from getting worse and to provide accessibility to the accident site;
- (vi) Survey and report on the area of other accidents to the relevant authorities; and
- (vii) Work should start only after permission is given.

9.9.6 Summary

The ERP should be supplemented with training, simulated exercise and refresher courses for the involved personnel.

9.10 PROJECT ABANDONMENT AND CLOSURE PLAN

In the event of abandonment, the PP will have to take certain necessary actions depending on the stages of implementation. The Project Abandonment and Closure Plan consists of guidelines for environmental control if the Project is abandoned partially completed or when fully completed during the construction or operational phases.

There are two phases of abandonment addressed in the Project Abandonment and Closure Plan, which are:

- (a) During operational phase.

Actions required for each of the two phases are discussed in the following Sections.

9.10.1 Operation Phase

In the unlikely event that the Project is abandoned during the operational phase, the authorities will determine the conditions of the Project site before the commencement of decommissioning. A Site Assessment Report is required for submission to the DOE and the Local Authority prior to Project decommissioning.

The site assessment includes visual assessment, review of the effectiveness of mitigation measures carried out during the construction and operational phases, operations and incidents records checking plus an overall assessment of any rehabilitation programmes that the PP and Contractor may have to put in place to restore the site for its future different use.

The following measures have to be undertaken prior to closure.

- (a) The PP must inform all relevant authorities on the closure and abandonment of the Project;
- (b) The Project site to be fenced up and warning signs to be installed around the Project site;
- (c) Demolition activities and excavation works shall proceed in a systematic manner in accordance with the regulations stipulated in the Factories and Machinery (Building Operations and Works of Engineering Construction) (Safety) Regulations 1986;
- (d) Inspections around the demolition area to be made by a designated person to ensure demolition activities are carried out in a safe manner;

- (e) Wastes from the Project to be used, stored, transported for disposal must be handled properly to ensure the least possible hazards to the general public;
- (f) Scheduled wastes generated from the Project site need to be managed in accordance with the Environmental Quality (Scheduled Wastes) (Amendment) Regulations 2007;
- (g) All contaminated soil areas to be scrapped off and removed for proper disposal as scheduled wastes and replaced with clean fill;
- (h) All drainage lines to be cleared of garbage;
- (i) All uneven depression areas after demolition to be levelled, filled and turfed to reduce erosion; and
- (j) All landscape works to be carried out to cover exposed soil surface to prevent soil erosion.

CHAPTER 10

STUDY FINDINGS

CHAPTER 10 : STUDY FINDINGS

10.1 OVERVIEW

The consultants have appraised the potential impacts of the proposed Project involving to carrying out the rubber tire wastes and related feedstocks for refined oil manufacturing at pyrolysis facility on part of Lot 225111 (Plot A), Jalan Gopeng, Kawasan Perindustrian Tungzen, Mukim Sungai Raya, 31300 Kampung Kepayang, Perak Darul Ridzuan.

Chapter 1 introduces the proposed Project while **Chapter 2** provides the Scoping Notes for Environmental Impact Assessment (EIA) Study for the proposed Project. The Statement of Need and Project Options for the implementation of the Project are given in **Chapter 3 and Chapter 4** respectively. The description of the recovery processes for the proposed Project was presented in **Chapter 5**, which includes the pollution sources and residual wastes generated from the solid wastes' recovery operations.

Chapter 6 of the Environmental Impact Assessment (EIA) Report provides the baseline environmental quality at the proposed Project site while **Chapter 7** depicts the salient environmental issues brought about by the implementation of the proposed Project and the impact generated by the proposed Project throughout the implementation stage. After evaluating the significances of the impacts generated, pollution prevention and mitigation measures (P2M2) are then recommended and outlined in **Chapter 8** for each activity that may accrue impacts.

Chapter 9 provides the environmental management plans and programs to be conducted throughout the operations of the proposed Project. It is without doubt that the operation of the proposed Project augers well with the Government's call in the recycling, reuse and recovery of the wastes, which will assist in the reutilization of resources that are fast depleting. The proposed Project would provide another avenue for the procurement of semi-finished and/or finished product to be used by other industries in their processes.

The proposed Project also generates job opportunities in various fields, both in skilled and semi-skilled employment. Direct benefits to the industrial sector are evident as wasted resources have added value with the recovery operations in place and this provides a good hierarchy in waste management.

Therefore, the proposed Project benefits those who are directly involved in the operation of the proposed Project [the Project Proponent (PP) and other related merchants]. Indirectly, other sectors of the economy such as the manufacturing and transport industry will also gain indirect benefits from the operations of the proposed Project.

10.2 FINDINGS

In the implementation of the proposed Project, potential adverse impacts on the environment may accrue if mitigation measures are not integrated in the planning, design and implementation of the proposed Project. However, recommendations have been made in this report to address any adverse issues resulting from the operations of the proposed Project.

Various P2M2 or preventive measures including safety response have been outlined in **Chapter 8** of this EIA Report to be used in the proposed Report to mitigate further issues outlined earlier. With the control system in place, together with the stringent management commitment and the use of best management, and engineering practices, adverse impacts can be mitigated to an acceptable level so that the operations of the proposed Project are acceptable to safety and human health.

The proposed Project is an environment friendly and conservation conscious project that contributes to waste minimization, resource and environmental conservation and at the same time expanding beneficial economic activities and creating employment. In addition, it encourages the process of recovery of solid wastes. Like any other industrial projects, some negative impacts are envisaged. However, with proper and efficient mitigation measures, the negative impacts can be kept to a minimum.

Mitigation measures including scheduled waste management, incoming waste screening and acceptance criteria, and other measures have been proposed, and adequate for impacts abatement, and shall reduce the negative impacts to the environment, in particular sensitive receptors at the nearest human settlement areas, and the distance between the factory and the sensitive receptors have sufficient buffer to ensure no and negligible impacts to the receptors from factory operation.

Overall, the positive impacts from this Project far outweigh the negative impacts. Therefore, the Project is recommended for implementation subject to all the P2M2 as recommended being adopted.

REFERENCES

REFERENCES

GENERAL REFERENCES

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Environmental Impact Assessment Guideline in Malaysia (DOE, 2016)

Environmental Quality Act, 1974

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Environmental Quality (Industrial Effluent) Regulations, 2009

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

Environmental Quality (Prescribed Conveyance) (Scheduled Wastes) Order, 2005

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Rancangan Fizikal Negara Keempat

Rancangan Struktur Negeri Perak 2040

Rancangan Tempatan Daerah Batu Gajah 2025

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APPENDIX 1.1

LAND TITLE

Kanun Tanah Negara
Borang 5CK
(Jadual Keempat Belas)

PAJAKAN NEGERI**No. Hakmilik : 285518****Cukai Tahunan : RM2,256.00**

Pajakan selama 99 tahun, tempoh berakhir pada 29 September 2094.

Negeri	: Perak
Daerah	: Kinta
Bandar/Pekan/Mukim/Country	: Mukim Sungai Raya
No. Lot	: Lot 225111
Luas Lot	: 4698 Meter Persegi
Kategori Penggunaan Tanah	: Perusahaan
No. Lembaran Piawai	: 667
No. Pelan Diperakui	: 90968
No. Fail	: PTG.PK. 33/8-602(A)

Tanah yang diperihalkan di atas adalah dipegang untuk selama tempoh tahun di atas oleh tuan punya pada masa namanya disebut dalam rekod ketuanpunyaan di bawah, tertakluk kepada peruntukan-peruntukan Kanun Tanah Negara, kepada kategori yang dinyatakan di atas dan kepada syarat-syarat nyata dan sekatan-sekatan kepentingan yang dinyatakan di bawah, sebagai balasan bagi pembayaran cukai tahunan yang sewajarnya.

Dengan perintah Pihak Berkuasa Negeri

Didaftarkan pada 2 Ogos 2007

T.M t.t.....
Pendaftar

Pelan tanah, bagi maksud pengenalan, adalah dikepilkan pada Borang B1.

SYARAT-SYARAT NYATA

Perusahaan Ringan

SEKATAN-SEKATAN KEPENTINGAN

Tanah ini tidak boleh dipindahmilik atau dipajak melainkan dengan kebenaran Menteri Besar Perak. Tanah ini tidak boleh dipecah sempadan mengikut Seksyen 135 Kanun Tanah Negara tanpa kebenaran Menteri Besar Perak.



Hakmilik : 080304PN00285518
Tarikh : 27/06/2008
No. Versi : 3
No. Salinan :
Muka Surat : 1 | 3 |

0436575

Hendaklah dipenuhi apabila hakmilik dikeluarkan bagi sambungan

Tarikh mula-mula pemberimilikan : 30 September 1995
No. hakmilik asal (Tetap atau sementara) : HSD 44382 Mukim Sungai Raya
No. hakmilik yang terdahulu daripada ini :
(jika berlainan daripada di atas)

REKOD KETUANPUNYAAN

APEX ENTITY SDN. BHD., 1/1 bhgn.
No Syarikat : 509628-V Tertubuh di bawah Akta Syarikat 1965,
NO. 7, JALAN INDUSTRI USJ 1/2, TAMAN PERINDUSTRIAN USJ 1, SUBANG JAYA, 47600 SELANGOR

REKOD URUSAN

No Pers 2614/2006 Remisyen
CUKAI TANAH DIREMIT DARIPADA RM 2256 KE RM 1833 BAGI TAHUN 2006 SAHAJA
MENGIKUT KEPUTUSAN MMK BIL. 1498 PADA 24 MEI 2006.
didaftarkan pada 5 September 2006 jam 06:06:13 petang
(No Rujukan Fail : PCT)

No Pers 4203/2007 Remisyen
CUKAI TANAH DIREMIT DARIPADA RM2,256.00 KE RM1,833.00 BAGI TAHUN 2007 MENGIKUT
MMK BIL. 1513 PADA 24 JANUARI 2007.
didaftarkan pada 7 April 2007 jam 12:44:21 petang
(No Rujukan Fail : -)

No Pers 3440/2008 Remisyen
CUKAI TANAH DIREMIT DARIPADA RM2,256.00 KE RM1,833.00 BAGI TAHUN 2008 MENGIKUT
MMK BIL. 1539 PADA 13 FEBRUARI 2008.
didaftarkan pada 23 April 2008 jam 08:02:00 pagi
(No Rujukan Fail : PTG.PK.147/08(A))

No Pers 19340/2008 Gadaian menjamin wang pokok
oleh APEX ENTITY SDN. BHD., No. Sykt : 509628-V
1/1 bhgn.
kepada PUBLIC BANK BERHAD, No Syarikat : 6463-H
NO. 76, JALAN SULTAN IDRIS SHAH, IPOH, 30000 PERAK
didaftarkan pada 7 Mei 2008 jam 10:29:18 pagi
Suratkuasa Wakil : 283/2002

PERKARA LAIN YANG MELIBATKAN HAKMILIK

Hakmilik : 080304PN00285518
Tarikh : 27/06/2008
No. Versi : 3
No. Salinan :
Muka Surat : 2 | 3 |

Borang B1

(Jadual Keempat Belas)

PELAN TANAH

(Hakmilik Tetap)

Saya mengesahkan bahawa pelan yang dikepikan di bawah ini adalah salinan benar pelan tanah yang diperakui.
Butiran hakmilik adalah seperti berikut :

Jenis dan No. Hakmilik	:	PN 285518
Negeri	:	Perak
Daerah	:	Kinta
Bandar/Pekan/Mukim	:	Mukim Sungai Raya
Jenis Hakmilik	:	Pajakan Negeri
No. Lembaran	:	667
No. Pelan Diperakui	:	90968
No. Lot	:	Lot 225111
Luas Lot	:	4698 Meter Persegi



Adalah diakui mengikut seksyen 3 dalam Akta Pelan dan Dokumen Tanah dan Lombong (Salinan Fotograf) 1950 (Semakan 1980) bahawa ini ialah salinan pelan yang betul lagi benar yang telah dibuat pada 17.11.2006 bagi lot 225111 di dalam Mukim Sungai Raya Daerah Kinta seperti ditunjuk di atas pelan 90968.

Skala 1 : 1500

Lembar Piawai 667

Mazlan bin Mohammad
b.p. Pengarah Ukur Dan Pemetaan
Perak

2 AUG 2007

Bertarikh pada hari bulan



Pendaftar

APPENDIX 1.2

TENANCY AGREEMENT



KERAJAAN MALAYSIA

IBU PEJABAT
LEMBAGA HASIL DALAM NEGERI MALAYSIA
MENARA HASIL
PERSIARAN RIMBA PERMAI
CYBER 8, 63000 CYBERJAYA
SELANGOR DARUL EHSAN

**RESIT RASMI SETEM**

ASAL

STAMP OFFICIAL RECEIPT

(Sila lekatkan resit rasmi setem ini ke atas surat cara sebagai bukti penyeteman)
Please attach this stamp official receipt to the instrument as evidence of stamping

Cara Bayaran *Payment Method*

TUNAI

No. Adjudikasi *Adjudication No.*

A005CL23D8DA951

Jenis Surat Cara

TENANCY AGREEMENT

*Type Of Instrument***Tarikh Surat Cara**

15/06/2023

*Date Of Instrument***Balasan** *Consideration*

RM 6,000.00

Maklumat Pihak Pertama / Penjual / Pemberi *First Party / Vendor / Transferor / Assignor*

IPOH SY RECYCLE PLASTIC SDN BHD, (683833-A)

Maklumat Pihak Kedua / Pembeli / Penerima *Second Party / Purchaser / Transferee / Assignee*

P2 OIL SDN BHD, (1518068-M)

Butiran Harta / Suratcara *Property / Instrument Description*

PT. 2662, JALAN GOPENG, TUNGZEN INDUSTRIAL PARK, MUKIM SUNGAI RAYA, 31300 KAMPUNG KEPAYANG, PERAK



Dengan ini disahkan surat cara ini disetem dan diindors seperti maklumat di bawah:

This is to certify this instrument is stamped and indorsed as below:

No. Resit Rasmi Setem <i>Stamp Official Receipt No.</i>	A0057C230810393
Tarikh Penyeteman <i>Date of Stamping</i>	17/07/2023
Duti Setem Dikenakan <i>Amount of Stamp Duty</i>	RM 1,086.00
Penalti <i>Penalty</i>	RM 55.00
Pelarasan <i>Adjustment</i>	RM 0.00
Jumlah Dibayar <i>Total Amount Paid</i>	RM 1,141.00
Indorsemen <i>Indorsement (Aktia Setem 1949)</i>	Seksyen 37, Seksyen 48

LEMBAGA HASIL DALAM NEGERI
MALAYSIA

LEMBAGA HASIL DALAM NEGERI
MALAYSIA

Pemungut Duti Setem

No. Kelulusan Perbendaharaan *Treasury Approval No.* : KK/BSKK/10/600-2/12(60)Tarikh Cetak *Printed Date* : 17/07/2023 10:51:53

Pengesahan ketulenan Resit Rasmi Setem ini boleh dipastikan di stamps.hasil.gov.my atau melalui aplikasi telefon pintar
The authenticity of this Stamp Official Receipt can be verified at stamps.hasil.gov.my or by mobile app

Ini adalah cetakan komputer dan tidak perlu ditandatangani
This is a computer generated printout and no signature is required

--- tamat/end ---



IBU PEJABAT
LEMBAGA HASIL DALAM NEGERI MALAYSIA
MENARA HASIL
PERSIARAN RIMBA PERMAI
CYBER 8, 63000 CYBERJAYA
SELANGOR DARUL EHSAN



RESIT RASMI SETEM

ASAL

STAMP OFFICIAL RECEIPT

(Sila lekatkan resit rasmi setem ini ke atas surat cara sebagai bukti penyeteman)

Please attach this stamp official receipt to the instrument as evidence of stamping

Cara Bayaran *Payment Method* TUNAI
No. Adjudikasi *Adjudication No.* A005CL23D8DA951 (SALINAN 1/1)
Jenis Surat Cara *Type Of Instrument* TENANCY AGREEMENT
Tarikh Surat Cara *Date Of Instrument* 15/06/2023
Balasan *Consideration* RM 6,000.00
Maklumat Pihak Pertama / Penjual / Pemberi *First Party / Vendor / Transferor / Assignor*
 IPOH SY RECYCLE PLASTIC SDN BHD, (683833-A)
Maklumat Pihak Kedua / Pembeli / Penerima *Second Party / Purchaser / Transferee / Assignee*
 P2 OIL SDN BHD, (1518068-M)
Butiran Harta / Suratcara *Property / Instrument Description*
 PT. 2662, JALAN GOPENG, TUNGZEN INDUSTRIAL PARK, MUKIM SUNGAI RAYA, 31300 KAMPUNG KEPAYANG, PERAK

Dengan ini disahkan surat cara ini disetem dan diindors seperti maklumat di bawah:
 This is to certify this instrument is stamped and indorsed as below:

No. Resit Rasmi Setem	Stamp Official Receipt No.	A0057C230810394
Tarikh Penyeteman	Date of Stamping	17/07/2023
Duti Setem Dikenakan	Amount of Stamp Duty	RM 10.00
Penalti	Penalty	RM 0.00
Pelarasan	Adjustment	RM 0.00
Jumlah Dibayar	Total Amount Paid	RM 10.00
Indorsemen	Indorsement (Akta Setem 1949)	Seksyen 12




Pemungut Duti Setem

No. Kelulusan Perbendaharaan *Treasury Approval No.* : KK/BSKK/10/600-2/1/2(60)

Tarikh Cetak *Printed Date* : 17/07/2023 10:51:53

Pengesahan ketulenan Resit Rasmi Setem ini boleh dipastikan di stamps.hasil.gov.my atau melalui aplikasi telefon pintar
 The authenticity of this Stamp Official Receipt can be verified at stamps.hasil.gov.my or by mobile app

Ini adalah cetakan komputer dan tidak perlu ditandatangani
 This is a computer generated printout and no signature is required

TENANCY AGREEMENT

DATE THIS 15th Day of June, 2023

BETWEEN

IPOH SY RECYCLE PLASTIC SDN. BHD.

(“THE LANDLORD”)

AND

P2 OIL SDN. BHD.

(“THE TENANT”)

AN AGREEMENT OF TENANCY made the day and year stated in Section 1 of the schedule hereto between the first party whose name and description are stated in Section 2 of the Schedule hereto (hereinafter called "the landlord") of the one part And the second party whose name hereto (hereinafter called "The Tenant") of the other part.

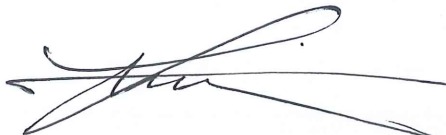
WHEREAS the landlord is letting the premises described in Section 4 of the Schedule hereto (hereinafter referred to as the said premises) in his capacity as described in Section 5 of the schedule hereto.

WHEREBY IT IS AGREED subject to the accompanying General and Special Conditions, the landlord lets and the Tenant takes the said premises for a term stated in Section 6 of the Schedule hereto commencing on/deemed to have commenced on the date stated in Section 7 of the Schedule hereto at the monthly rent stated in Section 8 of the Schedule hereto payable on or before the day stated in Section 9 of the Schedule hereto of every month in advance.

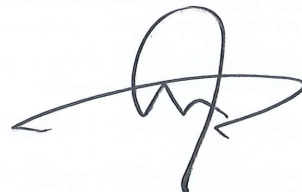
General Conditions

I. The Tenant hereby agrees and covenants with the Landlord as follows:-

- (1) To deposit with the Landlord the sum stated in Section 10 of the Schedule hereto (the receipt of which the Landlord hereby acknowledges) as and by way of deposit or security for the due performance and observance by the Tenant of all and singular the several covenants on the part of the Tenant herein contained. The said sum shall not be deemed to be payment for the rent in advance nor shall it be treated or used by the Tenant as payment for rent due under this Agreement without prior consent of the Landlord and shall be retained by the Landlord until the expiration of the term hereby created by the said sum or any part thereof may be applied in or toward payment of fees charges outstanding or for making good any breach of this Agreement on the part of the Tenant BUT SUBJECT as aforesaid shall be refunded to the Tenant only upon the expiration of the term hereby created.
- (2) To pay the monthly rent at the time and in the manner as set out in Section 9 of the Schedule hereto.
- (3) To apply at his own expense and to pay for the water gas power and light and the telephone and all other public utilities supplied to the said premises and any Government taxes thereon.
- (4) Not to cut maim or injure any of the walls fittings and fittings at the said Premises or to make any structural alternation or additions to the said Premises without the consent in writing of the Landlord and the consent and approval of the relevant authority provided always that if the Tenant shall carry out any renovations alterations or additions to the said Premises the same shall on the expiry or sooner determination of the tenancy belong exclusively to the Landlord and the Landlord shall not be required to pay any compensation or


(LIEW MING CHOY)





damages in respect of the same. The Tenant shall not dismantle or remove any of the said renovations alternations or additions to the said Premises;

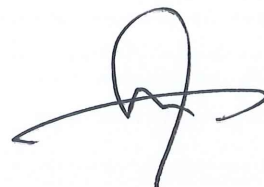
- (5) Not to do or permit to be done on the said premises anything which is immoral or will or may infringe any by the bye-laws or regulations in force or which may be or become a nuisance or annoyance or inconvenience to the Landlord or to the Tenants or occupiers of the adjacent properties.
- (6) Not to keep on the said premises any articles or things of dangerous or explosive or noxious nature.
- (7) To keep the said premises and all the Landlord's installations therein in good and tenantable repair and proper working order, fair wear and tear accepted.
- (8) Not to assign or sublet or part with the possession of or share the occupation or used of the said premises or any part thereof.
- (9) To use the said premises for the purposes(s) stated in Section 11 of the Schedule hereto only.
- (10) At the Tenant's own expense and responsibility to comply with the requirement of any Government or local authority under the provisions of any Act or local authority under the provisions of any Act or of any regulations or bye-laws which may be in force at any time during the term hereby granted insofar as such requirements relate to the Tenant.
- (11) To permit the Landlord and his agents, servants and others to enter upon the said premises at all reasonable times for the purposes of viewing the state and condition thereof or for any other reasonable purpose and forthwith to make good, at the Tenant's own expense within one month any defects caused by the Tenant's occupation of the premises, found upon the said premises of which notice shall be given by or on behalf of the Landlord.
- (12) Upon the determination of this Tenancy to deliver up to the Landlord the said premises in such state of repair condition order and preservation as shall be in strict compliance with the Tenant's stipulations herein contained and with all locks keys and fastenings complete.

II. The Landlord hereby agrees and covenants with the Tenants as follows:-

- (1) To pay all quit rents, rates, taxes, assessments and other outgoings which are or may hereafter be charged or imposed upon the premises and payable by the Landlord;
- (2) The Tenant paying the rent and performing and covering the covenants herein contained and on the Tenant's part to be performed and observed shall



(LIEW MING CHOY)



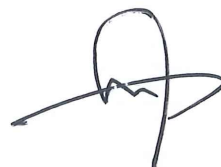
peaceably hold and enjoy the premises during the said term without any lawfully interruption or disturbance from or by the Landlord or any person rightfully claiming under or in trust for the Landlord;

III. **PROVIDED ALWAYS** and it is hereby agreed as follows:-

- (1) On the expiry of the term hereby created to yield up the said premises to the Landlord in good order and condition. Any signboard and/or advertisement board put up by the Tenant shall be removed at its own cost and expense on the expiry of the term hereby created.
- (2) If the rent hereby reserved or any part thereof shall remain unpaid for ten (10) days after becoming due (although no formal or legal demand shall have been made thereof) or in the case of a breach or non-performance of any of the stipulations herein mentioned to be performed by the Tenant it shall be lawful for the Landlord at any time thereafter to re-enter upon the said premises or any part thereof in the name of the whole and thereupon this tenancy shall absolutely cease and determine and the deposit shall be forfeited to the Landlord but Without Prejudice to any right of action the Landlord may have against the Tenant in respect of the unpaid rent or any antecedent breach of the stipulations herein contained.
- (3) Unless otherwise specifically provided for in Section 14 of the Schedule hereto, the stamp duty and legal fees in respect of this Agreement shall be borne and paid by the Tenant.
- (4) If the Tenant should determine the Tenancy hereby created at any time before the expiration of the term hereby created, the Deposit shall be forfeited to the Landlord. In the event that the Tenant shall intend to determine this Tenancy before the expiry of the term hereby created the Tenant shall give the Landlord a prior notice at the time and in the manner as set out in Section 13 of the Schedule hereto.
- (5) The Landlord shall refund to the Tenant the said deposit only on the expiry of the term of the Tenancy less such sum or sums, which may be found due and owing by the Tenant to the Landlord.
- (6) Any notice required to be given under this agreement shall be in writing and any notice to the Landlord shall be deemed to be sufficiently served if addressed to the Landlord and left at or sent by registered post by the Tenant at the address herein stated. Any notice sent by registered post shall be deemed to be given at the same time when in due course of post it would be expected to be delivered to the address to which it is sent.
- (7) No relaxation, forbearance, delay or indulgence by the Landlord in enforcing any of the terms and conditions of this agreement nor the granting of time by the Landlord to the Tenant shall prejudice, affect and restrict the rights and


(LIEW MING CHOY)





powers of the Landlord hereunder nor shall any waiver of any subsequent breach thereof.

- (8) In the event of the said premises of any part thereof being destroyed or damaged by fire (unless resulting from the act of default of the Tenant in consequence whereof payment of any insurance on the said premises shall be refused) and subject to the provisions for determination of this tenancy hereinafter contained in Clause (9) hereinafter the Landlord shall rebuild and reinstate the destroyed or damaged property to its original building plan and if the said premises shall in consequence of such destruction of damage be wholly or partially unfit for occupation and for carrying on business then and so often as the same shall happen to allow in respect of such period of unfitness a pro-rata abatement or the period of suspension of all or any of the rent the matter shall be referred to arbitration in the manner provided under Arbitration Act.
- (9) In the event the said premises shall be destroyed or damaged, as in Clause (8) mentioned above, the Landlord may determine the tenancy hereby created on the expiration of one (1) month after service on the Tenant of a notice of the Landlord's intention so to do and if the said premises be not commenced to be rebuilt within three (3) months after such destruction or damage the Tenant may determine the tenancy by a like notice served upon the Landlord and thereupon the Landlord shall refund to the Tenant all rental paid in advance for any period subsequent to such date of determination by such determination shall in either case be without prejudice to the rights and remedies of either party against the other in respect of any antecedent claim or breach of covenant.
- (10) If the Tenant shall pay the rents hereby reserve and perform and observe all the covenants and obligations therein on the Tenant's part contained then at the written request of the Tenant served upon the Landlord within three (3) months before the expiration of the term hereby granted (in this clause The Term Date) the Landlord shall grant to the Tenant at the expense of the Tenant a further term stated in Section 12 of the Schedule hereto of the demised premises from the term date at the rent to be mutually agreed between the parties hereto and in the event the parties hereto shall fail to reach such agreement then the rent payable shall based on the then current market value of similar premises within the same locality and further if such market rental value shall not be determined by a single arbitrator under the provision of the Arbitration Act or any statutory modification or re-enactment thereof for the time being in force and be payable as herein provided and subject in all other respects to the same stipulations as are herein contained except this clause for renewal.



(LIEW MING CHAY)

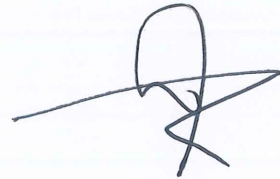


- (11) In this Agreement where the context so required words importing the singular number or the masculine gender include the plural number or feminine gender and words importing persons include corporation and vice versa.
- (12) This Agreement shall be binding upon the heirs, personal representatives, assigns and successors in title of the parties hereto.

IV. It is hereby expressly agreed by the parties hereto that the "Special Conditions" annexed hereinafter (if any) shall form part of this Agreement and that should there be an inconsistent or repugnant term or terms, the terms contained and inserted in the "Special Conditions" herein referred shall prevail over the same contained in Clauses I to III aforesaid.



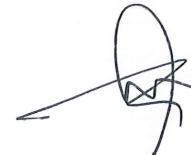
(LIEW MING CHOY)



SCHEDULE

- | | | |
|-----|-----------------------|---|
| 1. | Date of Agreement | The 15 th day of June , 2023 |
| 2. | Landlord | IPOH SY RECYCLE PLASTIC SDN BHD
PT.5992, Off Persiaran BG. Perdana 10,
Perindustrian BG. Perdana,
31550, Pusing, Perak. |
| 3. | Tenant | P2 OIL SDN BHD
PT 2662, Jalan Gopeng,
Tungzen Industrial Park,
Mukim Sungai Raya,
31300, Kampung Kepayang, Perak. |
| 4. | Premises | PT 2662, Jalan Gopeng,
Tungzen Industrial Park,
Mukim Sungai Raya,
31300, Kampung Kepayang, Perak. |
| 5. | Term | Three (3) years |
| 6. | Date of commencement | 15-06-2023 |
| 7. | Monthly Rental | First Three Months (15/6/2023 –
14/09/2023)
Ringgit Malaysia Six Thousand
(RM6,000.00).
Monthly rental shall be increased to Ringgit
Malaysia Twelve Thousand (RM12,000.00)
a month 15/09/2023 onwards. |
| 8. | Time for payment | Monthly rental within the 7 th day of each
month, payable in advance. |
| 9. | Deposit | Rental Deposit RM 24,000.00 (Two months)
Utilities Deposit RM 12,000.00.(One
Months) |
| 10. | Permitted Purpose (s) | Manufacturing & Storage only. |
| 11. | Terms of the option | To renew for another (3) years at prevailing
Market rate or an increase of not more than
10%. |
| 12. | Notice of Termination | Two (2) months notice in writing by the |


(LIEW MING CHOY)

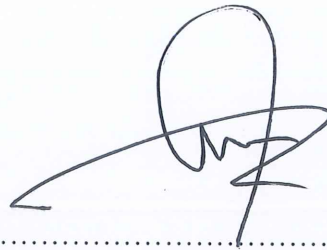
months rental.

13. Solicitor's cash and stamp duty To be borne by the Tenant respectively.

In WITNESS WHEREOF the parties hereto have hereunto set their hands the day and year first above stated.

Signed by the Landlord.

]]]]]



.....
IPOH S.Y. RECYCLE PLASTIC SDN. BHD.
DIRECTOR
CHOOI YOKE KWAN (690419-08-5236)

Signed by the Tenant

]]]]]



.....
P2 OIL SDN. BHD.
DIRECTOR
TAN SHENG YAN (930606-08-5071)

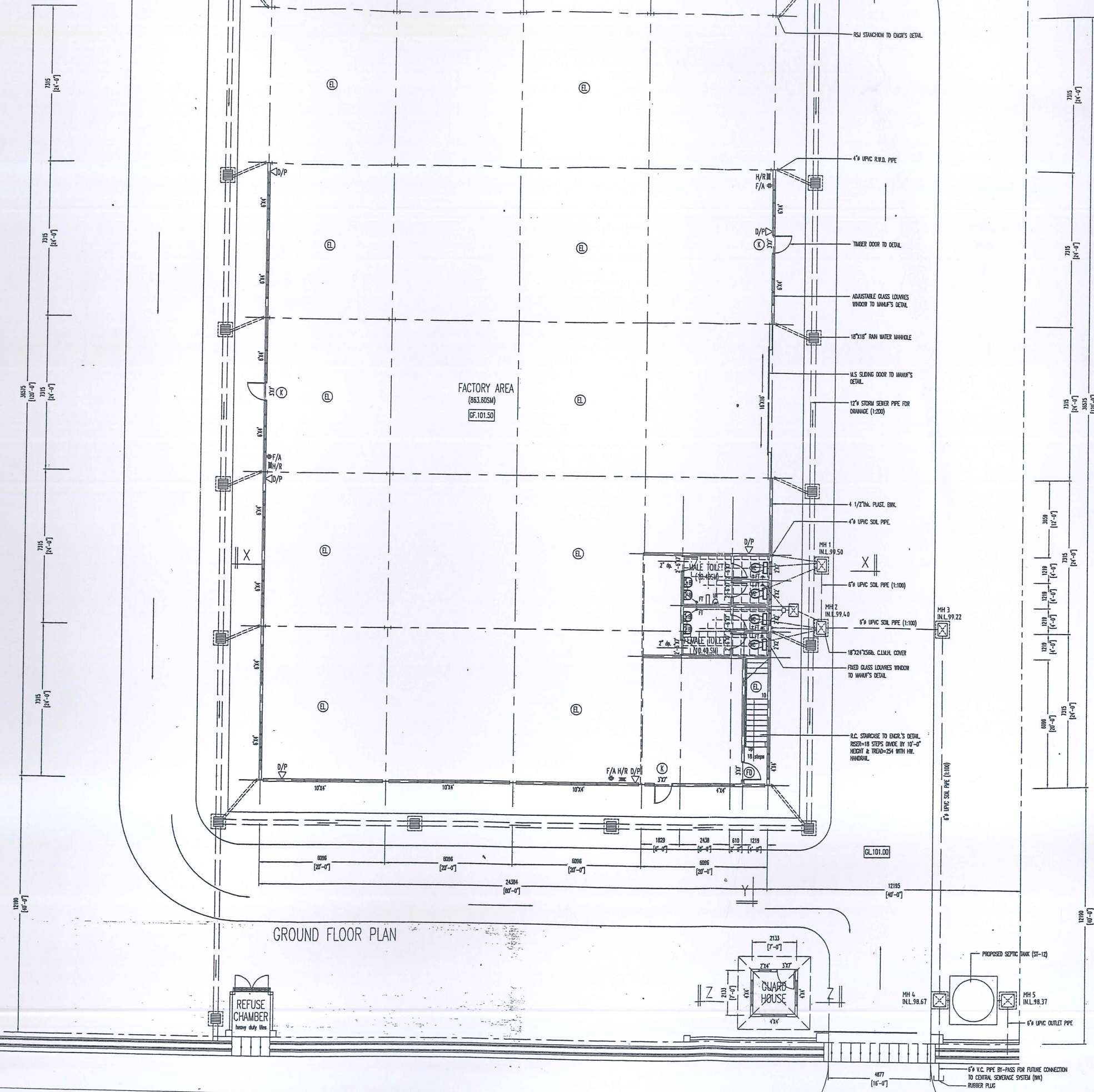


.....
P2 OIL SDN. BHD.
DIRECTOR
LIEW MING CHOY (631121-08-5065)



APPENDIX 1.3

EXISTING BUILDING PLANS



POPULATION EQUIVALENT (PE) CALCULATION

1. FACTORY AND WORKSHOP	= 40 PEOPLE
2. POPULATION EQUIVALENT (PE) REQUIRED	= 0.3 PE x PEOPLE
	= 0.3 PE x 40
	= 12 PE

KEHENDAK JABATAN BOMBA DAN PENYELAMAT

- PELAN TAPAK:
- ADAKAN BUAH PULU BOMBA JENIS TING DIA HAJA DENGAN PENGALIHAN AIR SEBANYAK 1135 LITER SEMBUT BUKU SETAP PULU BOMBA SEPERTIMANA YANG DITANDAKAN DI DALAM PELAK (SEDA JAW)
 - ADAKAN JALAN MASUK PERAKAS BOMBA (ACCESS ROAD) DENGAN KELEBARAN TINGGI KURANG 6 METER YANG BUKAH MENAWANG BOMBA 25 TAN SEPERTIMANA YANG DITANDAKAN DI DALAM PELAK
- KEHENDAK-KEHENDAK MA:
- PENYALAMAN ELEKTRIK HENDAKLAH DI DALAM KONDUIT LOGAM/ DITANDAI DI DALAM SIKEL. PEMASANGAN HENDAKLAH MENAMUKAN SYARAT-SYARAT PENUNTUN L.E.E. EDOS TERKAWAL
 - PENGALIHAN SALANG BANGUNAN HENDAKLAH MENEPATI KEHENDAK-KEHENDAK UREB 1984 JAWAL KELAPAN
 - SEKALI DINDING PEMERKAS DALAMAN HENDAKLAH DIA JENIS BUKAHAN KAT 2 JAW DAN DIA JENIS YANG DIBERKAWAL OLEH JABATAN BOMBA DAN PENYELAMAT MALAYSIA
 - ADAKAN LAMPU HENDAKLAH KESEKUTANAN YANG MENYALAKAN DIA KUSA KURAN SEPERTIMANA YANG DITANDAKAN DI DALAM PELAK. LAMPU-LAMPU TERSEBUT HENDAKLAH DIA JENIS YANG DIBERKAWAL OLEH JABATAN BOMBA DAN PENYELAMAT MALAYSIA
 - ADAKAN LAMPU TINGGI "KELLUM" KESEKUTANAN YANG MENYALAKAN DIA KUSA KURAN SEPERTIMANA YANG DITANDAKAN DI DALAM PELAK. LAMPU-LAMPU TERSEBUT HENDAKLAH DIA JENIS YANG DIBERKAWAL OLEH JABATAN BOMBA DAN PENYELAMAT MALAYSIA
 - DINDING PEMERKAS ANDARA KILANG DAN PELAK HENDAKLAH SETEBAL 225mm DAN DINDING SEBANYAK 150mm BUKAH BANGUNG SEPERTIMANA YANG DITANDAKAN DI DALAM PELAK
 - ADAKAN SISTEM SALUR BANTU MATA (HOSE REEL) MENGIKUT SYARAT-SYARAT PENUNTUN TAJA TERBUT AMALAN PAMAM BRITISH ATAU MATA-PAMAM PENUNTUN YANG DIBERKAWAL OLEH JABATAN BOMBA DAN PENYELAMAT MALAYSIA
 - ADAKAN SISTEM PENGESKAN KEKAWAN JENIS PEZAH KACA MENGIKUT SYARAT-SYARAT PENUNTUN TAJA TERBUT AMALAN PAMAM BRITISH ATAU MATA-PAMAM PENUNTUN YANG DIBERKAWAL OLEH JABATAN BOMBA DAN PENYELAMAT MALAYSIA

- PENGINGATAN:**
- SEKALI SYARAT-SYARAT YANG DIBERKAWAL ADALAH TERKAWAL KEPADA REKA BENTUK DAN KEDARAN BANGUNAN TERSEBUT. SEKUTIMANA TERBUT SEKUTIMANA YANG DITANDAKAN KE JAWA REKA BENTUK JAWA KEDARAN SEPERTI YANG DITANDAKAN DI ATAS PELAK. MATA HENDAKLAH DITANDAKAN KE JAWA REKA BENTUK DITANDAKAN
 - SEKALI PEMERKAS BUKAH DAN PENGESKANAN YANG BERTAWA DENGAN KESEKUTANAN KEKAWAN BUKI PROJEK CADANGAN SEKALI SISTEM PENGESKANAN KEKAWAN HENDAKLAH MENUTUR UREB 1984 DIA PENUNTUN-PEUNTUN YANG DITANDAKAN SIKAL YANG DIBERKAWAL OLEH JABATAN BOMBA DAN PENYELAMAT MALAYSIA
 - BUK SEKALI KILANG PERINDUSTRIAN BUKAH, DINDING, STOR, DIA KEDIN YANG TERBUT DI DALAM PEMERKAS, PENGESKANAN, PENYALAMAN, PENGESKANAN DAN PENUNTUN BUKAH-BUKAH KUSA ATAU BUKAH-BUKAH YANG MENYALAKAN KESEKUTANAN LUKA BUKAH HENDAKLAH MENYALAKAN BUTIRAN LUKA BUKAH BUKAH BUKAH BUKAH, SPAT-SPAT SEKALI JAWA, KURANTU DIA CAVA BERTAWA

BRIEF SPECIFICATIONS

- Building works shall be supervised by the Architect.
- R.C. details shall be submitted and approved before building operations commence.
- All R.C. shall be 1:2:4 mix and mass concrete 1:3:6, or to any's specification & requirement.
- All 4.5" bats, shall be in cement mortar 1:3 and reinforced every 4th course with "rebar".
- Pipe water supply shall be provided to L.A.P. specification.
- Provide iron gratings to all drain outlets.
- All sanitary appliances shall be of the brands of manufacture to SPM standard.
- All sanitary appliances shall be provided with proper traps to SPM standard.
- All pipes shall be of an approved brand and make, complying with relevant SPM Standard Specifications and manufactured by an approved manufacturer.
- Figured dimensions must be taken in preference to those measured by scale.
- No building materials are to be deposited on any public streets, drains side table or open space.
- All building materials and debris shall be cleared from site on completion of building.
- No occupation certificate will be issued unless all building materials and refuse are cleared from the site.
- Concrete details over door and window frames must be properly reinforced according to the span of the details and supported independently without bearing the load directly over the frames.
- All foundations shall be confined within the limits of the lot boundary and no encroachment shall be permitted outside the property limits.
- All roads & drains to be constructed in accordance to D.B.L.'S.
- All existing broken drain to be made good & replaced on completion of work.
- Survey works to be carried out before building operation commence.
- Prevents to be applied to concrete in accordance with the SPM requirements.

- BOMBA LEGEND :**
- H/R HOSE REEL
 - D/P 9 KG DRY POWDER FIRE EXTINGUISHER
 - F/A FIRE ALARM
 - Ⓚ SIGN 'KELLUM'
 - Ⓛ EMERGENCY LIGHT
 - Ⓛ FIRE DOOR
 - Ⓛ EXISTING HYDRANT

PROJEK :
**CADANGAN MEMBINA SEBUAH KILANG
 DI ATAS PT 2662, KAWASAN
 PERINDUSTRIAN TUNGXEN, GOPENG,
 PERAK DARUL RIDZUAN
 UNTUK**

TETUAN APEX ENTITY SDN BHD.

NAMA PEMUK :
APEX ENTITY SDN. BHD.
 NAMA : LEONG PECK KUEN (DIRECTOR)
 NO. K/P : 751015-14-5286
 ALAMAT : NO. 7, JALAN INDUSTRI USJ 1/2,
 TAMAN PERINDUSTRIAN USJ 1,
 47600 SUBANG JAYA, SELANGOR DARUL EHSAN.

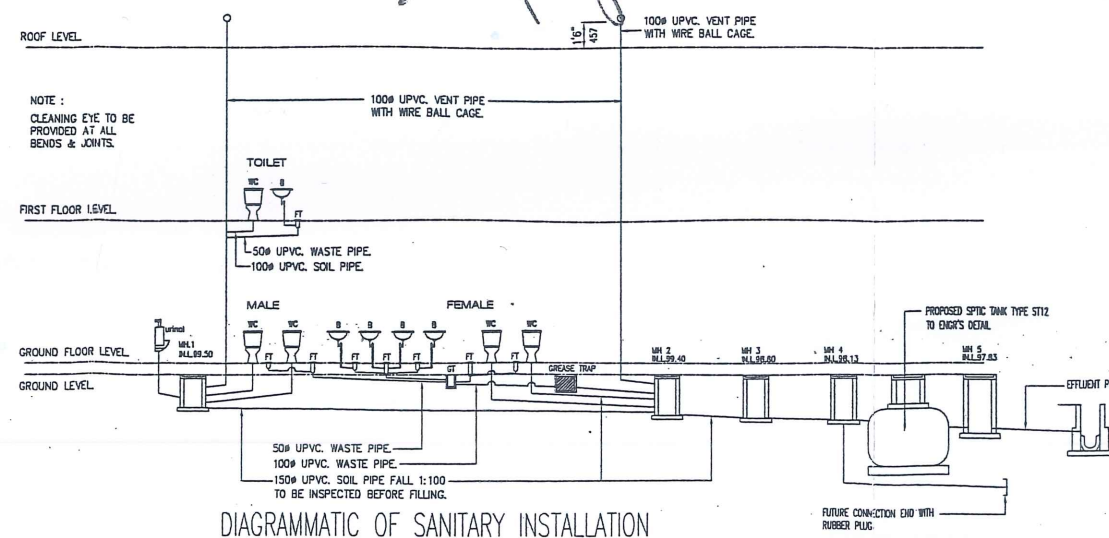
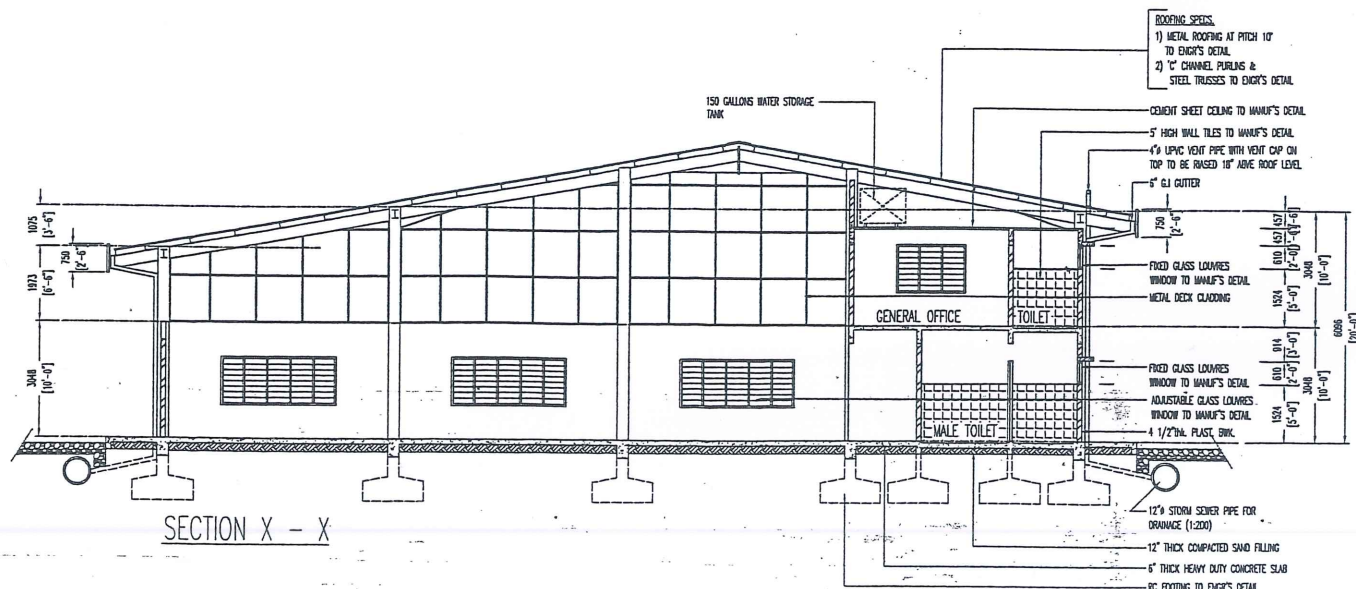
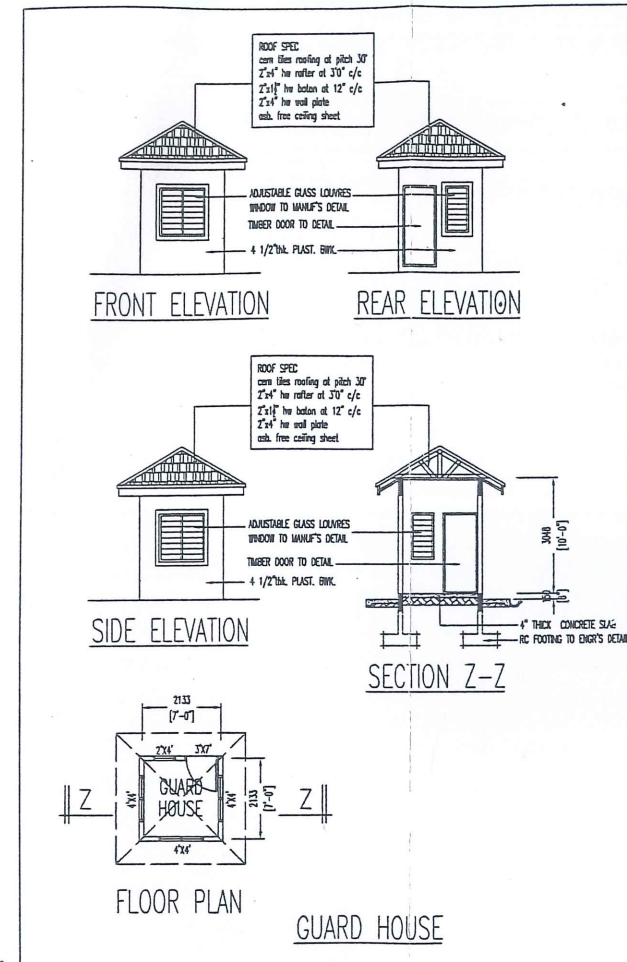
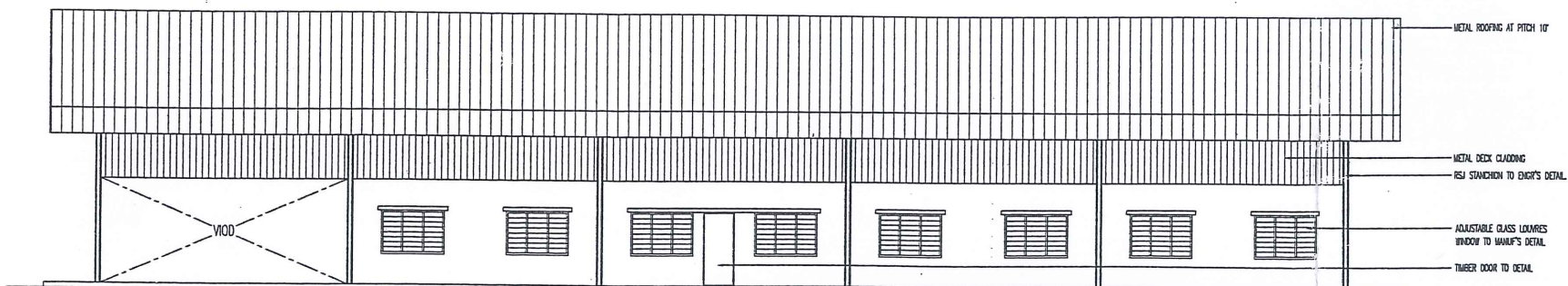
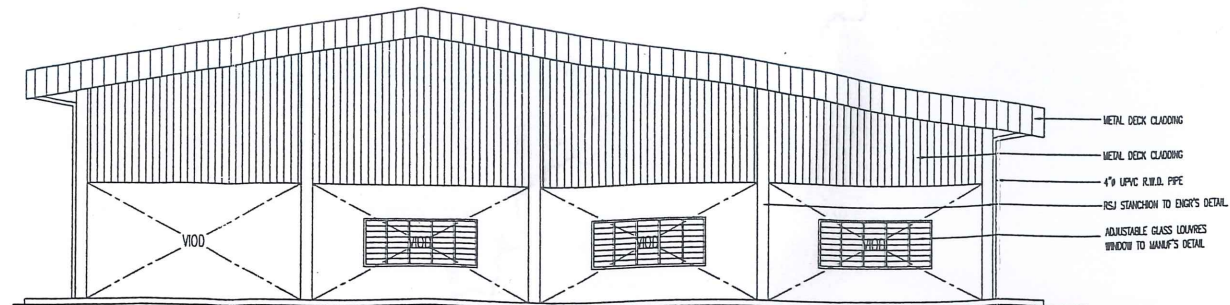
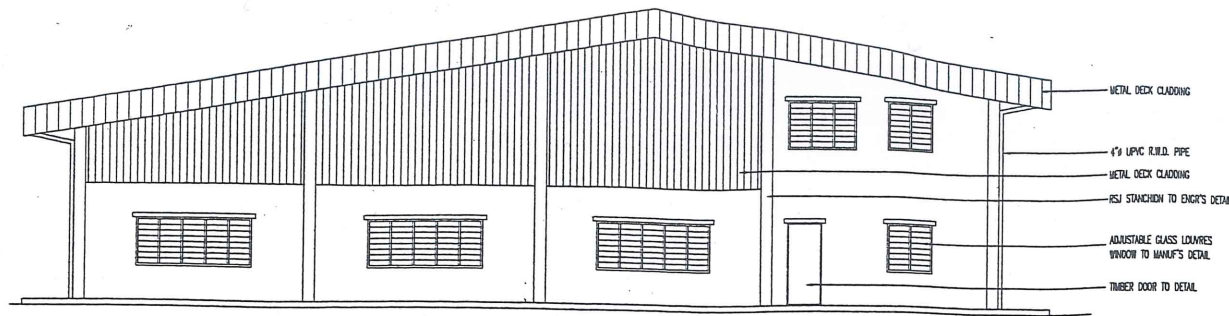
TAKIR LUKSAM :
GROUND FLOOR PLAN

TAWANGKAWAN JURUTERA
 SAYA MENGENALKAN BAHAWA BUTIR-BUTIR K.T ADA MENGIKUT TATA AMALAN PAMAM BRITISH BS 8110 / CP114 / BS5950 / BS449 DAN MENEMPAH DAWANGKAWAN SEPERTIMANA ATAS REKABENTUK DAN PENGESKANAN KERJA.

IR. TAN SWEE JOO
 BE (S'pore) MEAL. P.Eng

LT CONSULTANCY
 CIVIL & STRUCTURAL CONSULTING ENGINEERS
 NO. 105, JALAN CHAMBERLAIN HILL, TAMAN CHATEAU,
 30250 PERAK DARUL RIDZUAN,
 TEL: 05-2438935 FAX: 05-2438981

DUNGS OLEN :	PICK KUEN	SEKAL :	1:100
DESEKAM OLEN :	GOH	TARIKH :	05. 2007
DIREKARDUK OLEN :		DILLUSKUK OLEN :	
NOL LUKSAM :	B/LTG 1168/07/ACSB/5/2		



PROJEK :

CADANGAN MEMBINA SEBUAH KILANG
DI ATAS PT 2662, KAWASAN
PERINDUSTRIAN TUNGXEN, GOPENG,
PERAK DARUL RIDZUAN
UNTUK

TETUAN APEX ENTITY SDN BHD.

NAMA PEMILIK :

APEX ENTITY SDN. BHD.
NAMA : LEDING PECK KUEN (DIRECTOR)
NO. K/P : 751015-14-5286
ALAMAT : NO. 488, JALAN CHEE WAN,
IPOH 30250, PERAK.

TAKWIKAL :

ELEVATION, SECTION X - X,
GUARD HOUSE DETAIL
AND DIAGRAMMATIC OF SANITARY INSTALLATION

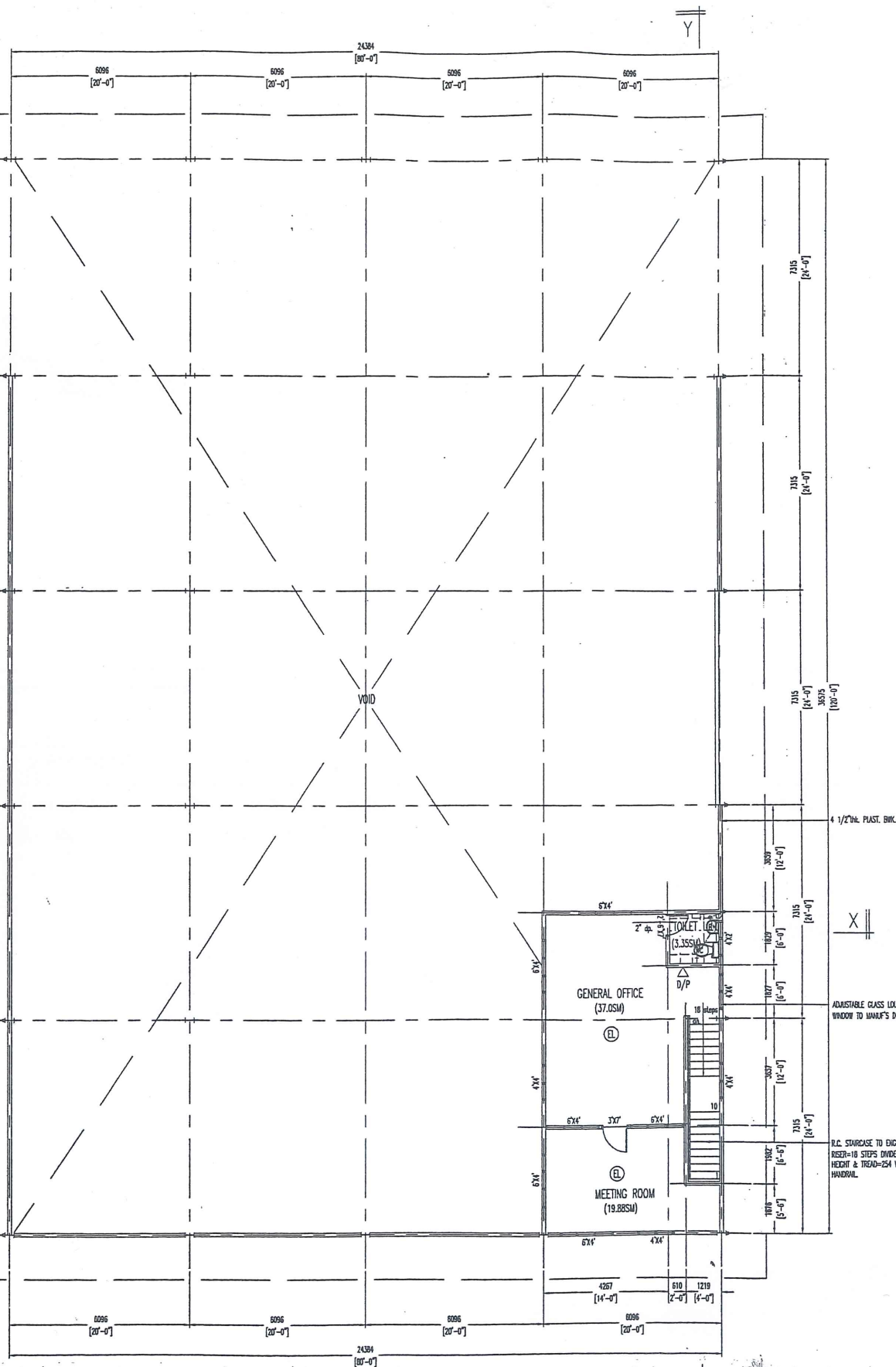
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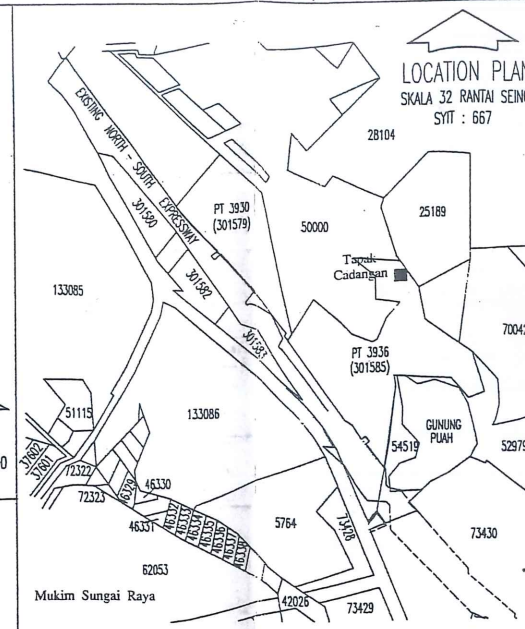
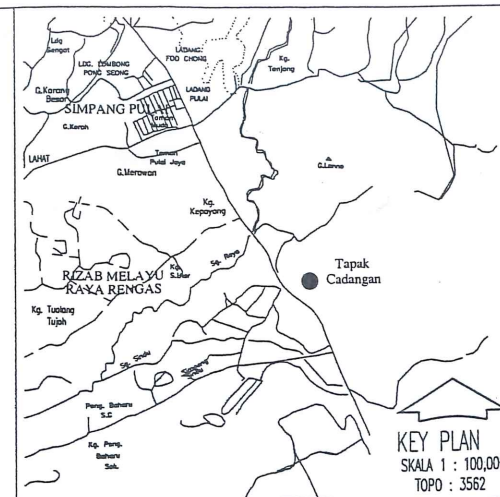
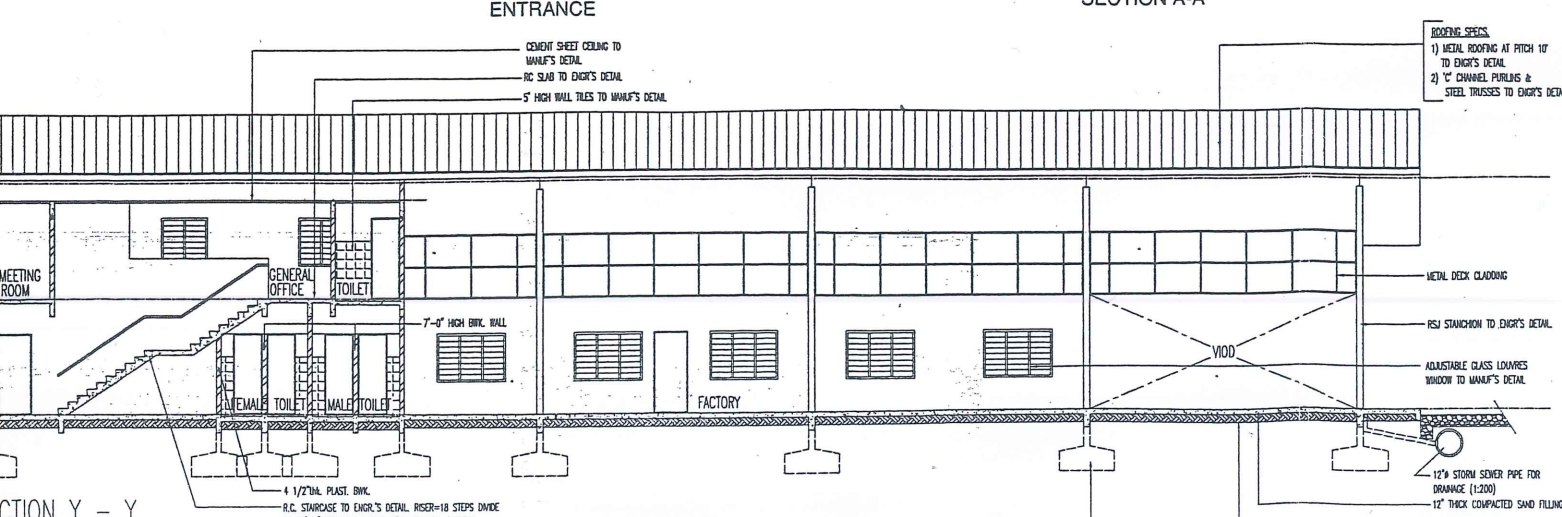
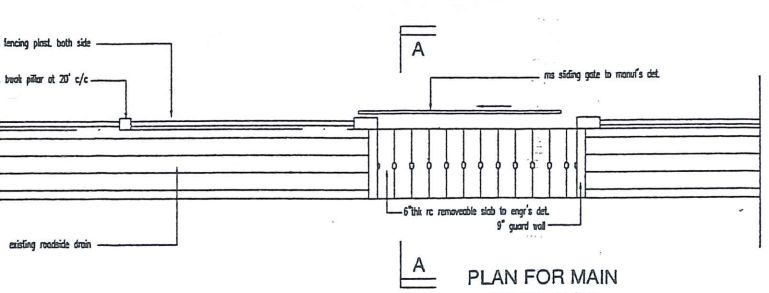
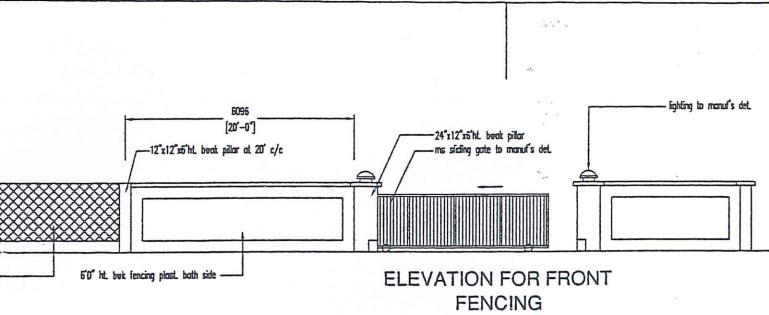
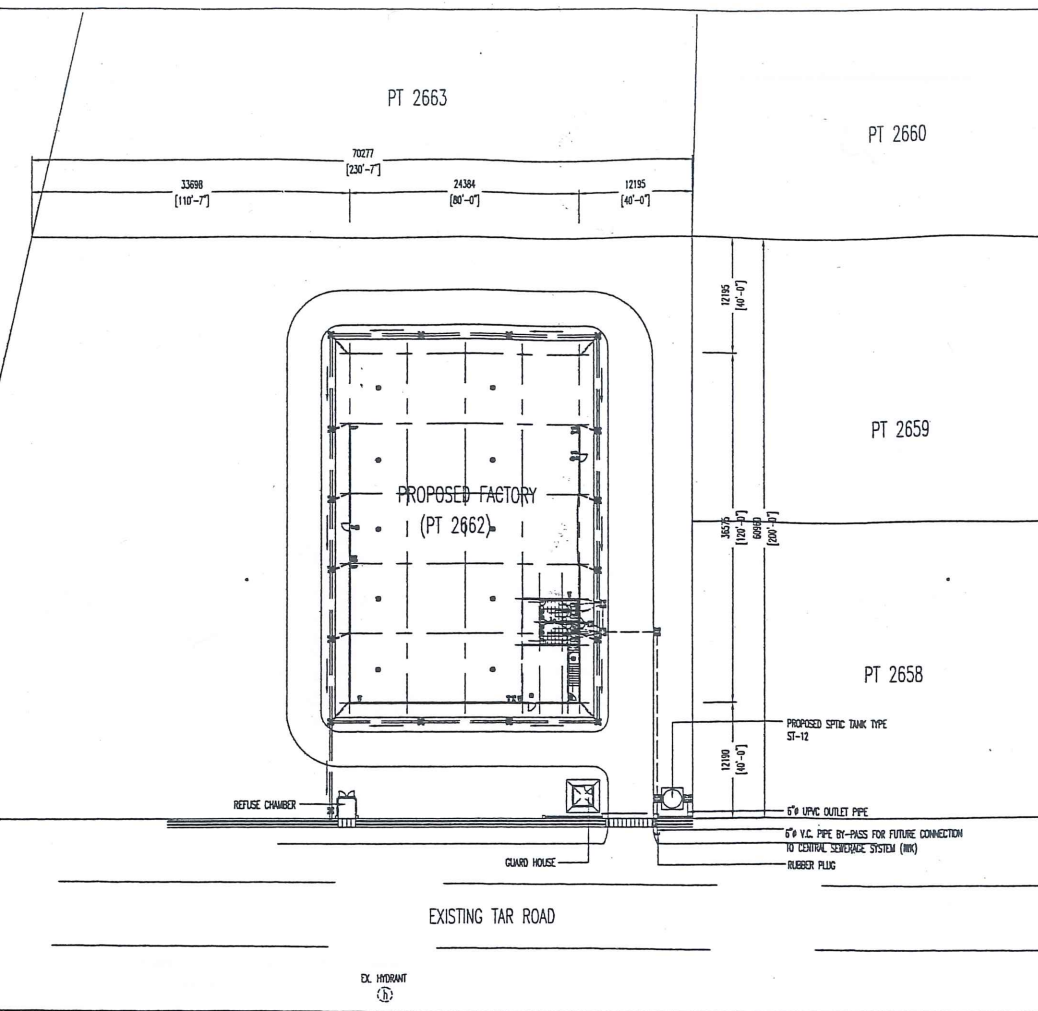
SAYA MENEGSAHKAN BAHAWA BUTIR-BUTIR K.T
MENGIKUT TATA AMALAN PAJAN BRITISH BS 811
CP114 / BS5950 / BS449 DAN MENEMPAH
TANGGUNGJAWAB SEPENUHNYA ATAS REKABENTU
DAN PENGAWASAN KERJA.

IR. TAN SWEE JOO
BE (Spond) MEM. P.Eng

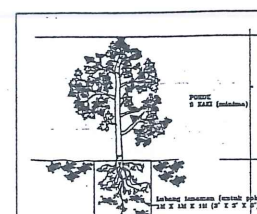
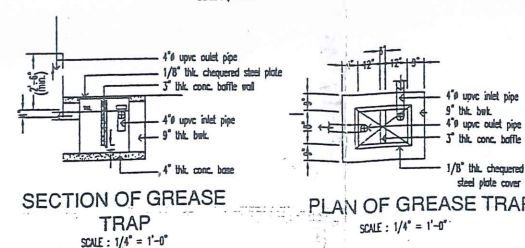
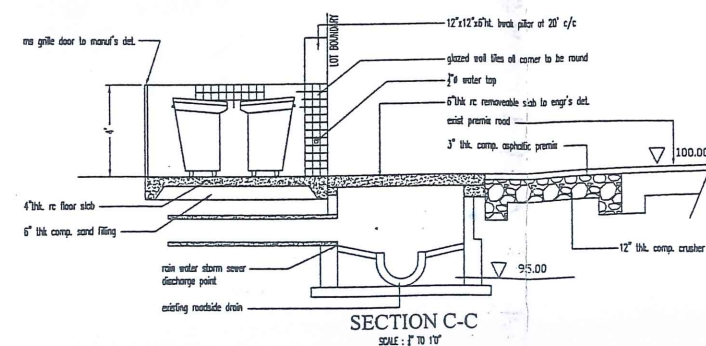
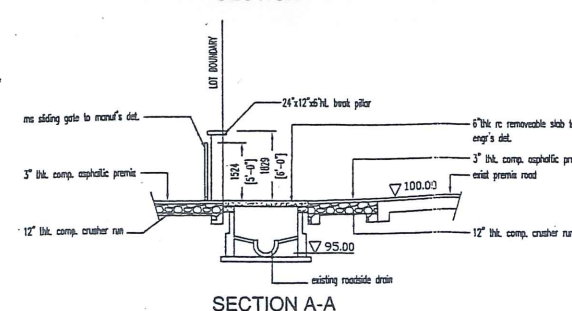
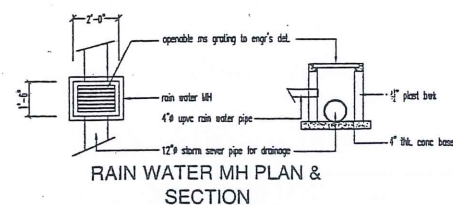
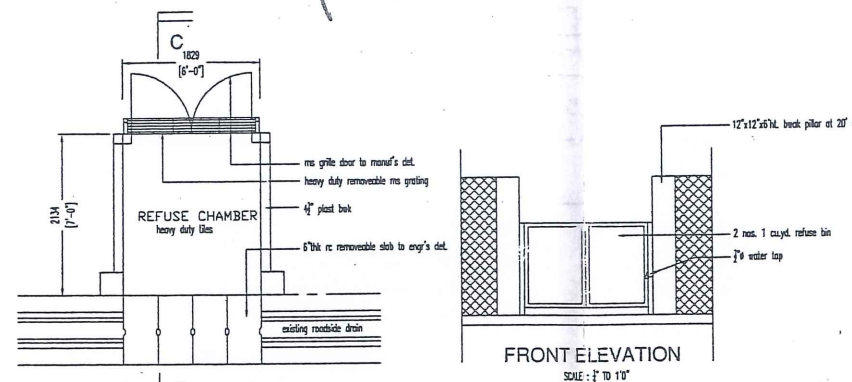
LT CONSULTANCY
CIVIL & STRUCTURAL CONSULTING ENGINEERS
NO. 105, JALAN CHAMBERLAIN HILL, TAMAN CHANTAL,
30250 IPOH, PERAK DARUL RIDZUAN.
TEL: 05-2458035 FAX: 05-2458031

DALUJUK OLEH :	PICK KUEN	SKALA :	1:100
DISEKUT OLEH :	GM	TARIKH :	05. 2007
DIREKABENTUK OLEH :		DILAKSANAKAN OLEH :	
NO. LUKSAS :	B/LTG 1168/07/ACSB/5/4		





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- SYARAT-SYARAT TANAMAN POKOK :**
1. PEJALU HENDAKKAN TANAMAN POKOK-POKOK REJANG SEHINGGA 3 KAW DENDAM SELAMA 40 KAW HATI DARI HILANG LUT.
 2. LUBANG UNTUK TANAM POKOK HENDAKKAN SELUSUS 2 KAW GAREN PUSAT DAI 2 KAW 6 INCI DALAM DAN DITAMBUH DENGAN TANAH ATAS (TOP SOIL) DAN DISERAPKAN DENGAN KILAR KONKRET SEHINGGA PEJALU KAW DENDAM.
 3. POKOK-POKOK HENDAKKAN DENGAN BERTAMBAH LONJOKAN.
 4. POKOK-POKOK DAN JENIS TANAH DENDAM HENDAKKAN DISEPANJANG SELUSUS JALAN.
 5. POKOK-POKOK REJANG YANG DIPERAKU ADALAH SEPERTI :
 - a) BUNGA TANJANG

- BOMBA LEGEND :**
- H/R HOSE REEL
 - <D/P 9 KG DRY POWDER FIRE EXTINGUISHER
 - F/A FIRE ALARM
 - ⊗ SIGN 'YELLOW'
 - Ⓛ EMERGENCY LIGHT
 - Ⓜ FIRE DOOR
 - Ⓢ EXISTING HYDRANT

CADANGAN MEMBINA SEBUAH KILANG DI ATAS PT 2662, KAWASAN PERINDUSTRIAN TUNGXEN, COPENG, PERAK DARUL RIDZUAN UNTUK

TETUAN APEX ENTITY SDN BHD.

RUWA PEMILIK :

APEX ENTITY SDN. BHD.
 NAMA : LEONG PECK KUEN (DIRECTOR)
 NO. K/P : 751015-14-5286
 ALAMAT : NO. 48B, JALAN CHEE WAN,
 IPOH 30250, PERAK.

DAK LUKSAS :

SITE PLAN, LOCATION PLAN & KEY PLAN, GENERAL DETAILS AND SECTION Y - Y

TANDAKAWA JURUTERA

SIYA MENGESAKAN BAHAWA BUTIR-BUTIR K.T ADA MENGIKUT TATA AMALAN PAMM BRITISH BS 8110 / CP114 / BS5950 / BS449 DAN MENEDIRI TANGGUNGJAWAB SEPENUHNYA ATAS REKABENTUK DAN PENGAKSAN KERJA.

IR. TAN SWEET JOO
 BE (S'pore) MEM. P.Eng

LT CONSULTANCY
 CIVIL & STRUCTURAL CONSULTING ENGINEERS
 NO. 115, JALAN CHAMBERLAIN HILL, TAMAN CHATEAU,
 30250 IPOH, PERAK DARUL RIDZUAN.
 TEL: 05-2438035 FAX: 05-2438081

DALUS OLEH : PECK KUEN **SEKIL :** AS SHOH

DISEKAW OLEH : COH **TARIKH :** DES. 2007

DIREKABENTUK OLEH : **DOKULUSAN OLEH :**

APPENDIX 1.4
IP APPLICATION RESULT LETTER



Ruj. Tuan : GE/P2OSB/23/07/24
Ruj. Kami : AS(B)A91/110/621/017 Jld 102 (34)
Tarikh : 14 Ogos 2023



P2 Oil Sdn. Bhd.
Lot 225111, Jalan Gopeng
Tungzen Industrial Park
31300 Kampung Kepayang
PERAK DARUL RIDZUAN

Tuan,

PERMOHONAN INPUT PEMBANGUNAN BAGI "PROPOSED PYROLYSIS PLANT AT LOT 225111, JALAN GOPENG, TUNZEN INDUSTRIAL PARK, MUKIM SUNGAI RAYA, 31300 KAMPUNG KEPAYANG, PERAK " UNTUK TETUAN P2 OIL SDN. BHD.

Saya adalah diarah merujuk kepada permohonan tuan berkenaan perkara di atas.

2. Setelah meneliti permohonan yang dikemukakan, Jabatan mendapati tapak cadangan adalah untuk tujuan permohonan pembangunan industri bagi "**proposed pyrolysis plant**" di Mukim Sungai Raya, Daerah Kinta.

3. Sehubungan dengan ini, ulasan Jabatan adalah seperti berikut sepertimana yang telah diputuskan dalam **Mesyuarat Jawatankuasa Penilaian Permohonan Bahagian Pembangunan Bil. 19/2023** bertarikh **11 Ogos 2023**, adalah aktiviti tersebut tertakluk kepada **Perintah Kualiti Alam Sekeliling (Aktiviti Yang Ditetapkan) (Penilaian Kesan Kepada Alam Sekeliling) 2015** iaitu:

Aktiviti 14: Pengolahan Dan Pelupusan Buangan (Jadual Pertama)

- (b) Sisa Pepejal
- (ii) Pembinaan loji pulih guna atau loji kitar semula

yang mengkehendaki penggerak projek mengemukakan **Laporan Penilaian Kesan Kepada Alam Sekeliling (EIA)** untuk kelulusan Ketua Pengarah Kualiti Alam Sekeliling sebelum kerja-kerja boleh dimulakan sepertimana yang diperuntukan di bawah seksyen 34A, Akta Kualiti Alam Sekeliling, 1974.

...2/

Ruj. Kami : AS(B)A91/110/621/017 Jld 102 (34)
Tarikh : 14 Ogos 2023

4. Sehubungan itu, pihak pemohon perlu mengemukakan laporan EIA mengikut garis panduan '**Environmental Impact Assessment Guideline In Malaysia 2016**' yang diterbitkan oleh Jabatan Alam Sekitar. Pihak tuan diminta supaya merujuk portal Enviro Knowledge Management Centre (EKMC) di <https://enviro.doe.gov.my>.

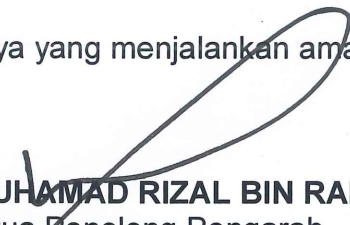
5. Kegagalan **pihak tuan** mengemukakan laporan EIA dan mendapatkan kelulusan daripada Jabatan ini terlebih dahulu sebelum aktiviti berkenaan dimulakan merupakan satu kesalahan di bawah Seksyen 34A, Akta Kualiti Alam Sekeliling, 1974 dan boleh mendedahkan pihak pemohon kepada tindakan undang-undang yang lebih tegas.

6. Kerjasama dan perhatian tuan dalam melestarikan alam sekitar adalah sangat dihargai dan diucapkan terima kasih.

Sekian, terima kasih.

"MALAYSIA MADANI"
"BERKHIDMAT UNTUK NEGARA"

Saya yang menjalankan amanah,


(MUHAMMAD RIZAL BIN RAMLI)

Ketua Penolong Pengarah
Bahagian Pembangunan
b.p. Pengarah Jabatan Alam Sekitar Negeri Perak

s.k.:

Green Earth Consultancy Sdn. Bhd.
No. 28, Jalan Indah ¼
Taman Universiti Indah
43300 Seri Kembangan
SELANGOR DARUL EHASAN

APPENDIX 1.5
SAMM CERTIFICATION OF
ENVCHEM CONSULTS SDN BHD

NO: SAMM 686

Page: 1 of 9

LABORATORY LOCATION:
(PERMANENT LABORATORY)**ENVICHEM CONSULTS SDN. BHD.**
NO 5A-B & 7A-B
LORONG TEMENGGUNG 15A
TAMAN EVERGREEN
41200 KLANG
SELANGOR, MALAYSIA**FIELD OF TESTING:****CHEMICAL**

This laboratory has demonstrated its technical competence to operate in accordance with MS ISO/IEC 17025:2017 (ISO/IEC 17025:2017).

This laboratory's fulfillment of the requirements of ISO/IEC 17025 means the laboratory meets both the technical competence requirements and management system requirements that are necessary for it to consistently deliver technically valid test results and calibrations. The management system requirements in ISO/IEC 17025 are written in language relevant to laboratory operations and operate generally in accordance with the principles of ISO 9001 (see Joint ISO-ILAC-IAF Communiqué dated April 2017).

SCOPE OF TESTING: CHEMICAL

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Wastewater Effluent/Wastewater, Potable and Domestic/Industrial Water and Sewage	pH	APHA 4500 H ⁺ B Electrometric Method
	Total Suspended Solid	APHA 2540 D Dried at (103-105)°C
	Biochemical Oxygen Demand (BOD ₅) at 20°C	APHA 5210 B 5-Day BOD Test
	Chemical Oxygen Demand (COD)	APHA 5220 C Closed Reflux, Titrimetric Method
	Oil and Grease	APHA 5520 B Liquid-liquid, Partition Gravimetric Method
	Dissolved Oxygen (DO)	APHA 4500 O-G Membrane Electrode Method
	Tin (Sn)	In-house method EC-SM-011, based on APHA 3114 B.
	Arsenic (As)	APHA 3114 B. Continuous Hydride Generation/ Atomic Absorption Spectrometric (MODIFIED)

NO: SAMM 686

Page: 2 of 9

SCOPE OF TESTING: CHEMICAL

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Wastewater Effluent/Wastewater, Potable and Domestic/Industrial Water and Sewage (Continued..)	(Continued)	
	Chromium Hexavalent (Cr^{6+})	APHA 3500-Cr B. Colorimetric Method
	Boron (B)	APHA 4500 – B C. Carmine Method
	Barium (Ba)	APHA 3111 D. Direct Nitrous-Oxide Acetylene Flame Method
	Flouride	APHA 4500-F ⁻ D. SPADNS Method
	Color, ADMI	APHA 2120 F. ADMI Weighted-Ordinate Spectrophotometric Method
	Ammoniacal Nitrogen	APHA 4500 NH_3 ⁻ B, F. Preliminary Distillation and Phenate Method.
	Phenol	APHA 5530 B, D. Preliminary Distillation and Direct-Photometric Method
	Free Chlorine	APHA 4500 Cl_2 ⁻ F. DPD Ferrous Titrimetric Method
	Sulphide	APHA 4500-S ²⁻ F. Iodometric Method
	Preliminary Treatment of Sample	APHA 3030 E. Nitric Acid Digestion APHA 3030 F. Nitric Acid & Hydrochloric Acid Digestion
	Cyanide	In-House Method EC-SM-020, based on APHA 4500 CN-E
	Formaldehyde	In-House Method EC-SM-021
	Selenium	APHA 3500 Se B (Sample Preparation) + APHA 3114 B Hydride Generation Atomic Absorption Spectrometric
	Total Phosphorus	APHA 4500 –P B(5) (Sample Preparation) & APHA 4500 –P C (Colorimetric Method)
	Total Nitrogen	In-House Method CC-SM-024 based on APHA 4500 N C

NO: SAMM 686

Page: 3 of 9

SCOPE OF TESTING: CHEMICAL

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Wastewater Effluent/Wastewater, Potable and Domestic/Industrial Water and Sewage (Continued..)	(Continued)	
	Nitrate Nitrogen (NO ₃) Nitrite Nitrogen (NO ₂)	APHA 4500 NO ₃ ⁻ E In-House Method EC-SM-030 based on APHA NO ₂ - B
	Total Dissolved Solid (TDS)/Conductivity/Salinity	In-House Method EC-SM-023 based on APHA 2510 B
	Cadmium (Cd)	APHA 3111 B. Direct Air- Acetylene Flame Method
	Nickel (Ni)	
	Copper (Cu)	
	Iron (Fe)	
	Manganese (Mn)	
	Zinc (Zn)	
	Plumbum (Pb)	
	Argentum (Ag)	
	Chromium (Cr)	
	Chromium, Trivalent	In-House Method EC-SM-022 based on APHA 3111 B / APHA 3120 B & APHA 3500 Cr B
	Phosphate (PO ₄ ³⁻)	HACH Method 8048
	Sulfate (SO ₄ ²⁻)	HACH Method 8051
	Silica as SiO ₂	HACH Method 8185
	Nitrate (NO ₃ ⁻)	HACH Method 8039
	Nitrite (NO ₂ ⁻)	HACH Method 8507
Wastewater Effluent/Wastewater, and Sewage	Aluminium (Al)	APHA 3111 D. Direct Nitrous-Oxide Acetylene Flame Method
	Mercury (Hg)	APHA 3112 B. Cold-Vapor Atomic Absorption Spectrometric Method (MODIFIED).

Scan this QR Code or visit www.ism.gov.my/cab-directories for the current scope of accreditation

NO: SAMM 686

Page: 4 of 9

SCOPE OF TESTING: CHEMICAL

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Wastewater Effluent/Wastewater, Potable and Domestic/Industrial Water and Sewage (Continued..)	(Continued) Aluminium (Al) Arsenic (As) Barium (Ba) Boron (B) Cadmium (Cd) Calcium (Ca) Chromium (Cr) Cobalt (Co) Copper (Cu) Iron (Fe) Lead (Pb) Magnesium (Mg) Manganese (Mn) Nickel (Ni) Potassium (K) Selenium (Se) Silver (Ag) Sodium (Na) Thallium (Tl) Zinc (Zn)	APHA 3120 B (ICP-OES)
Sediment, Sludge, Soil, Solid, Waste Samples	Aluminium (Al) Barium (Ba) Cadmium (Cd) Calcium (Ca) Chromium (Cr) Cobalt (Co) Copper (Cu) Iron (Fe) Lead (Pb) Magnesium (Mg) Manganese (Mn) Nickel (Ni) Silver (Ag) Thallium (Tl) Zinc (Zn)	USEPA 3050 B & APHA 3120 B (ICP-OES)

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NO: SAMM 686

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SCOPE OF TESTING: CHEMICAL

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Environment Monitoring		
Ambient Air Monitoring (TSP)	Determination of Suspended Particulate Matter in the Atmosphere (High-Volume Method) Using High Volume Sample (HVS)	USEPA 40 Part 50, Appendix B
Chemical Exposure Monitoring	Heavy Metal – Lead	NIOSH 7082
	Heavy Metal – Mercury	NIOSH 6009
Air Quality Measurement / Ambient Air Monitoring / Indoor Air Quality Monitoring	Particulate Matter As PM _{2.5}	USEPA 40 Part 50, Appendix L
	Particulate Matter As PM ₁₀	USEPA 40 Part 50, Appendix J
	Sulphur Dioxide (SO ₂)	ISC 704A (Determination of Sulphur Dioxide Content of the Atmosphere)
Ambient Air Monitoring	Nitrogen Dioxide (NO ₂)	In-House Method based on ISC 408 (Analysis for Atmospheric Nitrogen Dioxide)
Chemical Exposure Monitoring and Air Quality Monitoring	Cadmium, Cd	NIOSH 7048
	Chromium, Cr	NIOSH 7024
	Copper, Cu	NIOSH 7029
	Zinc, Zn	NIOSH 7030
	Ammonia	In-House Method EC-CE-009 (Based on NIOSH 6015 & APHA 4500 – NH ₃ -F)
	Chromium Hexavalent, Cr ⁶⁺	NIOSH 7600
	Aluminium (Al)	} NIOSH 7301
	Antimony (Sb)	
	Arsenic (As)	
	Barium (Ba)	
	Beryllium (Be)	
	Cadmium (Cd)	
	Calcium (Ca)	
	Chromium (Cr)	
	Cobalt (Co)	
	Copper (Cu)	
	Iron (Fe)	

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NO: SAMM 686

Page: 6 of 9

SCOPE OF TESTING: CHEMICAL

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NO: SAMM 686

Page: 7 of 9

Note:

1. APHA – American Public Health Association (21st Edition)
2. NIOSH – National Institute of Occupational Safety and Health
3. USEPA – United States Environmental Protection Agency
4. ISC – Intersociety Committee
5. FASS – Flame Atomic Absorption Spectrometer
6. UV-VIS – Ultraviolet – Visible Spectroscopy
7. GC-FID – Gas Chromatography – Flame Ionization Detector

Signatories:

- | | | |
|----|---|-----------------------------------|
| 1. | * Dr. Shanmugam A/L Suberamaniam | IKM No.: M/1095/2640/96/99 |
| 2. | Dr. Nagendran A/L Periaiah | IKM No.: M/3186/4722/05/11 |
| 3. | Saipul Bin Mohd Saleh | IKM No.: L/3191/9566/22 |

* Note: Non-resident Signatory

NO: SAMM 686

Page: 8 of 9

SCOPE OF TESTING: CHEMICAL**SITE TESTING: CATEGORY I**

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Environment Monitoring		
Wastewater Effluent/Wastewater, Potable and Domestic/Industrial Water and Sewage	Temperature (On Site) pH (On Site) Dissolved Oxygen (On Site)	APHA 2550 B APHA 4500 H*B APHA 4500 O G
Noise Level Measurement at Construction/Open Site	Noise Level	ISO 1996-1:2016 (E)
Vibration Level Measurement at Construction/Open Site	Vibration Level	In-House Method EC-VB-001, based on BS 5228: Part 1 (1997)
Air Quality Measurement/Ambient Air Monitoring/Indoor Air Quality Monitoring	Measurement of Carbon Dioxide (CO ₂) Measurement of Air Velocity in Ducting Measurement of Respirable Particulate/Particulate Less than 10 Micron Measurement of Ozone (O ₃) Concentration Measurement of Formaldehyde concentration. Measurement of Total Volatile Organic Compound (TVOC)	In-House Method EC-IAQ-01 (based on Manufacturer Measurement Procedure) – TSI TA465-P (Air Flow) and TSI 982 Probe In-House Method EC-IAQ-02 (based on Manufacturer Measurement Procedure) – TSI TA465-P (Air Flow) and TSI 966 probe In-House Method EC-IAQ-08 (based on Manufacturer Measurement Procedure) – TSI Dusttrak In-House Method EC-IAQ-04 (based on Manufacturer Measurement Procedure) – Aeroqual Ozone Meter & Sensor In-House method EC-IAQ-05 (based on manufacturer measurement procedure) – Formaldemeter™ htv-m In-house method EC-IAQ-06 (based on manufacturer measurement procedure) Mini RAE Lite PGM 7300
Air Emission – Flue Gas Monitoring		
NO _x	Determination of Nitrogen Oxides Emissions from Stationary Sources	In-House method IS 008 based on Gas Analyzer – Fuel Efficiency Monitor FEM-7 V1.3)

NO: SAMM 686

Page: 9 of 9

Signatories:

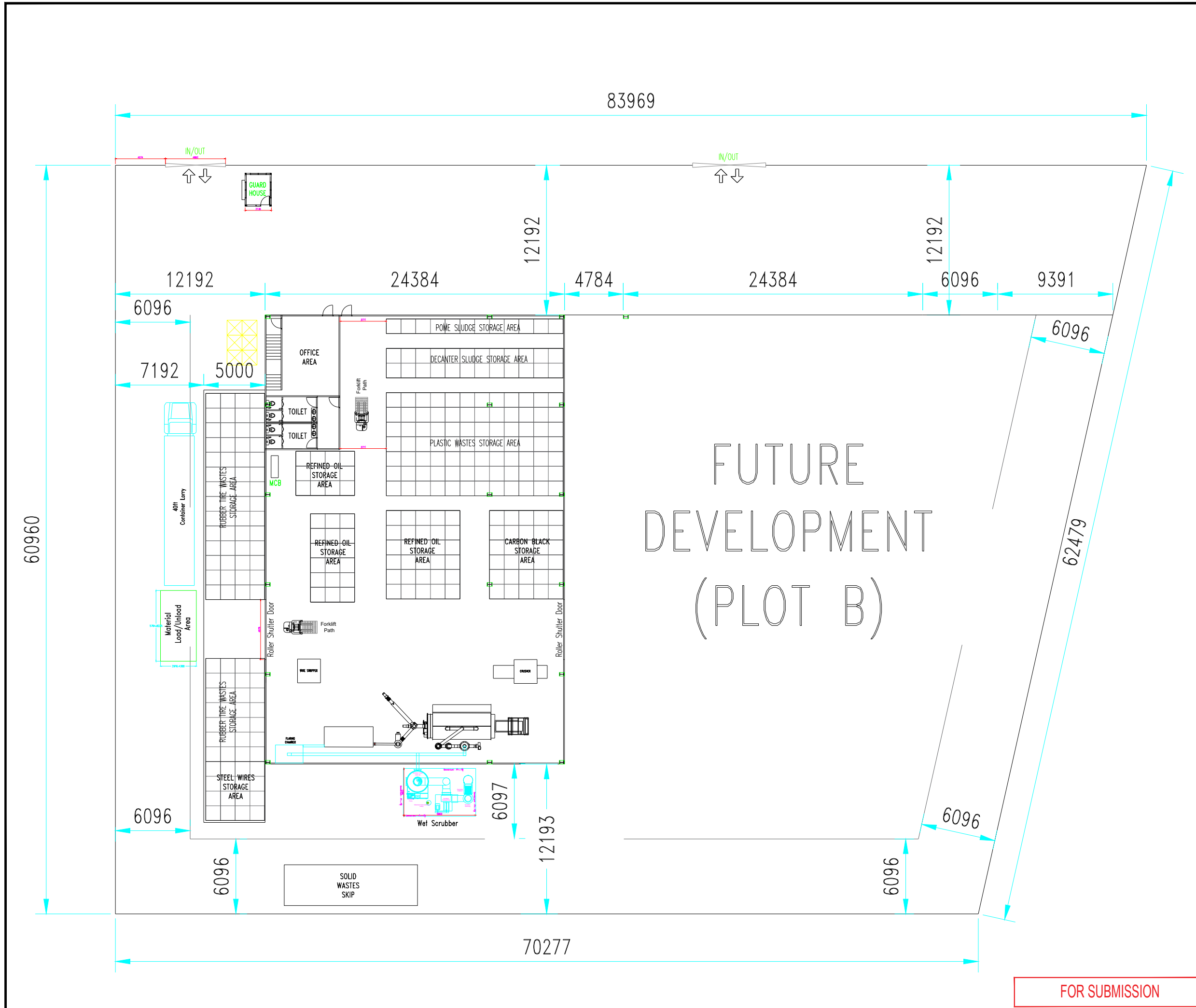
- | | | |
|----|----------------------------------|----------------------------|
| 1. | * Dr. Shanmugam A/L Suberamaniam | IKM No.: M/1095/2640/96/99 |
| 2. | Dr. Nagendran A/L Periaiah | IKM No.: M/3186/4722/05/11 |
| 3. | Saipul Bin Mohd Saleh | IKM No.: L/3191/9566/22 |

* Note: Non-resident Signatory

Scan this QR Code or visit www.ism.gov.my/cab-directories for the current scope of accreditation

APPENDIX 5.1

PROJECT LAYOUT



PROJECT TITLE:

PROPOSED RUBBER
TIRE WASTES AND
RELATED FEEDSTOCKS
FOR REFINED OIL
MANUFACTURING ON
PART OF LOT 225111
(PLOT A), JALAN
GOPENG, KAWASAN
PERINDUSTRIAN
TUNGZEN, MUKIM
SUNGAI RAYA, 31300
KAMPUNG KEPAYANG,
PERAK DARUL RIDZUAN

CLIENT :

P2 OIL SDN BHD

Lot 225111, Jalan Gopeng, Kawasan
Perindustrian Tungzen, Mukim Sungai
Raya, 31300 Kampung Kepayang,
Perak Darul Ridzuan.

ENVIRONMENTAL CONSULTANT :

GREEN EARTH CONSULTANCY SDN BHD
NO. 28, JALAN INDAH 1/4,
TAMAN UNIVERSITI INDAH,
43300 SERI KEMBANGAN,
SELANGOR DARUL EHSAN

EIA CONSULTANT :

PROFESSIONAL ENGINEER
WITH PRACTISING CERTIFICATE
CIVIL
CHOO HOW WEE
C115067
MALAYSIA

Rev	Date	Description	Desg	Check	Appr
00	21/02/2024	PLANT LAYOUT	HF	AC	CHW

Designed By : HF
Drawn By : HF
Checked By : AC
Approved By : CHW
CAD File No. : 1

Date : 21/02/2024
Drawing Title :
PROJECT LAYOUT PLAN
Drawing No. : POSB/AutoCAD/Layout
Rev 00

APPENDIX 6.1
CERTIFICATE OF ANALYSIS (WATER QUALITY)

RIVER WATER QUALITY MONITORING REPORT AUGUST 2023

PREPARED FOR:

P2 OIL SDN BHD

Project: Proposed Pyrolysis Plant at
Lot 225111, Jalan Gopeng,
Tungzen Industrial Park, Mukim Sungai Raya,
31300 Kampung Kepayang,
Perak Darul Ridzuan.

REPORT REF:

EC/0823/03594(1)

MONITORING DATE:

24th August 2023

REPORTING DATE:

9th September 2023

CUSTOMER : SUN SOON YIK SDN. BHD.

REPORT REF : RIVER WATER QUALITY MONITORING

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2.0 SCOPE OF MEASUREMENT	4
3.0 METHODOLOGY	5
4.0 MONITORING RESULTS	7
5.0 CONCLUSION	12
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1.0 **INTRODUCTION**

Kespro Consultants Sdn. Bhd. was engaged by by **P2 OIL SDN. BHD.**, to conduct River Water Quality Monitoring for 5 points on 24th August 2023 at: -

P2 OIL SDN. BHD.

Project: Proposed Pyrolysis Plant at Lot 225111, Jalan Gopeng, Tungzen Industrial Park, Mukim Sungai Raya, 31300 Kampung Kepayang, Perak Darul Ridzuan.

The aim of this monitoring is to conduct a survey of the water quality at the proposed points. Analysis was conducted according to parameters specified for Class IIB [National Water Quality Standards (NWQS)].

The River Water Quality Monitoring is based on the site operation and information given by the proponent or his representative(s) during the day(s) of monitoring/sampling. Therefore, we reasonably believe that the analysis data represents the greatest pollutant level in the industrial influent sampled during the exercise. Hence, it can be used as reference to assist the proponent to check environmental compliance's, as requested by Department of Environment (DOE) Malaysia.

CUSTOMER : P2 OIL SDN. BHD.

REPORT REF : RIVER WATER QUALITY MONITORING

Details of the monitoring are as follows: -

1.1 Date of Sampling

24th August 2023

1.2 Sampling Personnel

- | | |
|-------------------------------------|------------------|
| a) Mr. Mohd Zaibidi Bin Ramli | Field Technician |
| b) Mr. Muhammad Afiq Bin Mohd Zaidi | Field Technician |

1.3 Person in Charge at Site

- a) Mr. Abraham

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CUSTOMER : P2 OIL SDN. BHD.

REPORT REF : RIVER WATER QUALITY MONITORING

1.4 Site Description

Table 1.4: Details of Sampling

No.	Sample Marking	Description	Sampling Schedule		Coordinates	
			Date	Time	Latitude	Longitude
1.	W1	Upstream (External Drain - Before Project site)	24.08.2023	11.35 am	4°30'45.0"N	101°08'57.2"E
2.	W2	Downstream (External Drain - After Project site)		11.40 am	4°30'44.3"N	101°08'54.3"E
3.	W3	Downstream (Stormwater Drainage)		11.45 am	4°30'42.5"N	101°08'42.5"E
4.	W4	Downstream (Stormwater Drainage)		12.00 pm	4°31'01.0"N	101°08'17.4"E
5.	W5	Downstream (Sungai Raya)		12.15 pm	4°31'00.5"N	101°08'16.5"E

2.0 SCOPE OF MEASUREMENT

The water quality survey was carried out as follows:

1. Temperature
2. pH
3. Dissolved Oxygen
4. Chemical Oxygen Demand (COD)
5. Biochemical Oxygen Demand (BOD)
6. Total Suspended Solids
7. Turbidity
8. Mercury
9. Cadmium
10. Chromium Hexavalent
11. Arsenic
12. Lead
13. Chromium Trivalent
14. Copper
15. Manganese
16. Nickel
17. Tin
18. Zinc
19. Iron
20. Ammoniacal Nitrogen
21. Oil & Grease
22. Escherichia coli (E-coli)

3.0 METHODOLOGY

3.1 WATER QUALITY MONITORING

Samples were collected, preserved and analyzed according to Standard Methods for the Examination of Water & Wastewater, 21st Edition, 2005; American Public Health Association (APHA), American Water works Association (AWWA) & Water Environment Federation (WEF).

Table 3.1: Laboratory Test Parameter and Methodology

Test Parameter	Test Method
Temperature, °C	APHA 2550 B
pH	APHA 4500 H ⁺ B
Dissolved Oxygen, mg/l	APHA 4500 O-G
COD, mg/l	APHA 5220 C
BOD* 5 days @ 20°C, mg/l	APHA 5210 B
Total Suspended Solids, mg/l	APHA 2540 D
Turbidity, NTU	APHA 2130 B
Mercury (Hg), mg/l	APHA 3112 B (modified)
Cadmium (Cd), mg/l	APHA 3111 B
Chromium Hexavalent (Cr ⁶⁺), mg/l	APHA 3500 Cr B
Arsenic (As), mg/l	APHA 3114 B (modified)
Lead (Pb), mg/l	APHA 3111 B
Chromium Trivalent (Cr ³⁺), mg/l	In-House Method EC-SM-022, based on APHA 3111 B & APHA 3500 Cr B
Copper (Cu), mg/l	APHA 3111 B
Manganese (Mn), mg/l	APHA 3111 B
Nickel (Ni), mg/l	APHA 3111 B

CUSTOMER : P2 OIL SDN. BHD.

REPORT REF : RIVER WATER QUALITY MONITORING

Table 3.1: Laboratory Test Parameter and Methodology (Cont.)

Test Parameter	Test Method
Tin (Sn), mg/l	In-House Method EC-SM-011, based on APHA 3114 B
Zinc (Zn), mg/l	APHA 3111 B
Iron (Fe), mg/l	APHA 3111 B
Ammoniacal Nitrogen, mg/l	APHA 4500 NH ₃ - B,F
Oil & Grease, mg/l	APHA 5520 B
E-coli, CFU/100ml	APHA 9222 G

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4.0 MONITORING RESULTSTable 4.1: Laboratory Analysis Results for Water sampled at point **W1**.

TEST PARAMETER	RESULTS	CLASS IIB (NWQS)
	W1 - UPSTREAM (EXTERNAL DRAIN - BEFORE PROJECT SITE)	
Temperature, °C	29.6°C	-
pH	8.47	6.0-9.0
Dissolved Oxygen, mg/l	5.5	5-7
COD, mg/l	16	25
BOD* 5 days @ 20°C, mg/l	8	3
Total Suspended Solids, mg/l	6	50
Turbidity, NTU	2.52	50
Mercury (Hg), mg/l	ND(<0.0002)	0.001
Cadmium (Cd), mg/l	ND(<0.002)	0.01
Chromium Hexavalent (Cr ⁶⁺), mg/l	ND(<0.02)	0.05
Arsenic (As), mg/l	0.03	0.05
Lead (Pb), mg/l	ND(<0.01)	0.05
Chromium Trivalent (Cr ³⁺), mg/l	ND(<0.02)	-
Copper (Cu), mg/l	ND(<0.01)	0.02
Manganese (Mn), mg/l	0.07	0.1
Nickel (Ni), mg/l	0.01	0.05
Tin (Sn), mg/l	0.005	-
Zinc (Zn), mg/l	ND(<0.01)	5
Iron (Fe), mg/l	0.06	1
Ammoniacal Nitrogen, mg/l	ND(<0.01)	0.3
Oil & Grease, mg/l	ND(<0.01)	0.04; N
E-coli, CFU/100ml	8	-

Table 4.2: Laboratory Analysis Results for Water sampled at point **W2**.

TEST PARAMETER	RESULTS	CLASS IIB (NWQS)
	W2 – DOWNSTREAM (EXTERNAL DRAIN - AFTER PROJECT SITE)	
Temperature, °C	29.6°C	-
pH	8.20	6.0-9.0
Dissolved Oxygen, mg/l	5.7	5-7
COD, mg/l	16	25
BOD* 5 days @ 20°C, mg/l	7	3
Total Suspended Solids, mg/l	8	50
Turbidity, NTU	2.67	50
Mercury (Hg), mg/l	ND(<0.0002)	0.001
Cadmium (Cd), mg/l	ND(<0.002)	0.01
Chromium Hexavalent (Cr ⁶⁺), mg/l	ND(<0.02)	0.05
Arsenic (As), mg/l	0.04	0.05
Lead (Pb), mg/l	ND(<0.01)	0.05
Chromium Trivalent (Cr ³⁺), mg/l	ND(<0.02)	-
Copper (Cu), mg/l	ND(<0.01)	0.02
Manganese (Mn), mg/l	0.06	0.1
Nickel (Ni), mg/l	0.01	0.05
Tin (Sn), mg/l	0.006	-
Zinc (Zn), mg/l	0.01	5
Iron (Fe), mg/l	0.14	1
Ammoniacal Nitrogen, mg/l	ND(<0.01)	0.3
Oil & Grease, mg/l	ND(<0.01)	0.04; N
E-coli, CFU/100ml	11	-

Table 4.3: Laboratory Analysis Results for Water sampled at point **W3**.

TEST PARAMETER	RESULTS	CLASS IIB (NWQS)
	W3 – DOWNSTREAM (STORMWATER DRAINAGE)	
Temperature, °C	29.7°C	-
pH	7.45	6.0-9.0
Dissolved Oxygen, mg/l	2.9	5-7
COD, mg/l	37	25
BOD* 5 days @ 20°C, mg/l	15	3
Total Suspended Solids, mg/l	44	50
Turbidity, NTU	27.1	50
Mercury (Hg), mg/l	ND(<0.0002)	0.001
Cadmium (Cd), mg/l	ND(<0.002)	0.01
Chromium Hexavalent (Cr ⁶⁺), mg/l	ND(<0.02)	0.05
Arsenic (As), mg/l	0.03	0.05
Lead (Pb), mg/l	0.04	0.05
Chromium Trivalent (Cr ³⁺), mg/l	ND(<0.02)	-
Copper (Cu), mg/l	ND(<0.01)	0.02
Manganese (Mn), mg/l	0.06	0.1
Nickel (Ni), mg/l	0.04	0.05
Tin (Sn), mg/l	0.01	-
Zinc (Zn), mg/l	0.23	5
Iron (Fe), mg/l	0.62	1
Ammoniacal Nitrogen, mg/l	ND(<0.01)	0.3
Oil & Grease, mg/l	ND(<0.01)	0.04; N
E-coli, CFU/100ml	20	-

Table 4.4: Laboratory Analysis Results for Water sampled at point **W4**.

TEST PARAMETER	RESULTS	CLASS IIB (NWQS)
	W4 – DOWNSTREAM (STORMWATER DRAINAGE)	
Temperature, °C	29.7°C	-
pH	8.19	6.0-9.0
Dissolved Oxygen, mg/l	5.2	5-7
COD, mg/l	22	25
BOD* 5 days @ 20°C, mg/l	10	3
Total Suspended Solids, mg/l	42	50
Turbidity, NTU	20.3	50
Mercury (Hg), mg/l	ND(<0.0002)	0.001
Cadmium (Cd), mg/l	ND(<0.002)	0.01
Chromium Hexavalent (Cr ⁶⁺), mg/l	ND(<0.02)	0.05
Arsenic (As), mg/l	0.03	0.05
Lead (Pb), mg/l	0.02	0.05
Chromium Trivalent (Cr ³⁺), mg/l	ND(<0.02)	-
Copper (Cu), mg/l	ND(<0.01)	0.02
Manganese (Mn), mg/l	0.05	0.1
Nickel (Ni), mg/l	0.02	0.05
Tin (Sn), mg/l	0.01	-
Zinc (Zn), mg/l	0.20	5
Iron (Fe), mg/l	0.73	1
Ammoniacal Nitrogen, mg/l	ND(<0.01)	0.3
Oil & Grease, mg/l	ND(<0.01)	0.04; N
E-coli, CFU/100ml	9	-

Table 4.5: Laboratory Analysis Results for Water sampled at point **W5**.

TEST PARAMETER	RESULTS	CLASS IIB (NWQS)
	W5 – DOWNSTREAM (Sungai Raya)	
Temperature, °C	29.7°C	-
pH	8.19	6.0-9.0
Dissolved Oxygen, mg/l	5.5	5-7
COD, mg/l	19	25
BOD* 5 days @ 20°C, mg/l	9	3
Total Suspended Solids, mg/l	48	50
Turbidity, NTU	29.3	50
Mercury (Hg), mg/l	ND(<0.0002)	0.001
Cadmium (Cd), mg/l	ND(<0.002)	0.01
Chromium Hexavalent (Cr ⁶⁺), mg/l	ND(<0.02)	0.05
Arsenic (As), mg/l	0.03	0.05
Lead (Pb), mg/l	0.01	0.05
Chromium Trivalent (Cr ³⁺), mg/l	ND(<0.02)	-
Copper (Cu), mg/l	ND(<0.01)	0.02
Manganese (Mn), mg/l	0.08	0.1
Nickel (Ni), mg/l	0.03	0.05
Tin (Sn), mg/l	0.01	-
Zinc (Zn), mg/l	0.06	5
Iron (Fe), mg/l	0.85	1
Ammoniacal Nitrogen, mg/l	ND(<0.01)	0.3
Oil & Grease, mg/l	ND(<0.01)	0.04; N
E-coli, CFU/100ml	14	-

a) NWQS means National Water Quality Standard

b) ND means Not Detected

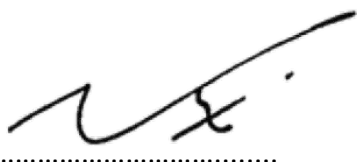
c) N means free from visible film sheen, discoloration and deposits

5.0 CONCLUSION

Generally, the water sampled at **P2 OIL SDN. BHD.**, were below the limit parameter specified for Class IIB, [National Water Quality Standard (NWQS) for Malaysia]. However, certain parameter **exceeded** than its standard limits as listed in table below:

TEST PARAMETER	RESULT					CLASS IIB (NWQS)	UNIT
	W1	W2	W3	W4	W5		
DO	-	-	2.9	-	-	5-7	mg/L
COD	-	-	37	-	-	25	mg/L
BOD	8	7	15	10	9	3	mg/L

Sampling and Analysis Verified by,



.....
Ts. ChM. Dr. Nagendran Periaiah

B. Sc. (Hons) Ind. Chem. (UTM),

M. Tech (Env. Mgmt.) (UM),

DBA (Env. Mgmt.) (IIUM),

Director/Chemist

MMIC [M/3186/4722/05/11]

CUSTOMER : P2 OIL SDN. BHD.

REPORT REF : RIVER WATER QUALITY MONITORING

APPENDIX

CERTIFICATE OF ACCREDITATION – SAMM 686

S/N: 0634



STANDARDS
MALAYSIA

Certificate of Accreditation

No: SAMM 686

Accredited since: 23 December 2014

This is to certify that

ENVICHEM CONSULTS SDN. BHD.
KLANG, SELANGOR
MALAYSIA



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for the current scope of accreditation

has been granted accreditation in respect of the scope of accreditation described in the schedule, subject to the terms and conditions governing the *Skim Akreditasi Makmal Malaysia* (SAMM), the Laboratory Accreditation Scheme of Malaysia.

Laboratories accredited under SAMM meet the requirements of MS ISO/IEC 17025. This Malaysian Standard is identical with ISO/IEC 17025 published by the International Organization for Standardization (ISO).



(DATUK FADILAH BAHARIN)
Director General
Department of Standards Malaysia

Date of issue: 17 November 2017



Envichem



RE65/JA/1676
Certified ISO 14001



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CERTIFICATE OF ANALYSIS

Page 1 of 1

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Customer	P2 OIL SDN. BHD.
Lab Report No.	LP/0823/8215(1)
Date Sample Received	25.08.2023
Date Sample Reported	06.09.2023
Sample Description	River/Solution
Sample Marking	W1 – Upstream (External Drain-Before Project site) sample collected on 24.08.2023-11.35 am)

TEST PARAMETER	METHODS	RESULTS	CLASS IIB NATIONAL WATER QUALITY STANDARD (NWQS)
Temperature, °C	APHA 2550 B	29.6°C	-
pH	APHA 4500 H ⁺ B	8.47	6.0-9.0
Dissolved Oxygen, mg/l	APHA 4500 O-G	5.5	5-7
COD, mg/l	APHA 5220 C	16	25
BOD* 5 days @ 20°C, mg/l	APHA 5210 B	8	3
Total Suspended Solids, mg/l	APHA 2540 D	6	50
Turbidity, NTU	APHA 2130 B	2.52	-
Mercury (Hg), mg/l	APHA 3112 B (modified)	ND(<0.0002)	0.001
Cadmium (Cd), mg/l	APHA 3111 B	ND(<0.002)	0.01
Chromium Hexavalent (Cr ⁶⁺), mg/l	APHA 3500 Cr B	ND(<0.02)	0.05
Arsenic (As), mg/l	APHA 3114 B (modified)	0.03	0.05
Lead (Pb), mg/l	APHA 3111 B	ND(<0.01)	0.05
^Chromium Trivalent (Cr ³⁺), mg/l	In-House Method EC-SM-022, based on APHA 3111 B & APHA 3500 Cr B	ND(<0.02)	-
Copper (Cu), mg/l	APHA 3111 B	ND(<0.01)	0.02
Manganese (Mn), mg/l	APHA 3111 B	0.07	0.1
Nickel (Ni), mg/l	APHA 3111 B	0.01	0.05
Tin (Sn), mg/l	In-House Method EC-SM-011, based on APHA 3114 B	0.005	-
Zinc (Zn), mg/l	APHA 3111 B	ND(<0.01)	5
Iron (Fe), mg/l	APHA 3111 B	0.06	1
Ammoniacal Nitrogen, mg/l	APHA 4500 NH ₃ - B,F	ND(<0.01)	0.3
Oil & Grease, mg/l	APHA 5520 B	ND(<0.01)	0.04; N
^E-coli, CFU/100ml	APHA 9222 G	8	-

Note: 1) ND means Not Detected
2) APHA means Standard Method for the Examination of Water and Wastewater (American Public Health Association), 21st Edition 2005
3) * means sample for BOD was tested on 25.08.2023 & 30.08.2023
4) ^ means Not Accredited
5) N means free from visible film sheen, discolouration and deposits

To:
KESPRO CONSULTANTS SDN. BHD.

For:
P2 OIL SDN. BHD.

Project: Proposed Pyrolysis Plant at
Lot 225111, Jalan Gopeng, Tungzen Industrial Park,
Mukim Sungai Raya, 31300 Kampung Kepayang,
Perak Darul Ridzuan.

Verified By,

Ts. ChM. Dr. Nagendran Periaiah
B. Sc. (Hons) Ind. Chem. (UTM),
M. Tech (Env. Mgmt.) (UM),
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Director/Chemist
MMIC Reg. No.: M/3186/4722/05/11

The above results relate only to the items tested. This report shall not be reproduced except in full without the written approval of Envichem Consults Sdn. Bhd.



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Page 1 of 1

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Customer	P2 OIL SDN. BHD.
Lab Report No.	LP/0823/8215(2)
Date Sample Received	25.08.2023
Date Sample Reported	06.09.2023
Sample Description	River/Solution
Sample Marking	W2 – Downstream (External Drain-After Project site) sample collected on 24.08.2023-11.40 am

TEST PARAMETER	METHODS	RESULTS	CLASS IIB NATIONAL WATER QUALITY STANDARD (NWQS)
Temperature, °C	APHA 2550 B	29.6°C	-
pH	APHA 4500 H ⁺ B	8.20	6.0-9.0
Dissolved Oxygen, mg/l	APHA 4500 O-G	5.7	5-7
COD, mg/l	APHA 5220 C	16	25
BOD* 5 days @ 20°C, mg/l	APHA 5210 B	7	3
Total Suspended Solids, mg/l	APHA 2540 D	8	50
Turbidity, NTU	APHA 2130 B	2.67	-
Mercury (Hg), mg/l	APHA 3112 B (modified)	ND(<0.0002)	0.001
Cadmium (Cd), mg/l	APHA 3111 B	ND(<0.002)	0.01
Chromium Hexavalent (Cr ⁶⁺), mg/l	APHA 3500 Cr B	ND(<0.02)	0.05
Arsenic (As), mg/l	APHA 3114 B (modified)	0.04	0.05
Lead (Pb), mg/l	APHA 3111 B	ND(<0.01)	0.05
^Chromium Trivalent (Cr ³⁺), mg/l	In-House Method EC-SM-022, based on APHA 3111 B & APHA 3500 Cr B	ND(<0.02)	-
Copper (Cu), mg/l	APHA 3111 B	ND(<0.01)	0.02
Manganese (Mn), mg/l	APHA 3111 B	0.06	0.1
Nickel (Ni), mg/l	APHA 3111 B	0.01	0.05
Tin (Sn), mg/l	In-House Method EC-SM-011, based on APHA 3114 B	0.006	-
Zinc (Zn), mg/l	APHA 3111 B	0.01	5
Iron (Fe), mg/l	APHA 3111 B	0.14	1
Ammoniacal Nitrogen, mg/l	APHA 4500 NH ₃ - B,F	ND(<0.01)	0.3
Oil & Grease, mg/l	APHA 5520 B	ND(<0.01)	0.04; N
^E-coli, CFU/100ml	APHA 9222 G	11	-

Note: 1) ND means Not Detected
2) APHA means Standard Method for the Examination of Water and Wastewater (American Public Health Association), 21st Edition 2005
3) * means sample for BOD was tested on 25.08.2023 & 30.08.2023
4) ^ means Not Accredited
5) N means free from visible film sheen, discolouration and deposits

To:
KESPRO CONSULTANTS SDN. BHD.

For:
P2 OIL SDN. BHD.

Project: Proposed Pyrolysis Plant at
Lot 225111, Jalan Gopeng, Tungzen Industrial Park,
Mukim Sungai Raya, 31300 Kampung Kepayang,
Perak Darul Ridzuan.

Verified By,

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M. Tech (Env. Mgmt.) (UM),
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Director/Chemist
MMIC Reg. No.: M/3186/4722/05/11

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Customer	P2 OIL SDN. BHD.
Lab Report No.	LP/0823/8215(3)
Date Sample Received	25.08.2023
Date Sample Reported	06.09.2023
Sample Description	River/Solution
Sample Marking	W3 – Downstream (Stormwater Drainage) sample collected on 24.08.2023- 11.45 am

TEST PARAMETER	METHODS	RESULTS	CLASS IIB NATIONAL WATER QUALITY STANDARD (NWQS)
Temperature, °C	APHA 2550 B	29.7°C	-
pH	APHA 4500 H ⁺ B	7.45	6.0-9.0
Dissolved Oxygen, mg/l	APHA 4500 O-G	2.9	5-7
COD, mg/l	APHA 5220 C	37	25
BOD* 5 days @ 20°C, mg/l	APHA 5210 B	15	3
Total Suspended Solids, mg/l	APHA 2540 D	44	50
Turbidity, NTU	APHA 2130 B	27.1	-
Mercury (Hg), mg/l	APHA 3112 B (modified)	ND(<0.0002)	0.001
Cadmium (Cd), mg/l	APHA 3111 B	ND(<0.002)	0.01
Chromium Hexavalent (Cr ⁶⁺), mg/l	APHA 3500 Cr B	ND(<0.02)	0.05
Arsenic (As), mg/l	APHA 3114 B (modified)	0.03	0.05
Lead (Pb), mg/l	APHA 3111 B	0.04	0.05
^Chromium Trivalent (Cr ³⁺), mg/l	In-House Method EC-SM-022, based on APHA 3111 B & APHA 3500 Cr B	ND(<0.02)	-
Copper (Cu), mg/l	APHA 3111 B	ND(<0.01)	0.02
Manganese (Mn), mg/l	APHA 3111 B	0.06	0.1
Nickel (Ni), mg/l	APHA 3111 B	0.04	0.05
Tin (Sn), mg/l	In-House Method EC-SM-011, based on APHA 3114 B	0.01	-
Zinc (Zn), mg/l	APHA 3111 B	0.23	5
Iron (Fe), mg/l	APHA 3111 B	0.62	1
Ammoniacal Nitrogen, mg/l	APHA 4500 NH ₃ - B,F	ND(<0.01)	0.3
Oil & Grease, mg/l	APHA 5520 B	ND(<0.01)	0.04; N
^E-coli, CFU/100ml	APHA 9222 G	20	-

Note: 1) ND means Not Detected
2) APHA means Standard Method for the Examination of Water and Wastewater (American Public Health Association), 21st Edition 2005
3) * means sample for BOD was tested on 25.08.2023 & 30.08.2023
4) ^ means Not Accredited
5) N means free from visible film sheen, discolouration and deposits

To:
KESPRO CONSULTANTS SDN. BHD.

For:
P2 OIL SDN. BHD.

Project: Proposed Pyrolysis Plant at
Lot 225111, Jalan Gopeng, Tungzen Industrial Park,
Mukim Sungai Raya, 31300 Kampung Kepayang,
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Customer	P2 OIL SDN. BHD.
Lab Report No.	LP/0823/8215(4)
Date Sample Received	25.08.2023
Date Sample Reported	06.09.2023
Sample Description	River/Solution
Sample Marking	W4 – Downstream (Stormwater Drainage) sample collected on 24.08.2023- 12.00 pm

TEST PARAMETER	METHODS	RESULTS	CLASS IIB NATIONAL WATER QUALITY STANDARD (NWQS)
Temperature, °C	APHA 2550 B	29.7°C	-
pH	APHA 4500 H ⁺ B	8.19	6.0-9.0
Dissolved Oxygen, mg/l	APHA 4500 O-G	5.2	5-7
COD, mg/l	APHA 5220 C	22	25
BOD* 5 days @ 20°C, mg/l	APHA 5210 B	10	3
Total Suspended Solids, mg/l	APHA 2540 D	42	50
Turbidity, NTU	APHA 2130 B	20.3	-
Mercury (Hg), mg/l	APHA 3112 B (modified)	ND(<0.0002)	0.001
Cadmium (Cd), mg/l	APHA 3111 B	ND(<0.002)	0.01
Chromium Hexavalent (Cr ⁶⁺), mg/l	APHA 3500 Cr B	ND(<0.02)	0.05
Arsenic (As), mg/l	APHA 3114 B (modified)	0.03	0.05
Lead (Pb), mg/l	APHA 3111 B	0.02	0.05
^Chromium Trivalent (Cr ³⁺), mg/l	In-House Method EC-SM-022, based on APHA 3111 B & APHA 3500 Cr B	ND(<0.02)	-
Copper (Cu), mg/l	APHA 3111 B	ND(<0.01)	0.02
Manganese (Mn), mg/l	APHA 3111 B	0.05	0.1
Nickel (Ni), mg/l	APHA 3111 B	0.02	0.05
Tin (Sn), mg/l	In-House Method EC-SM-011, based on APHA 3114 B	0.01	-
Zinc (Zn), mg/l	APHA 3111 B	0.20	5
Iron (Fe), mg/l	APHA 3111 B	0.73	1
Ammoniacal Nitrogen, mg/l	APHA 4500 NH ₃ - B,F	ND(<0.01)	0.3
Oil & Grease, mg/l	APHA 5520 B	ND(<0.01)	0.04; N
^E-coli, CFU/100ml	APHA 9222 G	9	-

Note: 1) ND means Not Detected
2) APHA means Standard Method for the Examination of Water and Wastewater (American Public Health Association), 21st Edition 2005
3) * means sample for BOD was tested on 25.08.2023 & 30.08.2023
4) ^ means Not Accredited
5) N means free from visible film sheen, discolouration and deposits

To:
KESPRO CONSULTANTS SDN. BHD.

For:
P2 OIL SDN. BHD.

Project: Proposed Pyrolysis Plant at
Lot 225111, Jalan Gopeng, Tungzen Industrial Park,
Mukim Sungai Raya, 31300 Kampung Kepayang,
Perak Darul Ridzuan.

Verified By,

[Signature]
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Customer	P2 OIL SDN. BHD.
Lab Report No.	LP/0823/8215(5)
Date Sample Received	25.08.2023
Date Sample Reported	06.09.2023
Sample Description	River/Solution
Sample Marking	W5 – Downstream (Sungai Raya) sample collected on 24.08.2023- 12.15 pm

TEST PARAMETER	METHODS	RESULTS	CLASS IIB NATIONAL WATER QUALITY STANDARD (NWQS)
Temperature, °C	APHA 2550 B	29.7°C	-
pH	APHA 4500 H ⁺ B	8.19	6.0-9.0
Dissolved Oxygen, mg/l	APHA 4500 O-G	5.5	5-7
COD, mg/l	APHA 5220 C	19	25
BOD* 5 days @ 20°C, mg/l	APHA 5210 B	9	3
Total Suspended Solids, mg/l	APHA 2540 D	48	50
Turbidity, NTU	APHA 2130 B	29.3	-
Mercury (Hg), mg/l	APHA 3112 B (modified)	ND(<0.0002)	0.001
Cadmium (Cd), mg/l	APHA 3111 B	ND(<0.002)	0.01
Chromium Hexavalent (Cr ⁶⁺), mg/l	APHA 3500 Cr B	ND(<0.02)	0.05
Arsenic (As), mg/l	APHA 3114 B (modified)	0.03	0.05
Lead (Pb), mg/l	APHA 3111 B	0.01	0.05
^Chromium Trivalent (Cr ³⁺), mg/l	In-House Method EC-SM-022, based on APHA 3111 B & APHA 3500 Cr B	ND(<0.02)	-
Copper (Cu), mg/l	APHA 3111 B	ND(<0.01)	0.02
Manganese (Mn), mg/l	APHA 3111 B	0.08	0.1
Nickel (Ni), mg/l	APHA 3111 B	0.03	0.05
Tin (Sn), mg/l	In-House Method EC-SM-011, based on APHA 3114 B	0.01	-
Zinc (Zn), mg/l	APHA 3111 B	0.06	5
Iron (Fe), mg/l	APHA 3111 B	0.85	1
Ammoniacal Nitrogen, mg/l	APHA 4500 NH ₃ - B,F	ND(<0.01)	0.3
Oil & Grease, mg/l	APHA 5520 B	ND(<0.01)	0.04; N
^E-coli, CFU/100ml	APHA 9222 G	14	-

Note: 1) ND means Not Detected
2) APHA means Standard Method for the Examination of Water and Wastewater (American Public Health Association), 21st Edition 2005
3) * means sample for BOD was tested on 25.08.2023 & 30.08.2023
4) ^ means Not Accredited
5) N means free from visible film sheen, discolouration and deposits

To:
KESPRO CONSULTANTS SDN. BHD.

For:
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Project: Proposed Pyrolysis Plant at
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MONITORING PHOTOGRAPHS

RIVER WATER QUALITY MONITORING



Figure 1: W1 – Upstream (External Drain - Before Project site)



Figure 2: W2 – Downstream (External Drain - After Project site)



Figure 3: W3 – Downstream (Stormwater Drainage)



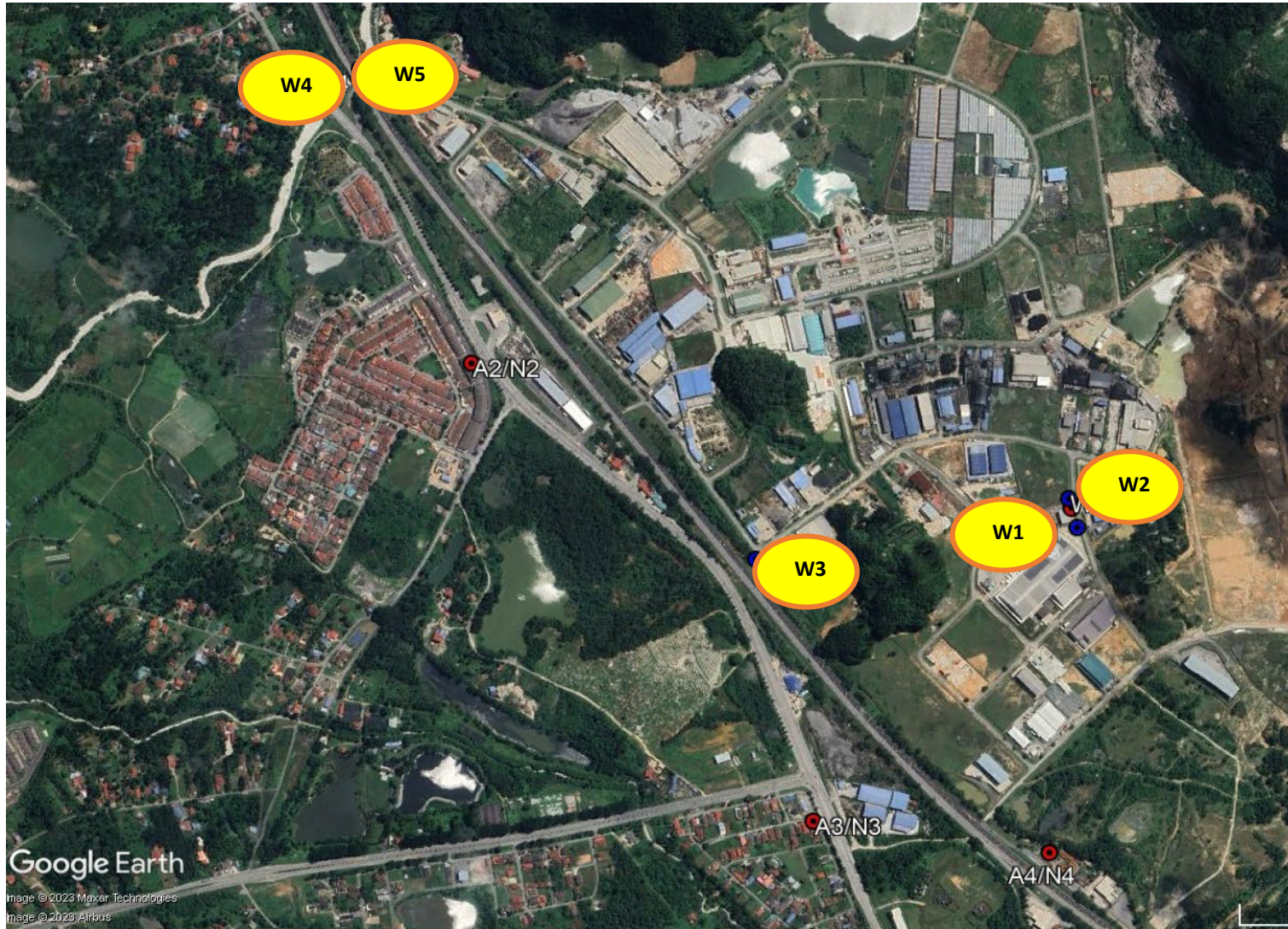
Figure 4: W4 – Downstream (Stormwater Drainage)



Figure 5: W5 – Downstream (Sungai Raya)

P2 OIL SDN. BHD.

**RIVER WATER QUALITY MONITORING –
LAYOUT PLAN**



Site Description: -

W1: Upstream (External Drain - Before
Project site)

W2: Downstream (External Drain - After
Project site)

W3: Downstream (Stormwater Drainage)

W4: Downstream (Stormwater Drainage)

W5: Downstream (Sungai Raya)

Prepared by:

KESPRO CONSULTANTS SDN. BHD.

Prepared for:

P2 OIL SDN BHD

APPENDIX 6.2
CERTIFICATE OF ANALYSIS (AIR QUALITY)

AMBIENT AIR QUALITY MONITORING REPORT AUGUST 2023

PREPARED FOR:

P2 OIL SDN. BHD.

Project: Proposed Pyrolysis Plant at Lot 225111, Jalan Gopeng,
Tungzen Industrial park, Mukim Sungai Raya, 31300 Kampung
Kepayang, Perak Darul Ridzuan, Malaysia.

REPORT REF:

EC/0823/03570(2)

MONITORING DATE:

24th – 25th August 2023

REPORTING DATE:

8th September 2023

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2.0 METHODOLOGY	3
3.0 MONITORING RESULTS	8
4.0 CONCLUSION	13
APPENDIX	

1.0 **INTRODUCTION**

Kespro Consultants Sdn. Bhd. was engaged by **P2 Oil Sdn. Bhd.**, to conduct Ambient Air Quality Monitoring on 24th – 25th August 2023 located at: -

P2 OIL SDN. BHD.

Project: Proposed Pyrolysis Plant at Lot 225111, Jalan Gopeng, Tungzen Industrial park, Mukim Sungai Raya, 31300 Kampung Kepayang, Perak Darul Ridzuan, Malaysia.

The objective of this monitoring was to determine the ambient air characteristics surrounding the factory in order to comply with Malaysia Ambient Air Quality Standard (2020).

The parameter monitored in this study was: -

- Particulate Matter <10 Micron (PM₁₀)
- Particulate Matter <2.5 Micron (PM_{2.5})
- Sulfur Dioxide, SO₂
- Nitrogen Dioxide, NO₂
- Carbon Monoxide, CO
- Ozone, O₃
- Volatile Organic Compound (VOC)

The monitoring was carried out for duration of 24 hours.

CUSTOMER : P2 OIL SDN. BHD.

REPORT REF : AMBIENT AIR QUALITY MONITORING

Details of the monitoring are as follows: -

1.1 Date of Sampling

24th – 25th August 2023

1.2 Sampling Personnel

- | | |
|-------------------------------------|------------------|
| a) Mr. Mohd Zaibidi Bin Ramli | Field Technician |
| b) Mr. Muhammad Afiq Bin Mohd Zaidi | Field Technician |

1.3 Person in Charge at Site

- a) Mr. Abraham

1.4 Site Description

Point ID	Location	Monitoring Date & Time		Coordinate
		Start	End	
A1	Project Boundary	24 th August 2023 10.15 am	25 th August 2023 10.15 am	4°30'44.4"N 101°08'54.6"E
A2	Nearest Shophouse at Taman Seri Raia	24 th August 2023 8.50 am	25 th August 2023 8.50 am	4°30'38.6"N 101°08'24.7"E
A3	Nearest House at Kg Tekkah	24 th August 2023 9.20 am	25 th August 2023 9.20 am	4°30'05.6"N 101°08'48.6"E
A4	Entrance at Ausiasia Nutriculture (Agro Based Industry)	24 th August 2023 10.30 am	25 th August 2023 10.30 am	4°30'53.3"N 101°09'04.0"E

2.0 METHODOLOGY

2.1 AMBIENT AIR QUALITY

2.1.1 RELATIVE HUMIDITY AND TEMPERATURE

Environmental air temperature and relative humidity measurements were performed using the following equipment.

Equipment	Model/Brand	Serial Number	Calibration Date	Calibration Due Date
Hot Wire Anemometer	9565-P-NB	9565P2029026	05/09/2022	05/09/2023
	966	P15070069	15/09/2022	15/09/2023

2.1.2 AMBIENT AIR MONITORING

Ambient air monitoring was carried out using the Low Flow Air Sampler as per: -

Parameter Monitored	Methodology
Particulate Matter <10 Micron (PM ₁₀)	USEPA 40 Part 50, Appendix J – The Determination of Particulate Matters in the Atmosphere
Particulate Matter <2.5 Micron (PM _{2.5})	USEPA 40 Part 50, Appendix L – The Determination of Particulate Matters in the Atmosphere
Sulfur Dioxide, SO ₂	ISC 704 A – Determination of SO ₂ content of the Atmosphere
Nitrogen Dioxide, NO ₂	ISC 408 – Analysis for Atmospheric NO ₂
Carbon Monoxide, CO	EC-IAQ-01 – Determination of CO in the atmosphere
Ozone, O ₃	EC-IAQ-04 – Determination of O ₃ in the atmosphere
Volatile Organic Compound, VOC	NIOSH 2549 – Measurement of VOC were performed using air sampling pump Mass Flowmeter

Note:-

- 1) USEPA means United States Environmental Protection Agency
- 2) ISC means Intersociety Committee

Equipment	Model/Brand	Serial Number	Calibration Date	Calibration Due Date
Low Flow Air Sampler	Polltech/LFAS	0222	02/06/2023	01/06/2024
		1919	28/09/2022	29/09/2023
		2019	29/09/2022	28/09/2023

An air sampler, specially designed sampling inlet which separate larger particles 10μ (50 percent cut point) and allows smaller particles 2.5μ to enter an internal particle size separator by WINS (Well Impactor Ninety-Six) where the suspended particulate matter in the $PM_{2.5}$ collected through a 47 mm PTFE filter over during a 24-hr sampling period.

The instrument can be used for PM_{10} and $PM_{2.5}$ by using WINS impactor. The measured concentration of particulate matter having an aerodynamic diameter less than or equal to a nominal 10μ or 2.5μ .

The filter is weighed (after moisture equilibration) before and after use to determine the net weight (mass) gain. The total volume of air sampled, corrected to EPA standard conditions (25°C , 760 mm Hg [101 kPa]), is determined from the measured flow rate and the sampling time.

The total volume of the sampled air is automatically computed by the sampler from the measures sampling flow rate over the actual run sampling time. The mass concentration of $PM_{2.5}$ and PM_{10} particles in the ambient air is computed as the mass of collected particles divided by the total volume of air sampled, corrected to standard conditions, and is expressed in micrograms per standard cubic meter ($\mu\text{g}/\text{std m}^3$).

For samples collected at temperatures and pressures significantly different than standard conditions, these corrected concentrations may differ substantially from actual concentrations (micrograms per actual cubic meter), particularly at high elevations. The actual particulate matter concentration can be calculated from the corrected concentration using the actual temperature and pressure during the sampling period.

CUSTOMER : P2 OIL SDN. BHD.

REPORT REF : AMBIENT AIR QUALITY MONITORING

Figure 1: Low Flow Air Sampler



CUSTOMER : P2 OIL SDN. BHD.

REPORT REF : AMBIENT AIR QUALITY MONITORING

Sulfur Dioxide and Nitrogen Dioxide sampling were performed using the following equipment: -

Equipment : Mass Flowmeter
Model : TSI 4146
Serial Number : 41461733023

Carbon Monoxide and Ozone were measured using the following portable direct reading equipment: -

Equipment : Air Quality Monitor
Brand : KD engineering Inc
Model : KD Air Box
Serial Num. : 7B010

Equipment : Ozone Monitor
Brand : Environmental Sensor Co.
Model : Z-1200
Serial Num. : 1334

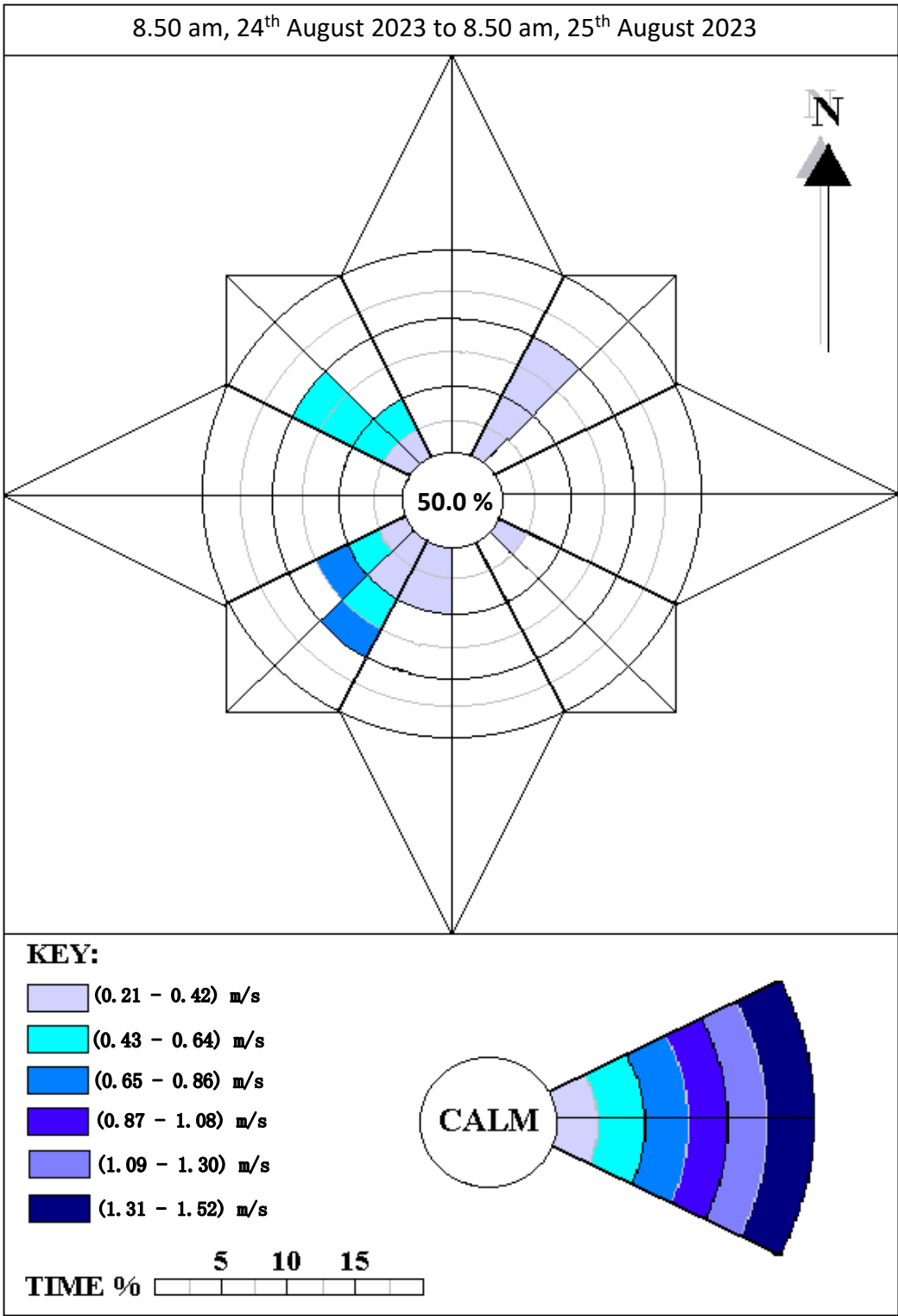
Sample preservation method, measurement and analytical according to standard practices by accredited laboratory as approved by DOE.

3.0 MONITORING RESULTS**3.1 ENVIRONMENTAL FACTORS DURING MONITORING**

a) Site Temperature and Relative Humidity recorded on 24th – 25th August 2023.

Sampling time	Site Temperature (Deg. C)	Relative Humidity (%)
8.50 am	26.5	91.8
10.50 am	27.4	87.2
12.50 pm	28.9	88.9
2.50 pm	31.1	64.1
4.50 pm	29.6	77.2
6.50 pm	28.0	80.1
8.50 pm	28.3	81.0
10.50 pm	27.2	88.5
12.50 am	25.8	93.8
2.50 am	26.0	92.1
4.50 am	24.7	93.3
6.50 am	24.9	93.5
8.50 am	24.6	96.8

FIGURE 2: WIND ROSE SUMMARY DURING MONITORING: 24 HOURS



3.2 AMBIENT AIR QUALITY MONITORING RESULTS

Table 3.2.1: Ambient Air Quality Monitoring Results for **Point A1: Project Boundary**

Parameter Monitored	Analysis Results Point A1	Malaysia Ambient Air Quality Standard (2020)
Particulate Matter <10 Micron (PM ₁₀)	32 µg/m ³	100 µg/m ³
Particulate Matter <2.5 Micron (PM _{2.5})	21 µg/m ³	35 µg/m ³
Sulphur Dioxide, SO ₂	29 µg/m ³	250 µg/m ³
Nitrogen Dioxide, NO ₂	35 µg/m ³	280 µg/m ³
Carbon Monoxide, CO	3 mg/m ³	30 mg/m ³
Ozone, O ₃	<1 µg/m ³	180 µg/m ³
Volatile Organic Compound, VOC	<0.1 µg/m ³	NA

Table 3.2.2: Ambient Air Quality Monitoring Results for **Point A2: Nearest Shophouse at Taman Seri Raia**

Parameter Monitored	Analysis Results Point A2	Malaysia Ambient Air Quality Standard (2020)
Particulate Matter <10 Micron (PM ₁₀)	24 µg/m ³	100 µg/m ³
Particulate Matter <2.5 Micron (PM _{2.5})	15 µg/m ³	35 µg/m ³
Sulphur Dioxide, SO ₂	23 µg/m ³	250 µg/m ³
Nitrogen Dioxide, NO ₂	27 µg/m ³	280 µg/m ³
Carbon Monoxide, CO	1 mg/m ³	30 mg/m ³
Ozone, O ₃	<1 µg/m ³	180 µg/m ³
Volatile Organic Compound, VOC	<0.1 µg/m ³	NA

Table 3.2.3: Ambient Air Quality Monitoring Results for Point A3: Nearest House at Kg Tekkah

Parameter Monitored	Analysis Results Point A3	Malaysia Ambient Air Quality Standard (2020)
Particulate Matter <10 Micron (PM ₁₀)	21 µg/m ³	100 µg/m ³
Particulate Matter <2.5 Micron (PM _{2.5})	13 µg/m ³	35 µg/m ³
Sulphur Dioxide, SO ₂	25 µg/m ³	250 µg/m ³
Nitrogen Dioxide, NO ₂	31 µg/m ³	280 µg/m ³
Carbon Monoxide, CO	1 mg/m ³	30 mg/m ³
Ozone, O ₃	<1 µg/m ³	180 µg/m ³
Volatile Organic Compound, VOC	<0.1 µg/m ³	NA

Table 3.2.4: Ambient Air Quality Monitoring Results for Point A4: Entrance at Auasia Nutriculture (Agro Based Industry)

Parameter Monitored	Analysis Results Point A4	Malaysia Ambient Air Quality Standard (2020)
Particulate Matter <10 Micron (PM ₁₀)	30 µg/m ³	100 µg/m ³
Particulate Matter <2.5 Micron (PM _{2.5})	17 µg/m ³	35 µg/m ³
Sulphur Dioxide, SO ₂	20 µg/m ³	250 µg/m ³
Nitrogen Dioxide, NO ₂	24 µg/m ³	280 µg/m ³
Carbon Monoxide, CO	2 mg/m ³	30 mg/m ³
Ozone, O ₃	<1 µg/m ³	180 µg/m ³
Volatile Organic Compound, VOC	<0.1 µg/m ³	NA

Figure 3: Particulate Matter <10 Micron (PM₁₀) monitored on 24th – 25th August 2023.

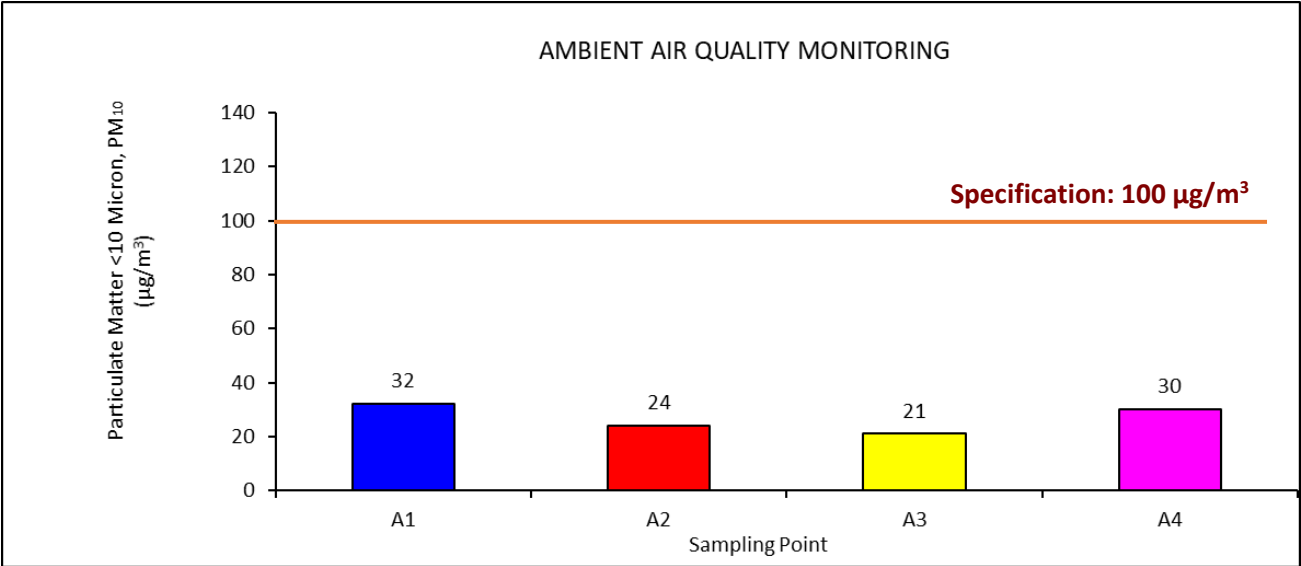
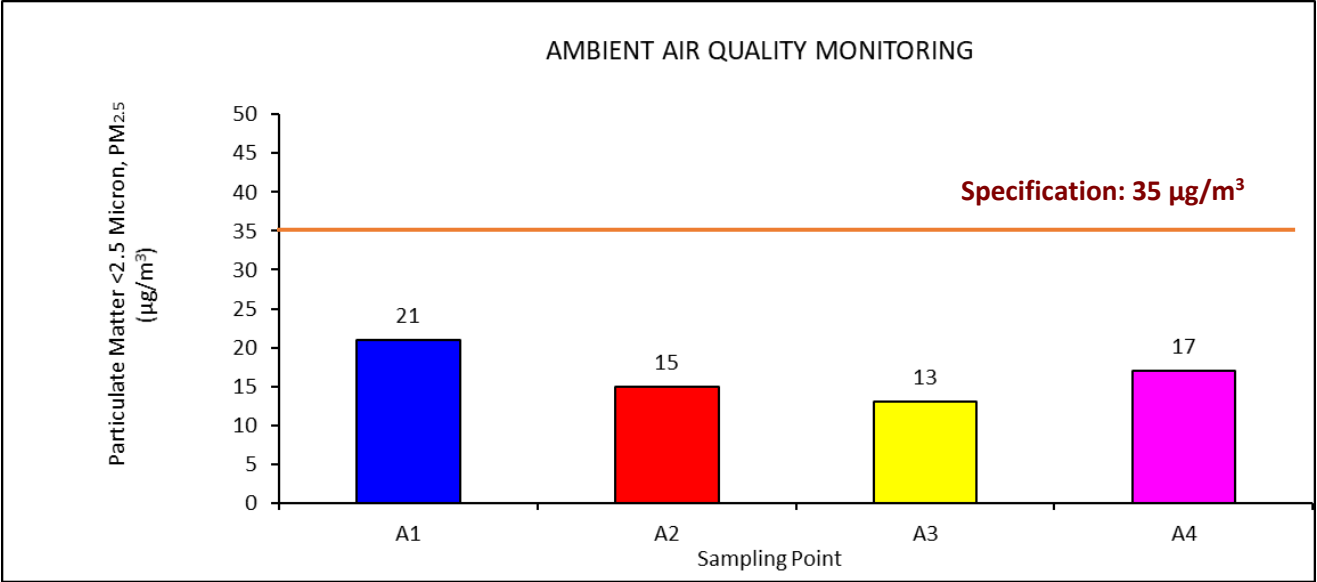


Figure 4: Particulate Matter <2.5 Micron (PM_{2.5}) monitored on 24th – 25th August 2023.



CUSTOMER : P2 OIL SDN. BHD.

REPORT REF : AMBIENT AIR QUALITY MONITORING

4.0 **CONCLUSION**

Generally, the ambient air quality monitored at **P2 Oil Sdn. Bhd.** for Point **A1, A2, A3,** and **A4** were **below** the Malaysia Ambient Air Quality Standard (2020).

Sampling and Analysis verified by,



.....
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Customer	P2 Oil Sdn. Bhd.
Our Ref.	LD/0823/8611/01(I)
Sample Received	25.08.2023
Sample Reported	04.09.2023
Sample Description	Air Sampling Media
Sample Marking	Ambient Air Quality Monitoring

Test Parameter	Test Method	Results	Malaysia Ambient Air Quality Standard (2020)
		A1	
Particulate Matter <10 Micron (PM ₁₀)	USEPA 40 Part 50, Appendix J	32 µg/m ³	100 µg/m ³
Particulate Matter <2.5 Micron (PM _{2.5})	USEPA 40 Part 50, Appendix L	21 µg/m ³	35 µg/m ³
Sulfur Dioxide, SO ₂	ISC 704A	29 µg/m ³	250 µg/m ³
*Nitrogen Dioxide, NO ₂	ISC 408	35 µg/m ³	280 µg/m ³
Carbon Monoxide, CO	EC-IAQ-01	3 mg/m ³	30 mg/m ³
Ozone, O ₃	EC-IAQ-04	<1 µg/m ³	180 µg/m ³
*Volatile Organic Compound, VOC	NIOSH 2549	<0.1 µg/m ³	NA

Note:

- 1) USEPA means United States Environmental Protection Agency
- 2) ISC means Intersociety Committee
- 3) * means Not Accredited

To:
KESPRO CONSULTANTS SDN. BHD.

For:
P2 OIL SDN. BHD.

Project: Proposed Pyrolysis Plant at Lot 225111,
Jalan Gopeng, Tungzen Industrial park, Mukim
Sungai Raya, 31300 Kampung Kepayang,
Perak Darul Ridzuan, Malaysia.

Verified by,

Ts. ChM. Dr. Nagendran Periaiah
B. Sc (Hons) Ind. Chem (UTM),
M. Tech. (Env. Mgmt.) (UM),
DBA (Env. Mgmt.) (IIUM),
Director/Chemist
MMIC Reg. No.: M/3186/4722/05/11

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CERTIFICATE OF ANALYSIS

Page 2 of 4

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Customer	P2 Oil Sdn. Bhd.
Our Ref.	LD/0823/8611/02(I)
Sample Received	25.08.2023
Sample Reported	04.09.2023
Sample Description	Air Sampling Media
Sample Marking	Ambient Air Quality Monitoring

Test Parameter	Test Method	Results	Malaysia Ambient Air Quality Standard (2020)
		A2	
Particulate Matter <10 Micron (PM ₁₀)	USEPA 40 Part 50, Appendix J	24 µg/m ³	100 µg/m ³
Particulate Matter <2.5 Micron (PM _{2.5})	USEPA 40 Part 50, Appendix L	15 µg/m ³	35 µg/m ³
Sulfur Dioxide, SO ₂	ISC 704A	23 µg/m ³	250 µg/m ³
*Nitrogen Dioxide, NO ₂	ISC 408	27 µg/m ³	280 µg/m ³
Carbon Monoxide, CO	EC-IAQ-01	1 mg/m ³	30 mg/m ³
Ozone, O ₃	EC-IAQ-04	<1 µg/m ³	180 µg/m ³
*Volatile Organic Compound, VOC	NIOSH 2549	<0.1 µg/m ³	NA

Note:

- 1) USEPA means United States Environmental Protection Agency
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- 3) * means Not Accredited

To:
KESPRO CONSULTANTS SDN. BHD.

For:
P2 OIL SDN. BHD.

Project: Proposed Pyrolysis Plant at Lot 225111,
Jalan Gopeng, Tungzen Industrial park, Mukim
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Page 3 of 4

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Customer	P2 Oil Sdn. Bhd.
Our Ref.	LD/0823/8611/03(I)
Sample Received	25.08.2023
Sample Reported	04.09.2023
Sample Description	Air Sampling Media
Sample Marking	Ambient Air Quality Monitoring

Test Parameter	Test Method	Results	Malaysia Ambient Air Quality Standard (2020)
		A3	
Particulate Matter <10 Micron (PM ₁₀)	USEPA 40 Part 50, Appendix J	21 µg/m ³	100 µg/m ³
Particulate Matter <2.5 Micron (PM _{2.5})	USEPA 40 Part 50, Appendix L	13 µg/m ³	35 µg/m ³
Sulfur Dioxide, SO ₂	ISC 704A	25 µg/m ³	250 µg/m ³
*Nitrogen Dioxide, NO ₂	ISC 408	31 µg/m ³	280 µg/m ³
Carbon Monoxide, CO	EC-IAQ-01	1 mg/m ³	30 mg/m ³
Ozone, O ₃	EC-IAQ-04	<1 µg/m ³	180 µg/m ³
*Volatile Organic Compound, VOC	NIOSH 2549	<0.1 µg/m ³	NA

Note:

- 1) USEPA means United States Environmental Protection Agency
- 2) ISC means Intersociety Committee
- 3) * means Not Accredited

To:
KESPRO CONSULTANTS SDN. BHD.

For:
P2 OIL SDN. BHD.

Project: Proposed Pyrolysis Plant at Lot 225111,
Jalan Gopeng, Tungzen Industrial park, Mukim
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Verified by,

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Page 4 of 4

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Customer	P2 Oil Sdn. Bhd.		
Our Ref.	LD/0823/8611/04(I)		
Sample Received	25.08.2023		
Sample Reported	04.09.2023		
Sample Description	Air Sampling Media		
Sample Marking	Ambient Air Quality Monitoring		
Test Parameter	Test Method	Results	Malaysia Ambient Air Quality Standard (2020)
		A4	
Particulate Matter <10 Micron (PM ₁₀)	USEPA 40 Part 50, Appendix J	30 µg/m ³	100 µg/m ³
Particulate Matter <2.5 Micron (PM _{2.5})	USEPA 40 Part 50, Appendix L	17 µg/m ³	35 µg/m ³
Sulfur Dioxide, SO ₂	ISC 704A	20 µg/m ³	250 µg/m ³
*Nitrogen Dioxide, NO ₂	ISC 408	24 µg/m ³	280 µg/m ³
Carbon Monoxide, CO	EC-IAQ-01	2 mg/m ³	30 mg/m ³
Ozone, O ₃	EC-IAQ-04	<1 µg/m ³	180 µg/m ³
*Volatile Organic Compound, VOC	NIOSH 2549	<0.1 µg/m ³	NA
Note: 1) USEPA means United States Environmental Protection Agency 2) ISC means Intersociety Committee 3) * means Not Accredited			
To: KESPRO CONSULTANTS SDN. BHD. For: P2 OIL SDN. BHD. Project: Proposed Pyrolysis Plant at Lot 225111, Jalan Gopeng, Tungzen Industrial park, Mukim Sungai Raya, 31300 Kampung Kepayang, Perak Darul Ridzuan, Malaysia.		Verified by,  Ts. ChM. Dr. Nagendran Periaiah <i>B. Sc (Hons) Ind. Chem (UTM), M. Tech. (Env. Mgmt.) (UM), DBA (Env. Mgmt.) (IIUM), Director/Chemist MMIC Reg. No.: M/3186/4722/05/11</i>	

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MONITORING PHOTOGRAPHS



A1: Project Boundary



A2: Nearest Shophouse at Taman Seri Raia



A3: Nearest House at Kg Tekkah



A4: Entrance at Auasia Nutriculture (Agro Based Industry)

P2 OIL SDN. BHD.



AMBIENT AIR QUALITY MONITORING – PLAN LAYOUT

Site Description: -

A1: Project Boundary

A2: Nearest Shophouse at Taman Seri
Raia

A3: Nearest House at Kg Tekkah

A4: Entrance at Auasia Nutriculture (Agro
Based Industry)

Prepared by:

KESPRO CONSULTANTS SDN. BHD.

Prepared for:

P2 OIL SDN. BHD.

APPENDIX 6.3
CERTIFICATE OF ANALYSIS (NOISE QUALITY)

BOUNDARY NOISE MONITORING REPORT AUGUST 2023

PREPARED FOR:

P2 OIL SDN. BHD.

Project: Proposed Pyrolysis Plant at Lot 225111, Jalan Gopeng, Tungzen Industrial park, Mukim Sungai Raya, 31300 Kampung Kepayang, Perak Darul Ridzuan, Malaysia.

REPORT REF:

EC/0823/03570(3)

MONITORING DATE:

24th – 25th August 2023

REPORTING DATE:

8th September 2023

CUSTOMER : P2 OIL SDN. BHD.
REPORT REF : BOUNDARY NOISE MONITORING

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CONTENT	PAGE NUMBER
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2.0 SCOPE OF MEASUREMENT	3
3.0 METHODOLOGY	4
4.0 RESULTS	6
5.0 OBSERVATION	14
6.0 CONCLUSION	15
APPENDIX	

1.0 INTRODUCTION

Kespro Consultants Sdn. Bhd. was engaged by **P2 Oil Sdn. Bhd.**, to conduct Boundary Noise Monitoring on 24th – 25th August 2023 for: -

P2 OIL SDN. BHD.

Project: Proposed Pyrolysis Plant at Lot 225111, Jalan Gopeng, Tungzen Industrial park, Mukim Sungai Raya, 31300 Kampung Kepayang, Perak Darul Ridzuan, Malaysia.

The objective of the monitoring was to determine the noise characteristic at surrounding of company boundary in order to fulfill Malaysian Recommended Noise Limit. The Equivalent Continuous Sound Level, LA_{eq} recommended level for **point N1** and **point N4** at 70.0 dB (A) for Day time and 65.0 dB (A) for Night time respectively for Industrial Zones, for **point N2** and **point N3** at 60.0 dB (A) for Day time and 55.0 dB (A) for Night time respectively for Suburban Residential (Medium Density) specified in First Schedule, Recommended Permissible Sound Level (LA_{eq}) By Receiving Land Use For New Development, Guidelines for Environmental Noise Limits and Control, Department of Environment Malaysia, 2019.

At the primary location, A-weighted noise levels (LA) were measured for Day time and Night time for continuous 24 hours.

Details of the monitoring are as follows: -

1.1 Date of Sampling

24th – 25th August 2023

1.2 Sampling Personnel

- | | |
|-------------------------------------|------------------|
| a) Mr. Mohd Zaibidi Bin Ramli | Field Technician |
| b) Mr. Muhammad Afiq Bin Mohd Zaidi | Field Technician |

1.3 Person in Charge at Site

- a) Mr. Abraham

1.4 Site Description

Point ID	Location	Monitoring Date & Time		Coordinate
		Start	End	
N1	Project Boundary	24 th August 2023 10.20 am	25 th August 2023 10.20 am	4°30'44.4"N 101°08'54.6"E
N2	Nearest Shophouse at Taman Seri Raia	24 th August 2023 9.00 am	25 th August 2023 9.00 am	4°30'38.6"N 101°08'24.7"E
N3	Nearest House at Kg Tekkah	24 th August 2023 9.35 am	25 th August 2023 9.35 am	4°30'05.6"N 101°08'48.6"E
N4	Entrance at Auasia Nutriculture (Agro Based Industry)	24 th August 2023 10.40 am	25 th August 2023 10.40 am	4°30'53.3"N 101°09'04.0"E

Note: Actual measurement location attached in appendix.

2.0 SCOPE OF MEASUREMENT

The noise characteristic survey was carried out for the parameters as required in Malaysian Recommended Noise Limit.

- 1) Equivalent Continuous Sound Level (LA_{eq})
- 2) Statistical Indices (LA_{10} , LA_{50} and LA_{90})
- 3) Maximum Noise Level (LA_{max})
- 4) Minimum Noise Level (LA_{min})

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3.0 METHODOLOGY

3.1 Sampling Method: Environmental Noise

The sound levels were monitored for a period of 24 hours for a day. Boundary noise measurements were performed using the following equipment.

Equipment 1 - 3 : Sound Level Meter
Made : Larson Davis
Model : Spark 706
Serial Num. : 02797, 17906, 18511

Equipment 4 : Sound Level Meter
Made : Larson Davis
Model : SoundTrack LxT1
Serial Num. : 0003298

Equipment : Sound Calibrator
Made : Larson Davis
Model : CAL 200
Serial Num. : 10198

Sound level meter was calibrated with a sound calibrator prior and after the measurements, in accordance to the calibration procedures of the respective instruments. External calibration records of the equipment attached in Appendix.

3.2 Procedure

- 1) Check the battery condition.
- 2) Calibrate using calibration signal oscillator.
- 3) Set the desired frequency weighting (A – weighting).
- 4) Set the meter range to the most suitable setting.
- 5) Set the measurement time for 24 hours.
- 6) Place the microphone away from any reflecting surface such as measurer and the floors.
- 7) Set the run mode to initiate the measurements.

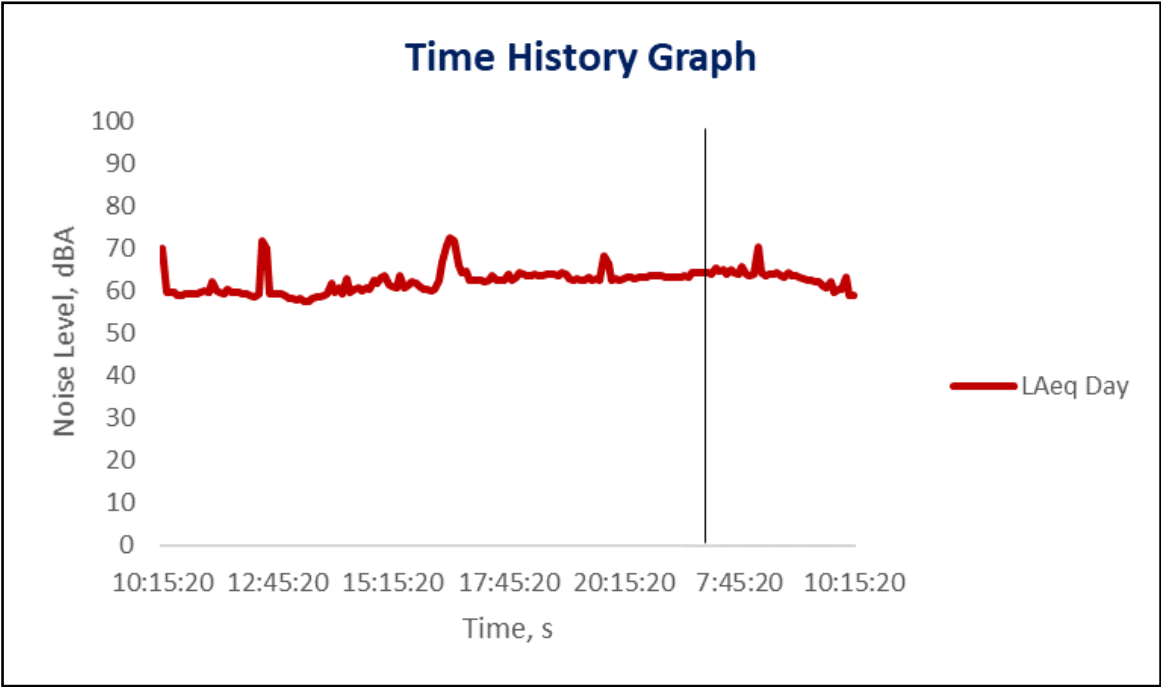
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4.0 **RESULTS**

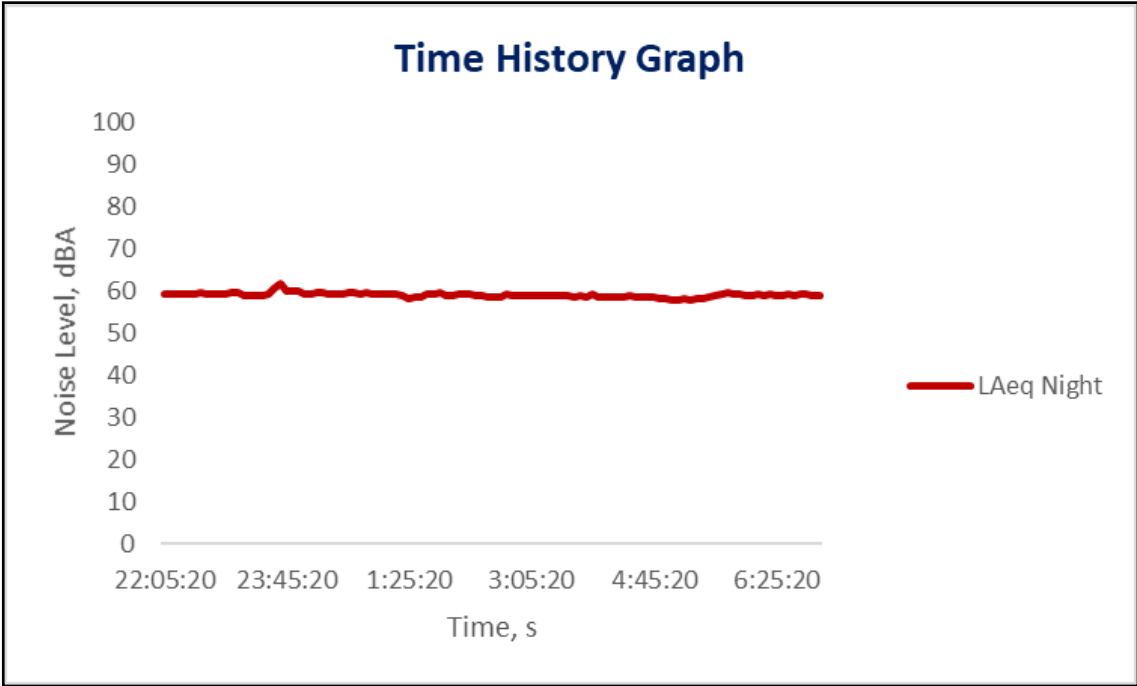
4.1 Noise Characteristic result of boundary noise level measurement for **Point N1-Project Boundary** on 24th – 25th August 2023 are as follows:

Sampling Point/Time	LA _{eq} dB (A)	LA ₁₀ dB (A)	LA ₅₀ dB (A)	LA ₉₀ dB (A)	LA _{min} dB (A)	LA _{max} dB (A)	Recommended Limit LA _{eq} [dB (A)]
Point N1 7.00 am to 10.00 pm	62.4	64.5	62.7	59.2	56.1	92.2	Not Exceeding 70.0 dB(A) for Day time
Point N1 10.00 pm to 7.00 am	59.0	59.5	59.0	58.5	55.1	76.4	Not Exceeding 65.0 dB(A) for Night time

LA_{eq} Graph for Point N1 Day time



LA_{eq} Graph for Point N1 Night time



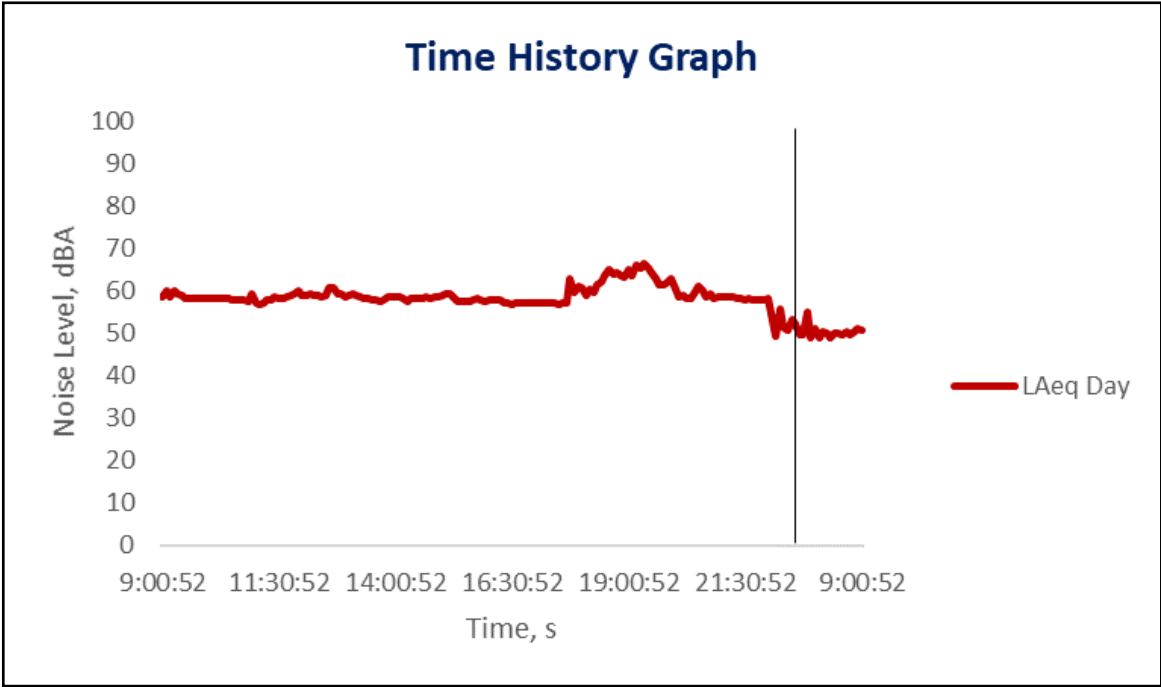
CUSTOMER : P2 OIL SDN. BHD.

REPORT REF : BOUNDARY NOISE MONITORING

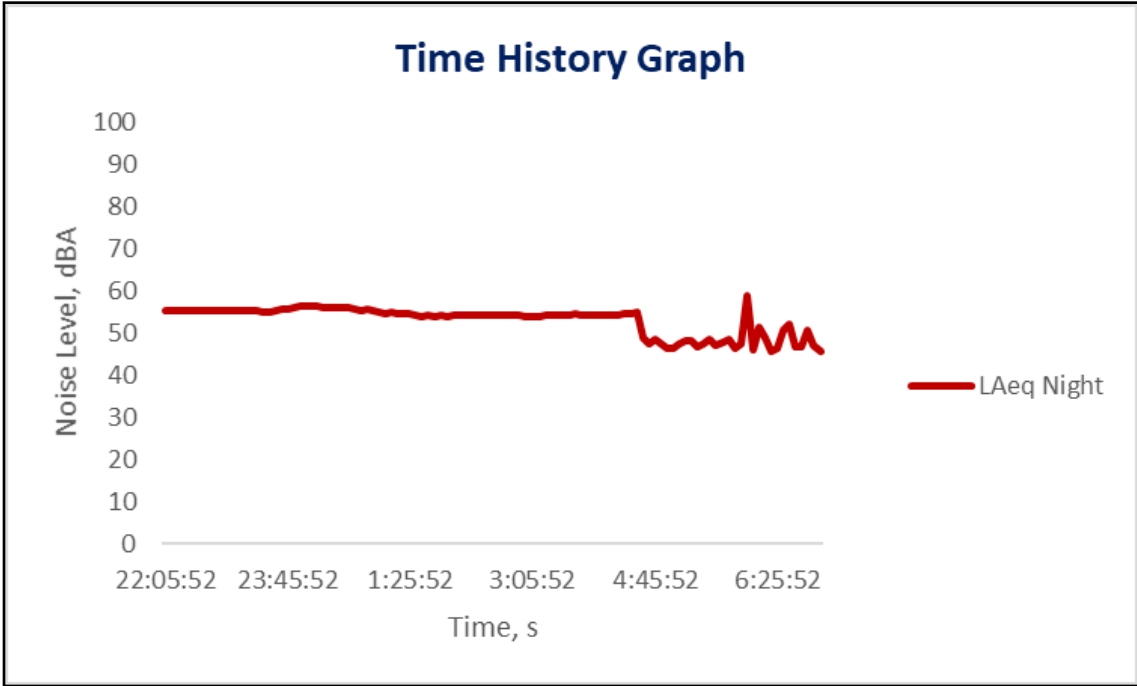
4.2 Noise Characteristic result of boundary noise level measurement for **Point N2: Nearest Shophouse at Taman Seri Raia** on 24th – 25th August 2023 are as follows:

Sampling Point/ Time	LA _{eq} dB (A)	LA ₁₀ dB (A)	LA ₅₀ dB (A)	LA ₉₀ dB (A)	LA _{min} dB (A)	LA _{max} dB (A)	Recommended Limit LA _{eq} [dB (A)]
Point N2 7.00 am to 10.00 pm	58.1	61.6	58.4	51.6	45.5	78.9	Not Exceeding 60.0 dB(A) for Day time
Point N2 10.00 pm to 7.00 am	53.0	55.9	54.3	47.2	42.5	74.0	Not Exceeding 55.0 dB(A) for Night time

LA_{eq} Graph for Point N2 Day time



LA_{eq} Graph for Point N2 Night time



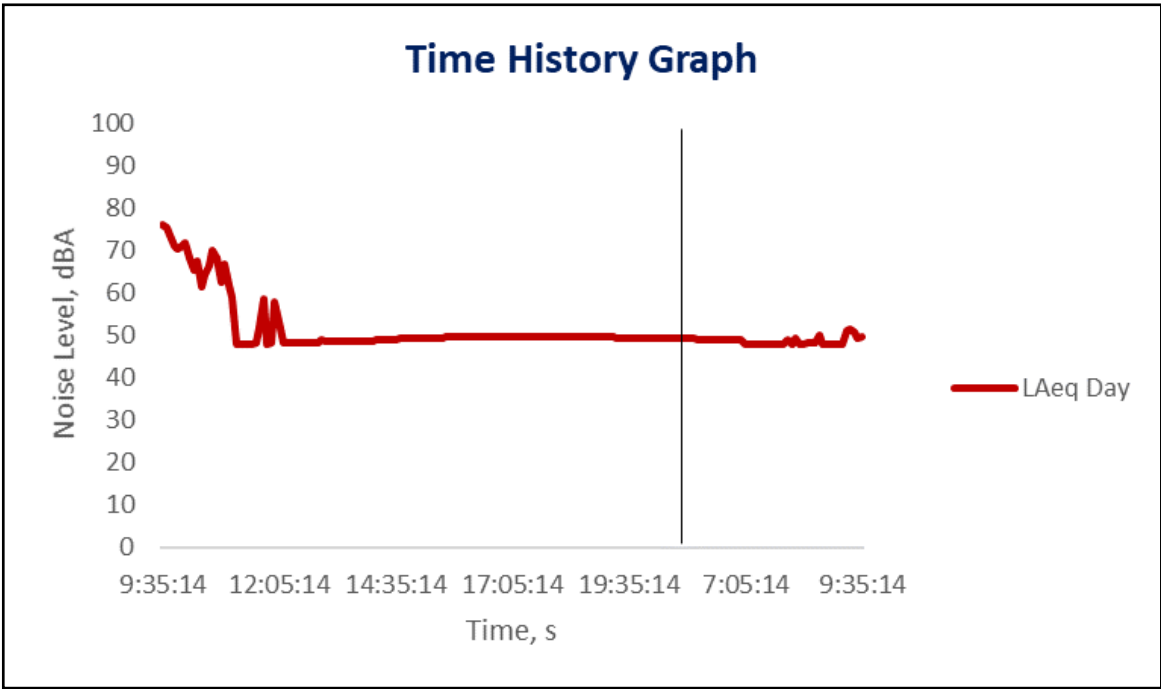
CUSTOMER : P2 OIL SDN. BHD.

REPORT REF : BOUNDARY NOISE MONITORING

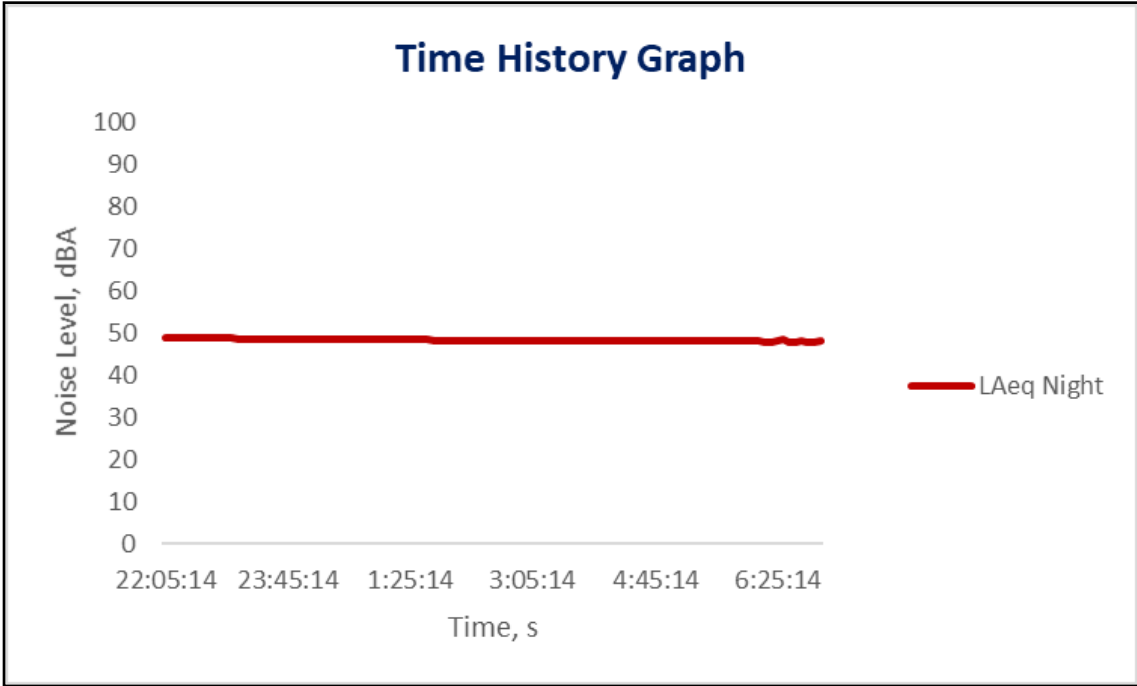
4.3 Noise Characteristic result of boundary noise level measurement for **Point N3: Nearest House at Kg Tekkah** on 24th – 25th August 2023 are as follows: -

Sampling Point/ Time	LA _{eq} dB (A)	LA ₁₀ dB (A)	LA ₅₀ dB (A)	LA ₉₀ dB (A)	LA _{min} dB (A)	LA _{max} dB (A)	Recommended Limit LA _{eq} [dB (A)]
Point N3 7.00 am to 10.00 pm	51.2	59.0	49.3	48.1	47.9	89.6	Not Exceeding 60.0 dB(A) for Day time
Point N3 10.00 pm to 7.00 am	48.3	48.8	48.3	48.0	47.9	57.1	Not Exceeding 55.0 dB(A) for Night time

LAeq Graph for Point N3 Day time



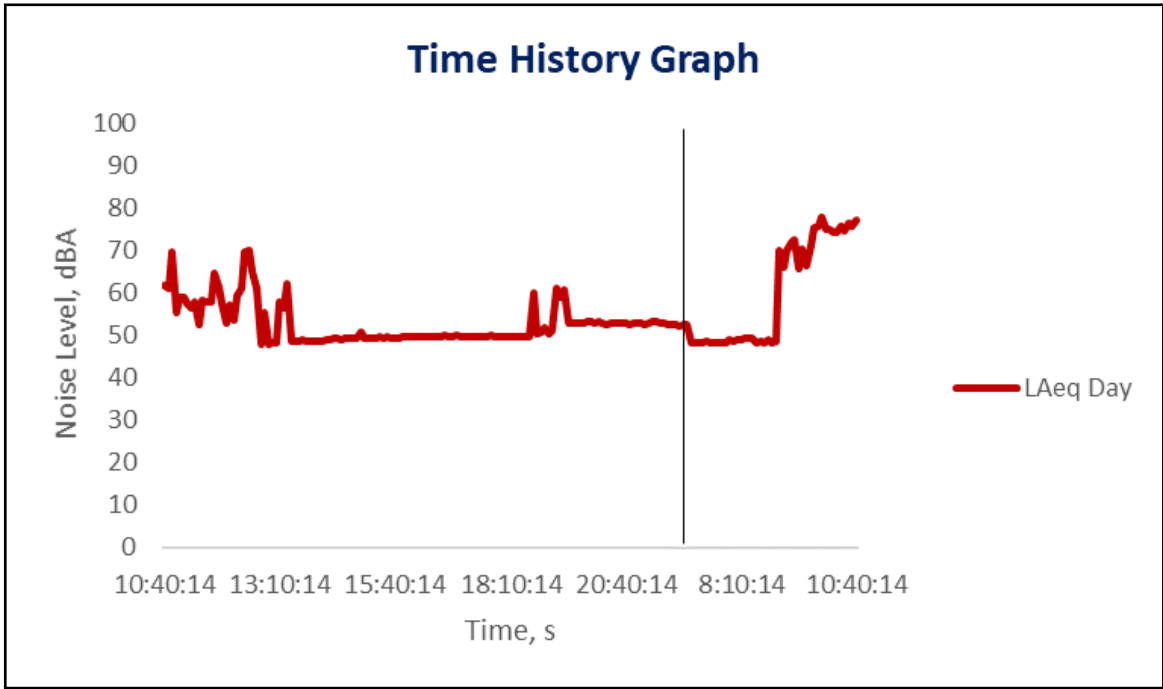
LAeq Graph for Point N3 Night time



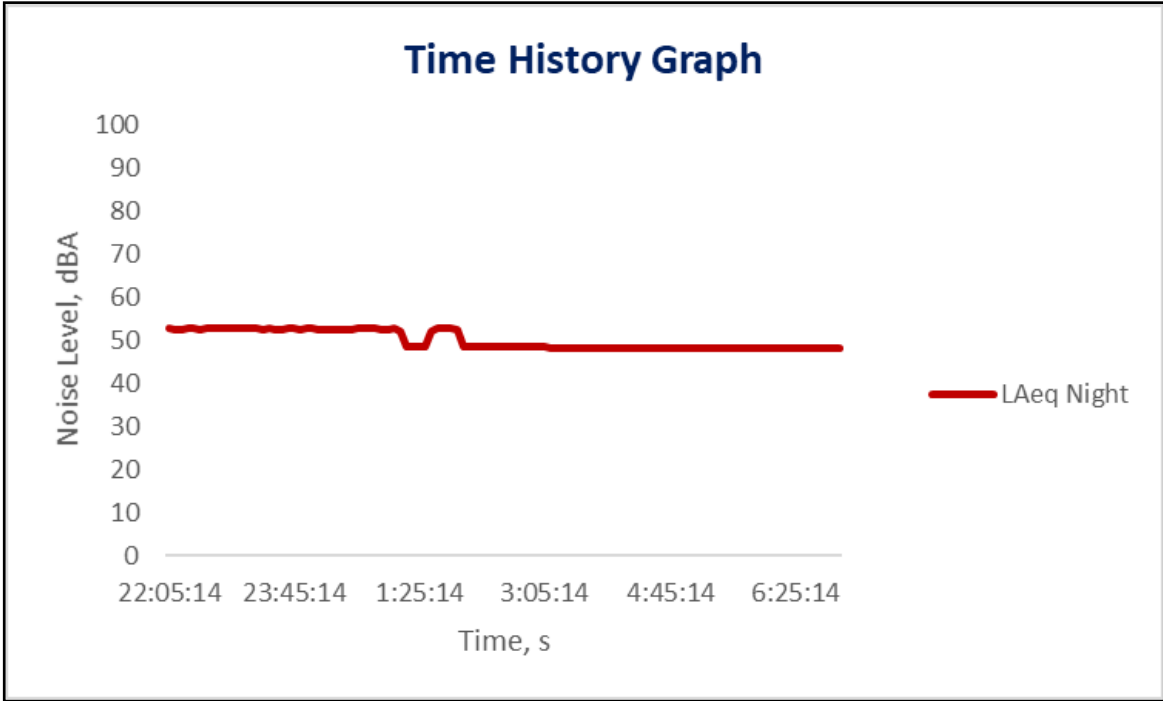
4.4 Noise Characteristic result of boundary noise level measurement for **Point N4:**
Entrance at Auasia Nutriculture (Agro Based Industry) on 24th – 25th August 2023 are
as follows: -

Sampling Point/ Time	LA _{eq} dB (A)	LA ₁₀ dB (A)	LA ₅₀ dB (A)	LA ₉₀ dB (A)	LA _{min} dB (A)	LA _{max} dB (A)	Recommended Limit LA _{eq} [dB (A)]
Point N4 7.00 am to 10.00 pm	54.6	70.1	50.6	48.5	48.0	93.0	Not Exceeding 70.0 dB(A) for Day time
Point N4 10.00 pm to 7.00 am	50.0	52.8	48.4	48.2	46.1	55.5	Not Exceeding 65.0 dB(A) for Night time

LAeq Graph for Point N4 Day time



LAeq Graph for Point N4 Night time



5.0 OBSERVATION

The Equivalent Continuous Sound Level, LA_{eq} recommended level for **point N1**, and **point N4** at 70.0 dB (A) for Day time and 65.0 dB (A) for Night time respectively for Industrial Zones, for **point N2** and **point N3** at 60.0 dB (A) for Day time and 55.0 dB (A) for Night time respectively for Suburban Residential (Medium Density) specified in First Schedule, Recommended Permissible Sound Level (LA_{eq}) By Receiving Land Use For New Development, Guidelines for Environmental Noise Limits and Control, Department of Environment Malaysia, 2019.

Based on site observation, the source of noise contribution at the particular points and it's possibly contributed from are as follows: -

Sampling Location	Noise Source
N1	Noise from machine crusher and vehicles movement include lorries.
N2	Noise from vehicles movement.
N3	
N4	Noise from vehicles movement include lorries.

6.0 CONCLUSION

Generally, the Boundary Noise Monitoring at **P2 Oil Sdn. Bhd.** for point **N1, N2, N3** and **N4** for Day time and Night time were **below** the Malaysian Recommended Limit.

The monitoring was carried out during normal site operation.

Sampling and Analysis verified by,



.....
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Director/Chemist

MMIC Reg. No.: M/3186/4722/05/11

APPENDIX

Specialist in Environmental Monitoring & Testing Laboratory Services

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NOISE RAW DATA

Page 1 of 8

Customer	P2 Oil Sdn. Bhd.
Our Ref.	LD/0823/8611/01
Sample Received	25.08.2023
Sample Reported	04.09.2023
Sampling Date	24 th – 25 th August 2023

Station Monitored	Date Monitored	Time Monitored	LAeq (dBA)	LAmx (dBA)	LAmin (dBA)
N1	24 th August 2023 (Day time)	10:15:20	70.1	92.2	59.1
		10:20:20	59.9	67.3	58.7
		10:25:20	59.8	66.0	58.5
		10:30:20	59.9	70.8	58.1
		10:35:20	59.0	65.3	57.7
		10:40:20	59.1	63.4	57.7
		10:45:20	59.2	65.1	58.0
		10:50:20	59.5	67.4	58.1
		10:55:20	59.4	64.5	58.0
		11:00:20	59.2	63.1	58.0
		11:05:20	59.9	63.1	58.0
		11:10:20	60.1	63.0	58.5
		11:15:20	59.8	63.4	58.6
		11:20:20	62.3	69.8	59.0
		11:25:20	60.1	61.8	59.1
		11:30:20	59.8	64.9	57.7
		11:35:20	59.4	61.6	58.1
		11:40:20	60.4	68.1	58.4
		11:45:20	59.7	68.2	58.3
		11:50:20	59.6	72.5	58.0
		11:55:20	59.7	82.1	57.6
		12:00:20	59.3	65.5	57.7
		12:05:20	59.4	77.0	57.9
		12:10:20	59.0	62.0	57.6
		12:15:20	58.8	68.3	57.3
		12:20:20	59.2	76.2	57.6
		12:25:20	72.0	82.3	57.9
		12:30:20	69.9	82.5	57.8
		12:35:20	59.2	63.6	57.5
		12:40:20	59.2	62.5	57.9
		12:45:20	59.5	64.0	57.9
		12:50:20	59.4	64.4	58.1
		12:55:20	59.1	63.5	57.1
		13:00:20	58.4	60.9	56.9
		13:05:20	58.3	68.2	56.7
		13:10:20	58.1	70.5	56.5
		13:15:20	58.3	82.3	56.1
		13:20:20	57.5	64.8	56.1
		13:25:20	57.6	68.9	56.2
		13:30:20	58.2	70.6	56.3
		13:35:20	58.5	61.0	57.0
		13:40:20	58.6	70.8	56.9
		13:45:20	58.9	72.3	56.7
		13:50:20	59.4	77.0	57.1
		13:55:20	61.8	87.8	57.3

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No.5A-B, 7A-7B, Lorong Temenggung 15A, Taman Evergreen, 42900 Klang, Selangor Darul Ehsan.

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Email: info@envichem.com.my Website: www.envichem.com.my

Specialist in Environmental Monitoring & Testing Laboratory Services

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Page 2 of 8

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Our Ref.	LD/0823/8611/01
Sample Received	25.08.2023
Sample Reported	04.09.2023
Sampling Date	24 th – 25 th August 2023

Station Monitored	Date Monitored	Time Monitored	LAeq (dBA)	LAmx (dBA)	LAmin (dBA)
N1	24 th August 2023 (Day time)	14:00:20	59.8	82.3	56.5
		14:05:20	60.9	82.8	56.9
		14:10:20	59.2	69.3	57.1
		14:15:20	63.0	87.8	57.1
		14:20:20	59.9	83.1	57.5
		14:25:20	60.3	77.0	57.5
		14:30:20	60.9	75.1	58.1
		14:35:20	60.0	76.9	58.2
		14:40:20	60.8	77.1	58.4
		14:45:20	60.5	71.5	58.6
		14:50:20	62.6	72.5	59.0
		14:55:20	61.7	67.8	59.5
		15:00:20	63.3	71.5	59.8
		15:05:20	63.8	66.1	61.4
		15:10:20	61.5	71.3	58.7
		15:15:20	61.0	64.2	59.5
		15:20:20	60.9	72.0	59.0
		15:25:20	63.6	89.7	59.3
		15:30:20	60.9	75.1	59.0
		15:35:20	61.6	80.9	58.6
		15:40:20	62.3	81.4	58.7
		15:45:20	61.8	83.1	58.7
		15:50:20	61.2	82.6	58.7
		15:55:20	60.5	70.9	58.5
		16:00:20	60.5	66.7	58.5
		16:05:20	60.2	63.1	58.9
		16:10:20	60.5	70.8	58.9
		16:15:20	62.6	73.0	59.1
		16:20:20	66.7	77.1	64.2
		16:25:20	70.9	77.8	66.1
		16:30:20	72.7	79.0	67.6
		16:35:20	71.9	76.6	68.2
		16:40:20	66.3	72.4	64.0
		16:45:20	64.5	71.7	62.4
		16:50:20	64.6	75.8	61.9
		16:55:20	62.7	64.6	61.9
		17:00:20	62.5	64.2	61.5
		17:05:20	62.5	66.1	61.3
		17:10:20	62.5	65.5	61.5
		17:15:20	62.3	64.4	61.5
		17:20:20	62.5	67.2	61.8
		17:25:20	63.5	73.3	61.9
		17:30:20	62.6	63.6	61.8
		17:35:20	62.7	67.5	61.9
		17:40:20	62.5	66.9	61.7

ENVICHEM CONSULTS SDN. BHD (685031-V)

No.5A-B, 7A-7B, Lorong Temenggung 15A, Taman Evergreen, 42900 Klang, Selangor Darul Ehsan.

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Customer	P2 Oil Sdn. Bhd.
Our Ref.	LD/0823/8611/01
Sample Received	25.08.2023
Sample Reported	04.09.2023
Sampling Date	24 th – 25 th August 2023

Station Monitored	Date Monitored	Time Monitored	LAeq (dBA)	LAmx (dBA)	LAmin (dBA)
N1	24 th August 2023 (Day time)	17:45:20	64.1	75.6	61.9
		17:50:20	62.7	64.8	62.0
		17:55:20	63.3	64.9	62.3
		18:00:20	64.5	73.0	61.7
		18:05:20	63.9	65.9	63.2
		18:10:20	63.7	68.1	63.0
		18:15:20	63.8	68.2	62.1
		18:20:20	64.0	69.0	62.9
		18:25:20	63.6	66.4	62.4
		18:30:20	63.8	68.5	62.1
		18:35:20	63.9	74.1	62.4
		18:40:20	63.9	66.2	62.8
		18:45:20	63.9	66.7	62.7
		18:50:20	63.8	65.8	62.8
		18:55:20	64.3	70.2	63.1
		19:00:20	63.9	72.1	62.1
		19:05:20	63.0	70.6	61.0
		19:10:20	62.7	66.7	61.6
		19:15:20	62.9	71.4	61.7
		19:20:20	62.6	67.4	61.3
		19:25:20	62.7	70.0	61.6
		19:30:20	63.4	74.9	61.5
		19:35:20	62.6	66.8	60.8
		19:40:20	62.9	71.2	61.5
		19:45:20	62.5	66.9	61.8
		19:50:20	68.4	81.9	61.7
		19:55:20	66.6	83.9	61.6
		20:00:20	62.5	68.0	61.3
		20:05:20	62.8	69.8	61.7
		20:10:20	62.6	66.8	61.7
		20:15:20	63.1	64.6	62.5
		20:20:20	63.2	67.4	62.2
		20:25:20	63.2	65.2	62.5
		20:30:20	63.1	67.5	62.2
		20:35:20	63.4	66.5	62.6
		20:40:20	63.4	67.1	62.4
		20:45:20	63.4	66.0	62.7
		20:50:20	63.5	66.4	62.7
		20:55:20	63.6	67.4	62.7
		21:00:20	63.6	66.1	62.5
		21:05:20	63.5	66.0	62.7
		21:10:20	63.4	64.3	62.5
		21:15:20	63.4	65.2	62.7
		21:20:20	63.3	65.5	62.5
		21:25:20	63.3	68.7	62.4

ENVICHEM CONSULTS SDN. BHD (685031-V)

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Customer	P2 Oil Sdn. Bhd.
Our Ref.	LD/0823/8611/01
Sample Received	25.08.2023
Sample Reported	04.09.2023
Sampling Date	24 th – 25 th August 2023

Station Monitored	Date Monitored	Time Monitored	LAeq (dBA)	LAmx (dBA)	LMin (dBA)
N1	24 th August 2023 (Day time)	21:30:20	63.2	66.7	62.5
		21:35:20	63.7	71.4	62.5
		21:40:20	63.3	67.6	62.3
		21:45:20	64.2	66.8	63.5
		21:50:20	64.2	66.0	63.5
		21:55:20	64.2	67.6	63.4
		22:00:20	64.3	67.8	63.5
		22:05:20	59.4	63.1	56.7
		22:10:20	59.3	66.3	56.5
		22:15:20	59.4	62.4	56.7
	24 th August 2023 (Night time)	22:20:20	59.3	69.8	56.7
		22:25:20	59.2	66.8	56.4
		22:30:20	59.4	67.4	56.8
		22:35:20	59.5	61.1	56.7
		22:40:20	59.3	76.4	56.2
		22:45:20	59.2	55.9	56.5
		22:50:20	59.1	62.1	56.5
		22:55:20	59.2	59.6	56.5
		23:00:20	59.6	62.2	56.5
		23:05:20	59.5	62.7	56.6
		23:10:20	59.0	59.8	56.4
		23:15:20	59.0	56.4	56.1
		23:20:20	59.0	74.1	56.2
		23:25:20	59.0	72.3	56.2
		23:30:20	59.1	64.5	55.8
		23:35:20	60.5	66.7	56.5
		23:40:20	61.7	57.0	57.3
		23:45:20	60.1	68.9	56.5
		23:50:20	60.0	65.0	56.5
		23:55:20	59.9	54.5	56.6
	25 th August 2023 (Night time)	0:00:20	59.3	64.9	56.7
		0:05:20	59.3	53.7	56.6
		0:10:20	59.6	60.7	57.0
		0:15:20	59.5	56.5	56.2
		0:20:20	59.4	50.6	55.6
		0:25:20	59.4	60.8	56.2
		0:30:20	59.3	55.9	56.6
		0:35:20	59.5	69.1	56.8
		0:40:20	59.7	64.8	56.7
		0:45:20	59.3	58.9	56.6
		0:50:20	59.5	62.6	56.8
		0:55:20	59.3	69.8	56.5
		1:00:20	59.3	51.9	56.7
		1:05:20	59.4	64.9	56.7
		1:10:20	59.4	56.5	56.9

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Customer	P2 Oil Sdn. Bhd.
Our Ref.	LD/0823/8611/01
Sample Received	25.08.2023
Sample Reported	04.09.2023
Sampling Date	24 th – 25 th August 2023

Station Monitored	Date Monitored	Time Monitored	LAeq (dBA)	LAmx (dBA)	LAmn (dBA)
N1	25 th August 2023 (Night time)	1:15:20	59.3	53.7	56.4
		1:20:20	58.8	51.5	55.4
		1:25:20	58.3	48.6	55.2
		1:30:20	58.4	51.9	55.3
		1:35:20	58.6	51.3	55.9
		1:40:20	59.1	54.9	56.4
		1:45:20	59.1	53.9	56.4
		1:50:20	59.5	66.6	56.3
		1:55:20	58.9	55.7	56.3
		2:00:20	59.0	58.2	56.4
		2:05:20	59.1	56.3	56.5
		2:10:20	59.1	50.0	56.3
		2:15:20	59.2	51.7	56.4
		2:20:20	59.0	54.7	56.1
		2:25:20	58.8	60.7	56.0
		2:30:20	58.7	58.8	56.1
		2:35:20	58.7	49.8	56.1
		2:40:20	58.7	63.6	56.1
		2:45:20	59.1	55.6	56.1
		2:50:20	58.8	62.9	56.1
		2:55:20	58.9	54.6	56.1
		3:00:20	58.8	54.4	56.1
		3:05:20	58.8	55.9	56.1
		3:10:20	58.9	56.8	56.1
		3:15:20	58.9	48.1	56.1
		3:20:20	58.8	56.8	56.1
		3:25:20	58.8	48.4	56.1
		3:30:20	58.9	49.9	56.1
		3:35:20	58.8	61.0	56.1
		3:40:20	58.7	55.7	56.1
		3:45:20	58.9	48.1	55.9
		3:50:20	58.5	48.2	55.2
		3:55:20	59.1	49.4	56.1
		4:00:20	58.6	59.1	55.8
		4:05:20	58.7	50.6	56.1
		4:10:20	58.6	53.8	55.9
		4:15:20	58.6	47.9	55.9
		4:20:20	58.6	47.9	55.9
		4:25:20	58.8	58.6	56.1
		4:30:20	58.6	60.3	56.1
		4:35:20	58.6	69.0	55.9
		4:40:20	58.7	52.9	56.1
		4:45:20	58.4	50.2	55.2
		4:50:20	58.1	49.7	55.3
		4:55:20	58.2	51.1	55.3

ENVICHEM CONSULTS SDN. BHD (685031-V)

No.5A-B, 7A-7B, Lorong Temenggung 15A, Taman Evergreen, 42900 Klang, Selangor Darul Ehsan.

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Customer	P2 Oil Sdn. Bhd.
Our Ref.	LD/0823/8611/01
Sample Received	25.08.2023
Sample Reported	04.09.2023
Sampling Date	24 th – 25 th August 2023

Station Monitored	Date Monitored	Time Monitored	LAeq (dBA)	LAmx (dBA)	LAmn (dBA)
N1	25 th August 2023 (Night time)	5:00:20	57.7	48.8	55.3
		5:05:20	57.9	49.6	55.1
		5:10:20	58.1	57.1	55.2
		5:15:20	57.9	50.4	55.4
		5:20:20	58.1	54.5	55.4
		5:25:20	58.3	55.9	55.4
		5:30:20	58.6	58.3	56.0
		5:35:20	58.9	49.5	55.7
		5:40:20	59.4	53.7	55.8
		5:45:20	59.7	49.5	56.2
		5:50:20	59.2	52.6	56.3
		5:55:20	59.4	52.4	56.5
		6:00:20	58.9	62.5	56.2
		6:05:20	59.0	53.7	56.3
		6:10:20	59.1	50.4	56.3
		6:15:20	59.0	50.9	56.3
		6:20:20	59.4	71.6	56.2
		6:25:20	58.8	62.2	56.1
		6:30:20	58.9	63.0	56.2
		6:35:20	59.1	54.8	55.4
	25 th August 2023 (Day time)	6:40:20	58.9	74.2	56.2
		6:45:20	59.1	61.0	55.8
		6:50:20	59.3	59.0	56.3
		6:55:20	59.0	63.3	56.2
		7:00:20	58.9	70.2	56.3
		7:05:20	64.2	74.8	63.3
		7:10:20	63.9	65.7	62.8
		7:15:20	65.5	79.0	63.3
		7:20:20	64.9	80.9	63.2
		7:25:20	65.2	75.4	63.5
		7:30:20	64.1	69.8	63.0
		7:35:20	65.0	76.2	63.1
		7:40:20	64.5	69.1	62.9
		7:45:20	64.1	71.9	62.9
		7:50:20	65.9	75.5	63.1
		7:55:20	64.0	70.7	63.1
		8:00:20	63.8	65.0	62.8
		8:05:20	63.9	71.7	62.3
		8:10:20	70.6	78.9	62.9
		8:15:20	64.5	74.0	63.1
		8:20:20	63.8	65.1	63.1
		8:25:20	64.0	67.1	63.1
		8:30:20	64.1	74.0	63.0
		8:35:20	64.3	69.5	62.8
		8:40:20	63.8	67.6	62.7

ENVICHEM CONSULTS SDN. BHD (685031-V)

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Customer	P2 Oil Sdn. Bhd.
Our Ref.	LD/0823/8611/01
Sample Received	25.08.2023
Sample Reported	04.09.2023
Sampling Date	24 th – 25 th August 2023

Station Monitored	Date Monitored	Time Monitored	LAeq (dBA)	LAmx (dBA)	LAmin (dBA)
N1	25 th August 2023 (Day time)	8:45:20	63.4	64.8	62.8
		8:50:20	64.2	67.3	62.9
		8:55:20	63.8	65.8	62.8
		9:00:20	63.5	64.7	62.7
		9:05:20	63.4	70.9	62.2
		9:10:20	62.8	66.5	61.2
		9:15:20	62.7	64.0	61.7
		9:20:20	62.7	65.0	61.0
		9:25:20	62.4	64.8	61.0
		9:30:20	62.2	71.4	59.7
		9:35:20	61.1	64.7	60.0
		9:40:20	60.8	62.5	59.4
		9:45:20	62.2	71.8	59.1
		9:50:20	59.9	61.3	59.0
		9:55:20	60.3	64.7	59.0
		10:00:20	60.4	63.6	59.1
		10:05:20	63.2	73.0	58.0
		10:10:20	59.1	60.8	57.9
		10:15:20	59.1	62.3	57.6

ENVICHEM CONSULTS SDN. BHD (685031-V)

No.5A-B, 7A-7B, Lorong Temenggung 15A, Taman Evergreen, 42900 Klang, Selangor Darul Ehsan.

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CERTIFICATE OF ANALYSIS

Page 8 of 8

Customer	P2 Oil Sdn. Bhd.
Our Ref.	LD/0823/8611/01
Sample Received	25.08.2023
Sample Reported	04.09.2023
Sampling Date	24 th – 25 th August 2023

Sampling Point/ Time	L _{Aeq} dB (A)	L _{A10} dB (A)	L _{A50} dB (A)	L _{A90} dB (A)	L _{Amin} dB (A)	L _{Amax} dB (A)	Recommended Limit L _{Aeq} [dB (A)]	Comment
Point N1 Day time	62.4	64.5	62.7	59.2	56.1	92.2	70.0 dB(A) for Day time	Not Exceed
Point N1 Night time	59.0	59.5	59.0	58.5	55.1	76.4	65.0 dB(A) for Night time	Not Exceed

To: KESPRO CONSULTANTS SDN. BHD. For: P2 OIL SDN. BHD. Project: Proposed Pyrolysis Plant at Lot 225111, Jalan Gopeng, Tungzen Industrial park, Mukim Sungai Raya, 31300 Kampung Kepayang, Perak Darul Ridzuan, Malaysia.	Verified By,  ----- Ts. ChM. Dr. Nagendran Periaiah B. Sc. (Hons) Ind. Chem. (UTM), M. Tech (Env. Mgmt.) (UM), DBA (Env. Mgmt) (IIUM), Director/Chemist MMIC Reg. No.: M/3186/4722/05/11
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ENVICHEM CONSULTS SDN. BHD (685031-V)

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Page 1 of 8

Customer	P2 Oil Sdn. Bhd.
Our Ref.	LD/0823/8611/02
Sample Received	25.08.2023
Sample Reported	04.09.2023
Sampling Date	24 th – 25 th August 2023

Station Monitored	Date Monitored	Time Monitored	LAeq (dBA)	LAmx (dBA)	LAmin (dBA)
N2	24 th August 2023 (Day time)	9:00:52	58.5	74.1	47.2
		9:05:52	60.0	76.2	53.7
		9:10:52	58.7	73.2	57.9
		9:15:52	60.0	76.9	58.1
		9:20:52	59.2	76.0	45.8
		9:25:52	59.0	78.9	57.7
		9:30:52	58.2	65.5	57.7
		9:35:52	58.3	76.5	57.5
		9:40:52	58.4	71.2	54.0
		9:45:52	58.4	75.0	57.7
		9:50:52	58.4	75.5	57.5
		9:55:52	58.4	75.6	57.6
		10:00:52	58.3	72.2	57.8
		10:05:52	58.2	68.8	57.5
		10:10:52	58.2	69.9	57.6
		10:15:52	58.2	65.7	58.1
		10:20:52	58.2	72.4	57.4
		10:25:52	58.4	73.8	57.8
		10:30:52	57.8	65.8	57.1
		10:35:52	57.8	65.2	57.3
		10:40:52	57.8	70.9	57.1
		10:45:52	58.0	73.6	57.1
		10:50:52	57.7	73.7	56.2
		10:55:52	59.5	78.4	55.9
		11:00:52	57.3	70.2	56.6
		11:05:52	57.0	67.4	55.9
		11:10:52	57.3	61.8	56.3
		11:15:52	58.1	71.0	56.7
		11:20:52	58.0	58.6	57.4
		11:25:52	58.6	71.2	57.5
		11:30:52	58.4	63.8	57.5
		11:35:52	58.2	64.7	57.4
		11:40:52	58.8	64.6	57.3
		11:45:52	59.1	74.1	57.9
		11:50:52	59.5	67.7	58.6
		11:55:52	60.1	75.6	58.0
		12:00:52	59.0	66.8	58.2
		12:05:52	59.1	63.9	58.4
		12:10:52	59.2	73.0	57.9
		12:15:52	58.9	66.6	58.1
		12:20:52	59.1	59.4	58.3
		12:25:52	58.7	76.1	57.7
		12:30:52	59.0	67.6	57.7
		12:35:52	60.9	64.1	58.2
		12:40:52	60.9	65.8	59.1

ENVICHEM CONSULTS SDN. BHD (685031-V)

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Customer	P2 Oil Sdn. Bhd.
Our Ref.	LD/0823/8611/02
Sample Received	25.08.2023
Sample Reported	04.09.2023
Sampling Date	24 th – 25 th August 2023

Station Monitored	Date Monitored	Time Monitored	LAeq (dBA)	LAmx (dBA)	LAmin (dBA)
N2	24 th August 2023 (Day time)	12:45:52	59.4	61.3	58.1
		12:50:52	59.4	74.9	58.2
		12:55:52	58.8	59.5	57.3
		13:00:52	58.9	59.5	58.3
		13:05:52	59.4	59.7	58.2
		13:10:52	59.0	59.6	58.1
		13:15:52	58.8	59.5	58.2
		13:20:52	58.3	67.2	57.6
		13:25:52	58.4	70.7	57.2
		13:30:52	58.0	74.6	57.4
		13:35:52	58.0	58.5	57.4
		13:40:52	57.6	58.3	57.2
		13:45:52	58.1	59.0	57.4
		13:50:52	58.8	59.2	58.5
		13:55:52	58.7	59.0	58.5
		14:00:52	58.5	59.0	58.3
		14:05:52	58.5	59.2	58.3
		14:10:52	58.2	58.5	57.3
		14:15:52	57.6	58.0	57.2
		14:20:52	58.2	58.8	57.3
		14:25:52	58.4	59.2	57.8
		14:30:52	58.3	59.5	57.7
		14:35:52	58.4	59.4	57.7
		14:40:52	58.8	59.4	57.8
		14:45:52	58.4	59.1	57.8
		14:50:52	58.5	59.1	57.8
		14:55:52	58.5	59.2	57.8
		15:00:52	59.1	59.4	58.4
		15:05:52	59.2	59.4	58.8
		15:10:52	59.3	59.4	58.2
		15:15:52	58.5	59.4	57.7
		15:20:52	57.7	58.1	57.5
		15:25:52	57.7	57.9	57.5
		15:30:52	57.6	57.8	57.0
		15:35:52	57.7	58.2	57.2
		15:40:52	58.0	59.0	57.4
		15:45:52	58.2	59.0	57.6
		15:50:52	58.0	58.9	57.4
		15:55:52	57.7	58.4	56.9
		16:00:52	57.9	58.2	57.3
		16:05:52	57.9	58.4	57.6
		16:10:52	57.9	58.3	57.4
		16:15:52	58.0	58.4	57.5
		16:20:52	57.2	58.5	55.3
		16:25:52	57.3	57.4	56.9

ENVICHEM CONSULTS SDN. BHD (685031-V)

No.5A-B, 7A-7B, Lorong Temenggung 15A, Taman Evergreen, 42900 Klang, Selangor Darul Ehsan.

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Customer	P2 Oil Sdn. Bhd.
Our Ref.	LD/0823/8611/02
Sample Received	25.08.2023
Sample Reported	04.09.2023
Sampling Date	24 th – 25 th August 2023

Station Monitored	Date Monitored	Time Monitored	LAeq (dBA)	LAmx (dBA)	LAmin (dBA)
N2	24 th August 2023 (Day time)	16:30:52	57.0	57.4	55.8
		16:35:52	57.3	57.8	56.9
		16:40:52	57.4	57.6	56.9
		16:45:52	57.4	57.6	56.7
		16:50:52	57.3	57.5	56.5
		16:55:52	57.3	57.4	57.0
		17:00:52	57.2	57.4	57.0
		17:05:52	57.2	57.8	56.5
		17:10:52	57.2	57.5	56.8
		17:15:52	57.2	57.5	56.7
		17:20:52	57.2	57.4	56.9
		17:25:52	57.1	57.4	56.7
		17:30:52	57.0	57.8	55.8
		17:35:52	57.1	57.3	56.3
		17:40:52	57.2	58.7	55.9
		17:45:52	62.8	64.2	58.8
		17:50:52	59.9	75.7	49.4
		17:55:52	61.0	64.5	58.8
		18:00:52	60.8	65.1	58.5
		18:05:52	58.9	70.1	57.6
		18:10:52	60.6	76.2	58.1
		18:15:52	59.8	78.9	58.1
		18:20:52	61.4	74.7	58.0
		18:25:52	62.4	73.1	58.7
		18:30:52	63.7	72.7	59.1
		18:35:52	65.1	73.7	60.8
		18:40:52	64.0	72.9	58.8
		18:45:52	64.2	77.2	60.6
		18:50:52	63.5	69.8	60.4
		18:55:52	63.4	71.9	60.1
		19:00:52	65.2	72.0	61.1
		19:05:52	63.6	71.7	59.7
		19:10:52	66.0	75.6	63.1
		19:15:52	65.4	73.5	62.2
		19:20:52	66.4	75.2	62.1
		19:25:52	65.4	74.3	62.0
		19:30:52	64.3	72.1	59.8
		19:35:52	63.1	67.5	59.8
		19:40:52	61.5	72.1	58.3
		19:45:52	61.6	76.4	59.0
		19:50:52	62.1	76.2	59.3
		19:55:52	62.8	71.3	59.2
		20:00:52	60.5	69.8	57.9
		20:05:52	58.6	65.0	57.8
		20:10:52	59.0	74.7	57.8

ENVICHEM CONSULTS SDN. BHD (685031-V)

No.5A-B, 7A-7B, Lorong Temenggung 15A, Taman Evergreen, 42900 Klang, Selangor Darul Ehsan.

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Customer	P2 Oil Sdn. Bhd.
Our Ref.	LD/0823/8611/02
Sample Received	25.08.2023
Sample Reported	04.09.2023
Sampling Date	24 th – 25 th August 2023

Station Monitored	Date Monitored	Time Monitored	LAeq (dBA)	LAmx (dBA)	LAmn (dBA)
N2	24 th August 2023 (Day time)	20:15:52	58.3	65.7	57.6
		20:20:52	58.4	67.9	57.4
		20:25:52	59.3	74.4	57.4
		20:30:52	61.1	71.3	57.9
		20:35:52	60.1	69.9	57.6
		20:40:52	58.7	75.1	57.6
		20:45:52	59.4	73.0	57.9
		20:50:52	58.4	72.0	57.8
		20:55:52	58.6	67.2	58.0
		21:00:52	58.5	58.8	58.2
		21:05:52	58.5	58.6	58.2
		21:10:52	58.5	59.2	58.2
		21:15:52	58.5	58.6	57.8
		21:20:52	58.3	58.6	58.0
		21:25:52	58.2	58.6	57.8
		21:30:52	58.1	58.7	57.7
		21:35:52	58.4	77.6	58.0
		21:40:52	58.1	58.3	57.9
		21:45:52	58.1	58.2	57.9
		21:50:52	57.9	58.9	57.5
	24 th August 2023 (Night time)	21:55:52	58.1	58.4	57.7
		22:00:52	58.2	58.4	57.8
		22:05:52	55.3	58.6	54.8
		22:10:52	55.3	58.5	55.2
		22:15:52	55.3	58.5	55.1
		22:20:52	55.4	58.6	55.2
		22:25:52	55.4	58.6	55.3
		22:30:52	55.3	58.5	55.1
		22:35:52	55.3	58.5	55.0
		22:40:52	55.3	58.5	55.1
		22:45:52	55.3	58.6	55.0
		22:50:52	55.2	59.7	54.9
		22:55:52	55.3	58.5	55.0
		23:00:52	55.2	58.4	55.0
		23:05:52	55.3	58.5	55.0
		23:10:52	55.3	58.4	55.0
		23:15:52	55.3	58.4	55.0
		23:20:52	55.2	58.4	54.8
		23:25:52	55.1	58.2	54.8
		23:30:52	55.0	58.4	54.8
		23:35:52	55.2	58.7	54.8
		23:40:52	55.8	59.4	55.1
		23:45:52	55.8	59.4	55.0
		23:50:52	56.2	59.4	55.0
		23:55:52	56.4	59.5	55.7

ENVICHEM CONSULTS SDN. BHD (685031-V)

No.5A-B, 7A-7B, Lorong Temenggung 15A, Taman Evergreen, 42900 Klang, Selangor Darul Ehsan.

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Customer	P2 Oil Sdn. Bhd.
Our Ref.	LD/0823/8611/02
Sample Received	25.08.2023
Sample Reported	04.09.2023
Sampling Date	24 th – 25 th August 2023

Station Monitored	Date Monitored	Time Monitored	LAeq (dBA)	LAmx (dBA)	LAmn (dBA)
N2	25 th August 2023 (Night time)	0:00:52	56.4	59.5	56.0
		0:05:52	56.3	59.4	55.4
		0:10:52	56.3	59.4	55.4
		0:15:52	56.2	59.5	55.2
		0:20:52	56.1	59.4	55.3
		0:25:52	56.0	59.4	55.0
		0:30:52	56.0	59.4	55.1
		0:35:52	56.1	59.4	55.3
		0:40:52	55.7	59.3	54.8
		0:45:52	55.3	59.1	54.6
		0:50:52	55.7	59.2	54.6
		0:55:52	55.2	59.2	54.4
		1:00:52	54.9	58.9	54.5
		1:05:52	54.7	58.2	54.4
		1:10:52	54.9	59.0	54.3
		1:15:52	54.6	57.7	54.1
		1:20:52	54.6	58.1	54.3
		1:25:52	54.6	57.8	54.1
		1:30:52	54.2	57.7	52.5
		1:35:52	53.9	57.1	53.5
		1:40:52	54.1	57.2	53.6
		1:45:52	54.0	57.3	53.6
		1:50:52	54.1	57.4	53.6
		1:55:52	54.0	57.4	53.5
		2:00:52	54.1	57.4	53.7
		2:05:52	54.1	57.4	53.8
		2:10:52	54.1	57.4	53.6
		2:15:52	54.1	57.5	53.7
		2:20:52	54.1	57.3	53.6
		2:25:52	54.1	57.3	53.7
		2:30:52	54.2	57.3	53.7
		2:35:52	54.2	57.3	53.7
		2:40:52	54.2	57.3	53.8
		2:45:52	54.2	57.2	53.7
		2:50:52	54.1	57.2	53.6
		2:55:52	54.1	57.2	53.6
		3:00:52	54.0	57.2	53.3
		3:05:52	54.0	57.5	53.4
		3:10:52	54.0	57.2	53.5
		3:15:52	54.3	57.5	53.8
		3:20:52	54.3	57.5	53.8
		3:25:52	54.3	57.4	53.9
		3:30:52	54.3	57.4	53.7
		3:35:52	54.3	57.4	53.8
		3:40:52	54.5	57.6	53.9

ENVICHEM CONSULTS SDN. BHD (685031-V)

No.5A-B, 7A-7B, Lorong Temenggung 15A, Taman Evergreen, 42900 Klang, Selangor Darul Ehsan.

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Customer	P2 Oil Sdn. Bhd.
Our Ref.	LD/0823/8611/02
Sample Received	25.08.2023
Sample Reported	04.09.2023
Sampling Date	24 th – 25 th August 2023

Station Monitored	Date Monitored	Time Monitored	LAeq (dBA)	LAmx (dBA)	LAmn (dBA)
N2	25 th August 2023 (Night time)	3:45:52	54.3	57.6	53.6
		3:50:52	54.3	57.6	53.8
		3:55:52	54.3	57.4	53.8
		4:00:52	54.3	57.4	53.9
		4:05:52	54.3	57.4	53.9
		4:10:52	54.3	57.4	53.9
		4:15:52	54.3	57.4	53.9
		4:20:52	54.5	57.8	53.8
		4:25:52	54.5	57.8	54.1
		4:30:52	54.8	74.0	43.5
		4:35:52	48.9	73.5	44.1
		4:40:52	47.4	64.5	44.1
		4:45:52	48.5	66.6	44.2
		4:50:52	47.4	65.6	44.0
		4:55:52	46.5	57.5	43.7
		5:00:52	46.4	58.2	44.1
		5:05:52	47.5	63.3	44.1
		5:10:52	48.1	66.2	44.1
		5:15:52	48.0	70.7	43.3
		5:20:52	46.6	64.5	43.6
		5:25:52	47.4	61.8	44.1
		5:30:52	48.6	68.1	44.1
		5:35:52	47.2	61.2	43.8
		5:40:52	47.7	68.8	43.9
		5:45:52	48.4	70.4	43.4
		5:50:52	46.4	60.9	43.0
		5:55:52	47.4	61.8	43.4
		6:00:52	58.9	70.2	44.0
		6:05:52	45.9	55.0	44.1
		6:10:52	51.4	63.7	44.6
		6:15:52	48.8	63.2	44.0
		6:20:52	45.8	54.8	43.7
		6:25:52	46.5	63.2	43.7
		6:30:52	50.6	66.0	43.1
		6:35:52	52.1	67.5	42.5
		6:40:52	46.6	63.7	42.5
		6:45:52	46.7	60.3	43.3
		6:50:52	50.8	73.8	43.7
		6:55:52	47.2	62.6	43.4
	25 th August 2023 (Day time)	7:00:52	45.8	56.8	43.5
		7:05:52	52.9	70.7	46.9
		7:10:52	49.4	60.8	46.4
		7:15:52	55.9	67.8	46.7
		7:20:52	51.6	69.7	46.5
		7:25:52	50.7	70.9	46.6

ENVICHEM CONSULTS SDN. BHD (685031-V)

No.5A-B, 7A-7B, Lorong Temenggung 15A, Taman Evergreen, 42900 Klang, Selangor Darul Ehsan.

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Customer	P2 Oil Sdn. Bhd.
Our Ref.	LD/0823/8611/02
Sample Received	25.08.2023
Sample Reported	04.09.2023
Sampling Date	24 th – 25 th August 2023

Station Monitored	Date Monitored	Time Monitored	LAeq (dBA)	LAmx (dBA)	LAmin (dBA)
N2	25 th August 2023 (Day time)	7:30:52	53.2	71.4	46.8
		7:35:52	52.1	67.8	46.5
		7:40:52	49.8	57.7	46.8
		7:45:52	49.6	59.8	46.4
		7:50:52	55.0	75.2	46.4
		7:55:52	49.1	59.0	46.6
		8:00:52	51.0	64.3	46.4
		8:05:52	49.0	57.3	46.5
		8:10:52	50.3	61.5	46.6
		8:15:52	50.1	68.5	45.6
		8:20:52	49.0	60.4	45.5
		8:25:52	50.1	61.2	46.6
		8:30:52	50.1	69.1	46.6
		8:35:52	49.6	59.1	46.7
		8:40:52	50.4	62.6	46.6
		8:45:52	49.9	60.4	46.8
		8:50:52	50.4	61.2	47.0
		8:55:52	51.3	71.3	46.9
		9:00:52	50.9	74.5	46.6

ENVICHEM CONSULTS SDN. BHD (685031-V)

No.5A-B, 7A-7B, Lorong Temenggung 15A, Taman Evergreen, 42900 Klang, Selangor Darul Ehsan.

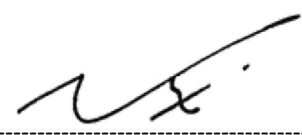
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Email: info@envichem.com.my Website: www.envichem.com.my

CERTIFICATE OF ANALYSIS

Customer	P2 Oil Sdn. Bhd.
Our Ref.	LD/0823/8611/02
Sample Received	25.08.2023
Sample Reported	04.09.2023
Sampling Date	24 th – 25 th August 2023

Sampling Point/ Time	LA _{eq} dB (A)	LA ₁₀ dB (A)	LA ₅₀ dB (A)	LA ₉₀ dB (A)	LA _{min} dB (A)	LA _{max} dB (A)	Recommended Limit LA _{eq} [dB (A)]	Comment
Point N2 Day time	58.1	61.6	58.4	51.6	45.5	78.9	60.0 dB(A) for Day time	Not Exceed
Point N2 Night time	53.0	55.9	54.3	47.2	42.5	74.0	55.0 dB(A) for Night time	Not Exceed

To: KESPRO CONSULTANTS SDN. BHD. For: P2 OIL SDN. BHD. Project: Proposed Pyrolysis Plant at Lot 225111, Jalan Gopeng, Tungzen Industrial park, Mukim Sungai Raya, 31300 Kampung Kepayang, Perak Darul Ridzuan, Malaysia.	Verified By,  Ts. ChM. Dr. Nagendran Periaiah <i>B. Sc. (Hons) Ind. Chem. (UTM), M. Tech (Env. Mgmt.) (UM), DBA (Env. Mgmt) (IIUM), Director/Chemist MMIC Reg. No.: M/3186/4722/05/11</i>
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Customer	P2 Oil Sdn. Bhd.
Our Ref.	LD/0823/8611/03
Sample Received	25.08.2023
Sample Reported	04.09.2023
Sampling Date	24 th – 25 th August 2023

Station Monitored	Date Monitored	Time Monitored	LAeq (dBA)	LAmx (dBA)	LAmin (dBA)
N3	24 th August 2023 (Day time)	9:35:14	76.0	78.1	73.1
		9:40:14	75.4	79.3	67.7
		9:45:14	73.5	77.1	68.4
		9:50:14	71.3	76.7	64.6
		9:55:14	70.6	80.5	65.0
		10:00:14	71.0	81.7	65.7
		10:05:14	71.9	76.6	61.0
		10:10:14	68.3	74.2	57.7
		10:15:14	65.3	72.2	53.8
		10:20:14	67.4	89.6	54.1
		10:25:14	61.5	71.7	53.9
		10:30:14	64.2	73.5	53.3
		10:35:14	66.4	76.1	53.8
		10:40:14	70.2	76.8	58.8
		10:45:14	68.3	76.9	53.1
		10:50:14	62.7	78.7	48.0
		10:55:14	66.8	77.4	53.9
		11:00:14	61.7	68.1	57.1
		11:05:14	59.0	78.5	48.1
		11:10:14	48.1	48.1	48.1
		11:15:14	48.1	48.1	48.1
		11:20:14	48.1	49.4	48.1
		11:25:14	48.1	48.1	48.1
		11:30:14	48.1	49.6	48.1
		11:35:14	48.4	52.6	48.1
		11:40:14	51.8	55.2	48.1
		11:45:14	58.8	81.4	48.1
		11:50:14	48.1	48.4	48.1
		11:55:14	48.2	48.2	48.1
		12:00:14	57.9	63.3	48.2
		12:05:14	53.4	61.0	48.3
		12:10:14	48.3	50.0	48.2
		12:15:14	48.3	48.3	48.3
		12:20:14	48.3	48.3	48.3
		12:25:14	48.3	48.3	48.3
		12:30:14	48.3	48.3	48.3
		12:35:14	48.3	49.0	48.3
		12:40:14	48.4	48.4	48.3
		12:45:14	48.4	49.1	48.4
		12:50:14	48.4	48.5	48.4
		12:55:14	48.4	48.4	48.4
		13:00:14	49.0	58.3	48.4
		13:05:14	48.5	51.0	48.4
		13:10:14	48.8	54.2	48.4
		13:15:14	48.7	51.0	48.5

ENVICHEM CONSULTS SDN. BHD (685031-V)

No.5A-B, 7A-7B, Lorong Temenggung 15A, Taman Evergreen, 42900 Klang, Selangor Darul Ehsan.

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Customer	P2 Oil Sdn. Bhd.
Our Ref.	LD/0823/8611/03
Sample Received	25.08.2023
Sample Reported	04.09.2023
Sampling Date	24 th – 25 th August 2023

Station Monitored	Date Monitored	Time Monitored	LAeq (dBA)	LAmx (dBA)	LAmin (dBA)
N3	24 th August 2023 (Day time)	13:20:14	48.6	49.9	48.5
		13:25:14	48.6	49.0	48.6
		13:30:14	48.6	50.1	48.6
		13:35:14	48.7	50.8	48.6
		13:40:14	48.6	49.3	48.6
		13:45:14	48.7	49.1	48.6
		13:50:14	48.8	54.4	48.7
		13:55:14	48.8	48.8	48.7
		14:00:14	48.8	49.5	48.8
		14:05:14	48.8	48.8	48.8
		14:10:14	48.9	48.9	48.8
		14:15:14	48.9	49.0	48.9
		14:20:14	49.0	49.0	49.0
		14:25:14	49.1	52.6	49.0
		14:30:14	49.1	49.1	49.0
		14:35:14	49.1	49.2	49.1
		14:40:14	49.2	50.4	49.2
		14:45:14	49.2	49.2	49.2
		14:50:14	49.3	49.3	49.2
		14:55:14	49.3	49.3	49.3
		15:00:14	49.3	49.3	49.3
		15:05:14	49.4	49.4	49.3
		15:10:14	49.4	49.4	49.4
		15:15:14	49.5	49.5	49.4
		15:20:14	49.5	49.5	49.5
		15:25:14	49.5	49.5	49.5
		15:30:14	49.5	49.5	49.5
		15:35:14	49.5	49.5	49.5
		15:40:14	49.6	49.6	49.5
		15:45:14	49.6	49.6	49.6
		15:50:14	49.6	49.6	49.6
		15:55:14	49.6	49.6	49.6
		16:00:14	49.6	49.6	49.6
		16:05:14	49.6	49.7	49.6
		16:10:14	49.7	49.7	49.7
		16:15:14	49.7	49.7	49.7
		16:20:14	49.7	49.7	49.7
		16:25:14	49.7	49.8	49.7
		16:30:14	49.7	49.7	49.7
		16:35:14	49.7	49.7	49.7
		16:40:14	49.7	49.7	49.7
		16:45:14	49.7	49.7	49.7
		16:50:14	49.7	49.7	49.7
		16:55:14	49.7	49.7	49.7
		17:00:14	49.7	49.7	49.7

Specialist in Environmental Monitoring & Testing Laboratory Services

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Customer	P2 Oil Sdn. Bhd.
Our Ref.	LD/0823/8611/03
Sample Received	25.08.2023
Sample Reported	04.09.2023
Sampling Date	24 th – 25 th August 2023

Station Monitored	Date Monitored	Time Monitored	LAeq (dBA)	LAmx (dBA)	LAmin (dBA)
N3	24 th August 2023 (Day time)	17:05:14	49.7	49.7	49.7
		17:10:14	49.8	53.3	49.7
		17:15:14	49.7	49.7	49.7
		17:20:14	49.7	49.7	49.7
		17:25:14	49.7	49.7	49.7
		17:30:14	49.7	49.7	49.7
		17:35:14	49.7	49.7	49.7
		17:40:14	49.7	49.7	49.7
		17:45:14	49.7	49.7	49.7
		17:50:14	49.7	49.7	49.7
		17:55:14	49.7	49.7	49.7
		18:00:14	49.7	49.7	49.7
		18:05:14	49.7	49.7	49.7
		18:10:14	49.7	49.7	49.7
		18:15:14	49.7	49.7	49.7
		18:20:14	49.7	49.7	49.7
		18:25:14	49.7	49.7	49.7
		18:30:14	49.7	49.7	49.7
		18:35:14	49.7	49.7	49.7
		18:40:14	49.7	49.7	49.7
		18:45:14	49.7	49.7	49.7
		18:50:14	49.7	49.7	49.7
		18:55:14	49.7	49.7	49.6
		19:00:14	49.6	49.6	49.6
		19:05:14	49.6	50.3	49.6
		19:10:14	49.6	49.6	49.6
		19:15:14	49.6	49.6	49.5
		19:20:14	49.5	49.6	49.5
		19:25:14	49.5	49.5	49.5
		19:30:14	49.5	49.5	49.5
		19:35:14	49.5	49.5	49.5
		19:40:14	49.5	49.5	49.5
		19:45:14	49.5	49.5	49.4
		19:50:14	49.4	51.7	49.4
		19:55:14	49.4	49.4	49.4
		20:00:14	49.4	49.4	49.3
		20:05:14	49.3	49.3	49.3
		20:10:14	49.3	49.3	49.3
		20:15:14	49.3	49.3	49.3
		20:20:14	49.3	49.3	49.3
		20:25:14	49.3	49.3	49.3
		20:30:14	49.3	49.4	49.2
		20:35:14	49.2	49.3	49.2
		20:40:14	49.2	49.2	49.2
		20:45:14	49.2	49.2	49.2

ENVICHEM CONSULTS SDN. BHD (685031-V)

No.5A-B, 7A-7B, Lorong Temenggung 15A, Taman Evergreen, 42900 Klang, Selangor Darul Ehsan.

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Customer	P2 Oil Sdn. Bhd.
Our Ref.	LD/0823/8611/03
Sample Received	25.08.2023
Sample Reported	04.09.2023
Sampling Date	24 th – 25 th August 2023

Station Monitored	Date Monitored	Time Monitored	LAeq (dBA)	LAmx (dBA)	LAmn (dBA)
N3	24 th August 2023 (Day time)	20:50:14	49.2	49.2	49.2
		20:55:14	49.2	49.2	49.2
		21:00:14	49.2	49.2	49.2
		21:05:14	49.1	49.2	49.1
		21:10:14	49.1	49.1	49.1
		21:15:14	49.1	49.1	49.1
		21:20:14	49.1	49.1	49.1
		21:25:14	49.0	49.1	49.0
		21:30:14	49.0	49.0	49.0
		21:35:14	49.0	49.0	49.0
		21:40:14	49.0	49.0	49.0
		21:45:14	49.0	49.0	49.0
		21:50:14	49.0	49.0	49.0
		21:55:14	49.0	49.0	49.0
	24 th August 2023 (Night time)	22:00:14	48.9	49.0	48.9
		22:05:14	48.9	48.9	46.9
		22:10:14	48.9	48.9	46.9
		22:15:14	48.9	48.9	46.9
		22:20:14	48.9	48.9	46.8
		22:25:14	48.8	48.8	46.8
		22:30:14	48.8	48.8	46.8
		22:35:14	48.8	48.8	46.8
		22:40:14	48.8	48.8	46.8
		22:45:14	48.8	48.8	46.8
		22:50:14	48.8	48.8	46.8
		22:55:14	48.8	49.4	46.8
		23:00:14	48.8	48.8	46.7
		23:05:14	48.7	48.7	46.7
		23:10:14	48.7	48.7	46.7
		23:15:14	48.7	48.7	46.7
	25 th August 2023 (Night time)	23:20:14	48.7	48.7	46.7
		23:25:14	48.7	48.7	46.6
		23:30:14	48.6	48.6	46.6
		23:35:14	48.6	48.6	46.6
		23:40:14	48.6	48.6	46.6
		23:45:14	48.6	48.6	46.6
		23:50:14	48.6	48.6	46.6
		23:55:14	48.6	48.6	46.6
		0:00:14	48.6	48.6	46.6
		0:05:14	48.6	48.6	46.6
		0:10:14	48.6	48.6	46.6
		0:15:14	48.6	48.6	46.5
		0:20:14	48.5	48.5	46.5
		0:25:14	48.5	48.5	46.5
		0:30:14	48.5	48.5	46.5

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Customer	P2 Oil Sdn. Bhd.
Our Ref.	LD/0823/8611/03
Sample Received	25.08.2023
Sample Reported	04.09.2023
Sampling Date	24 th – 25 th August 2023

Station Monitored	Date Monitored	Time Monitored	LAeq (dBA)	LAmx (dBA)	LAmn (dBA)
N3	25 th August 2023 (Night time)	0:35:14	48.5	48.5	46.5
		0:40:14	48.5	49.3	46.5
		0:45:14	48.5	48.5	46.4
		0:50:14	48.4	48.4	46.4
		0:55:14	48.4	48.4	46.4
		1:00:14	48.4	48.4	46.4
		1:05:14	48.4	48.4	46.4
		1:10:14	48.4	48.4	46.4
		1:15:14	48.4	48.4	46.4
		1:20:14	48.4	48.4	46.4
		1:25:14	48.4	48.4	46.4
		1:30:14	48.4	48.4	46.4
		1:35:14	48.4	48.4	46.4
		1:40:14	48.4	48.4	46.4
		1:45:14	48.3	48.4	46.3
		1:50:14	48.3	48.3	46.3
		1:55:14	48.3	48.3	46.3
		2:00:14	48.3	48.3	46.3
		2:05:14	48.3	48.3	46.3
		2:10:14	48.3	48.3	46.3
		2:15:14	48.3	48.3	46.3
		2:20:14	48.3	48.3	46.3
		2:25:14	48.3	48.3	46.3
		2:30:14	48.3	48.3	46.3
		2:35:14	48.3	48.3	46.3
		2:40:14	48.3	48.3	46.3
		2:45:14	48.3	48.3	46.3
		2:50:14	48.3	48.3	46.3
		2:55:14	48.3	48.3	46.3
		3:00:14	48.3	48.3	46.2
		3:05:14	48.2	48.3	46.2
		3:10:14	48.2	48.2	46.2
		3:15:14	48.2	48.2	46.2
		3:20:14	48.2	48.2	46.2
		3:25:14	48.2	48.2	46.2
		3:30:14	48.2	48.2	46.2
		3:35:14	48.2	48.2	46.2
		3:40:14	48.2	48.2	46.2
		3:45:14	48.2	48.2	46.2
		3:50:14	48.1	48.2	46.1
		3:55:14	48.1	48.1	46.1
		4:00:14	48.1	48.1	46.1
		4:05:14	48.1	48.1	46.1
		4:10:14	48.1	48.1	46.1
		4:15:14	48.1	48.1	46.1

ENVICHEM CONSULTS SDN. BHD (685031-V)

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Page 6 of 8

Customer	P2 Oil Sdn. Bhd.
Our Ref.	LD/0823/8611/03
Sample Received	25.08.2023
Sample Reported	04.09.2023
Sampling Date	24 th – 25 th August 2023

Station Monitored	Date Monitored	Time Monitored	LAeq (dBA)	LAmx (dBA)	LAmn (dBA)
N3	25 th August 2023 (Night time)	4:20:14	48.1	48.1	46.1
		4:25:14	48.1	48.1	46.1
		4:30:14	48.1	48.1	46.1
		4:35:14	48.1	48.1	46.1
		4:40:14	48.1	48.1	46.1
		4:45:14	48.1	48.1	46.1
		4:50:14	48.1	48.2	46.1
		4:55:14	48.1	48.1	46.1
		5:00:14	48.1	48.1	46.1
		5:05:14	48.1	48.1	46.1
		5:10:14	48.1	48.1	46.1
		5:15:14	48.1	48.1	46.0
		5:20:14	48.0	48.0	46.0
		5:25:14	48.0	48.0	46.0
		5:30:14	48.0	48.0	46.0
		5:35:14	48.0	48.0	46.0
		5:40:14	48.0	48.0	46.0
		5:45:14	48.0	48.0	46.0
		5:50:14	48.0	48.0	46.0
		5:55:14	48.0	48.9	46.0
		6:00:14	48.0	48.0	46.0
		6:05:14	48.0	48.0	46.0
		6:10:14	48.0	48.0	45.9
		6:15:14	47.9	48.0	45.9
		6:20:14	47.9	47.9	45.9
		6:25:14	48.0	51.3	45.9
		6:30:14	48.4	57.1	45.9
		6:35:14	47.9	47.9	45.9
		6:40:14	47.9	47.9	45.9
		6:45:14	48.3	54.7	45.9
		6:50:14	47.9	47.9	45.9
		6:55:14	47.9	48.7	45.9
	25 th August 2023 (Day time)	7:00:14	48.0	50.9	45.9
		7:05:14	47.9	47.9	47.9
		7:10:14	47.9	47.9	47.9
		7:15:14	48.0	51.7	47.9
		7:20:14	48.0	48.4	47.9
		7:25:14	48.0	54.1	47.9
		7:30:14	47.9	48.0	47.9
		7:35:14	48.0	51.6	47.9
		7:40:14	47.9	49.6	47.9
		7:45:14	47.9	47.9	47.9
		7:50:14	47.9	48.0	47.9
		7:55:14	48.0	50.8	47.9
		8:00:14	49.1	60.7	47.9

ENVICHEM CONSULTS SDN. BHD (685031-V)

No.5A-B, 7A-7B, Lorong Temenggung 15A, Taman Evergreen, 42900 Klang, Selangor Darul Ehsan.

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Page 7 of 8

Customer	P2 Oil Sdn. Bhd.
Our Ref.	LD/0823/8611/03
Sample Received	25.08.2023
Sample Reported	04.09.2023
Sampling Date	24 th – 25 th August 2023

Station Monitored	Date Monitored	Time Monitored	LAeq (dBA)	LAmx (dBA)	LAmin (dBA)
N3	25 th August 2023 (Day time)	8:05:14	47.9	48.7	47.9
		8:10:14	49.5	58.4	47.9
		8:15:14	48.1	50.7	47.9
		8:20:14	48.1	51.2	47.9
		8:25:14	48.3	51.7	47.9
		8:30:14	48.2	51.2	47.9
		8:35:14	48.2	57.6	47.9
		8:40:14	50.0	60.7	47.9
		8:45:14	47.9	48.0	47.9
		8:50:14	47.9	47.9	47.9
		8:55:14	47.9	47.9	47.9
		9:00:14	47.9	48.4	47.9
		9:05:14	48.0	51.2	47.9
		9:10:14	47.9	49.5	47.9
		9:15:14	51.1	63.4	47.9
		9:20:14	51.4	63.9	48.0
		9:25:14	50.9	63.3	48.0
		9:30:14	49.3	55.7	48.0
		9:35:14	49.6	57.4	48.0

ENVICHEM CONSULTS SDN. BHD (685031-V)

No.5A-B, 7A-7B, Lorong Temenggung 15A, Taman Evergreen, 42900 Klang, Selangor Darul Ehsan.

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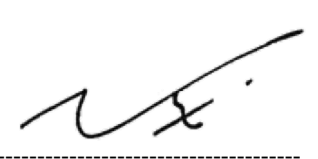
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CERTIFICATE OF ANALYSIS

Page 8 of 8

Customer	P2 Oil Sdn. Bhd.
Our Ref.	LD/0823/8611/03
Sample Received	25.08.2023
Sample Reported	04.09.2023
Sampling Date	24 th – 25 th August 2023

Sampling Point/ Time	LA _{eq} dB (A)	LA ₁₀ dB (A)	LA ₅₀ dB (A)	LA ₉₀ dB (A)	LA _{min} dB (A)	LA _{max} dB (A)	Recommended Limit LA _{eq} [dB (A)]	Comment
Point N3 Day time	51.2	59.0	49.3	48.1	47.9	89.6	60.0 dB(A) for Day time	Not Exceed
Point N3 Night time	48.3	48.8	48.3	48.0	47.9	57.1	55.0 dB(A) for Night time	Not Exceed

To: KESPRO CONSULTANTS SDN. BHD. For: P2 OIL SDN. BHD. Project: Proposed Pyrolysis Plant at Lot 225111, Jalan Gopeng, Tungzen Industrial park, Mukim Sungai Raya, 31300 Kampung Kepayang, Perak Darul Ridzuan, Malaysia.	Verified By,  Ts. ChM. Dr. Nagendran Periaiah <i>B. Sc. (Hons) Ind. Chem. (UTM), M. Tech (Env. Mgmt.) (UM), DBA (Env. Mgmt) (IIUM), Director/Chemist MMIC Reg. No.: M/3186/4722/05/11</i>
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ENVICHEM CONSULTS SDN. BHD (685031-V)

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Customer	P2 Oil Sdn. Bhd.
Our Ref.	LD/0823/8611/04
Sample Received	25.08.2023
Sample Reported	04.09.2023
Sampling Date	24 th – 25 th August 2023

Station Monitored	Date Monitored	Time Monitored	LAeq (dBA)	LAmx (dBA)	LAmin (dBA)
N4	24 th August 2023 (Day time)	10:40:14	61.7	78.1	52.3
		10:45:14	61.0	78.0	50.0
		10:50:14	69.7	93.0	50.8
		10:55:14	55.6	72.3	51.1
		11:00:14	59.0	68.6	50.3
		11:05:14	58.9	75.4	50.2
		11:10:14	57.5	74.5	50.9
		11:15:14	56.6	75.3	50.6
		11:20:14	58.0	67.8	50.5
		11:25:14	52.7	56.5	51.2
		11:30:14	58.2	68.6	50.2
		11:35:14	58.1	77.6	51.1
		11:40:14	58.1	71.9	50.7
		11:45:14	64.7	87.8	50.1
		11:50:14	61.6	70.2	51.3
		11:55:14	57.7	67.8	51.8
		12:00:14	53.0	56.0	51.4
		12:05:14	57.4	76.9	51.4
		12:10:14	53.7	59.9	51.7
		12:15:14	59.2	79.7	51.4
		12:20:14	61.0	78.2	51.7
		12:25:14	69.7	74.7	55.5
		12:30:14	70.1	73.5	65.1
		12:35:14	65.2	70.1	55.4
		12:40:14	61.1	78.6	48.0
		12:45:14	48.1	50.6	48.0
		12:50:14	55.4	65.7	48.0
		12:55:14	48.1	50.1	48.0
		13:00:14	48.2	51.7	48.0
		13:05:14	48.4	54.9	48.1
		13:10:14	57.8	72.2	48.1
		13:15:14	56.6	70.0	53.6
		13:20:14	62.2	79.0	48.4
		13:25:14	48.7	56.5	48.4
		13:30:14	48.7	52.7	48.4
		13:35:14	48.6	51.8	48.5
		13:40:14	49.0	60.7	48.6
		13:45:14	48.6	49.9	48.6
		13:50:14	48.8	53.2	48.6
		13:55:14	48.8	51.3	48.7
		14:00:14	48.8	49.5	48.8
		14:05:14	48.8	51.4	48.8
		14:10:14	49.1	53.7	48.8
		14:15:14	49.1	55.0	48.9
		14:20:14	49.2	52.6	49.0

ENVICHEM CONSULTS SDN. BHD (685031-V)

No.5A-B, 7A-7B, Lorong Temenggung 15A, Taman Evergreen, 42900 Klang, Selangor Darul Ehsan.

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Customer	P2 Oil Sdn. Bhd.
Our Ref.	LD/0823/8611/04
Sample Received	25.08.2023
Sample Reported	04.09.2023
Sampling Date	24 th – 25 th August 2023

Station Monitored	Date Monitored	Time Monitored	LAeq (dBA)	LAmx (dBA)	LAmin (dBA)
N4	24 th August 2023 (Day time)	14:25:14	49.3	54.8	49.0
		14:30:14	49.1	49.8	49.0
		14:35:14	49.2	51.5	49.1
		14:40:14	49.2	51.7	49.1
		14:45:14	49.2	51.4	49.2
		14:50:14	49.3	51.0	49.2
		14:55:14	50.8	63.9	49.2
		15:00:14	49.4	53.3	49.3
		15:05:14	49.3	49.8	49.3
		15:10:14	49.4	51.3	49.3
		15:15:14	49.4	49.5	49.3
		15:20:14	49.9	61.8	49.4
		15:25:14	49.4	50.1	49.4
		15:30:14	49.6	53.2	49.5
		15:35:14	49.5	50.4	49.5
		15:40:14	49.5	50.7	49.5
		15:45:14	49.5	50.1	49.5
		15:50:14	49.6	49.9	49.5
		15:55:14	49.7	53.2	49.6
		16:00:14	49.6	52.2	49.6
		16:05:14	49.7	52.0	49.6
		16:10:14	49.7	50.9	49.7
		16:15:14	49.7	51.2	49.7
		16:20:14	49.9	57.5	49.7
		16:25:14	49.7	51.9	49.7
		16:30:14	49.7	50.4	49.7
		16:35:14	49.7	50.8	49.7
		16:40:14	49.8	51.5	49.7
		16:45:14	50.0	56.7	49.8
		16:50:14	49.8	51.1	49.8
		16:55:14	49.9	55.2	49.8
		17:00:14	50.0	54.6	49.8
		17:05:14	49.8	51.3	49.8
		17:10:14	49.9	54.7	49.8
		17:15:14	49.8	50.5	49.8
		17:20:14	49.8	50.1	49.8
		17:25:14	49.9	51.6	49.8
		17:30:14	49.8	51.6	49.8
		17:35:14	49.8	50.8	49.8
		17:40:14	49.9	51.2	49.8
		17:45:14	50.0	52.4	49.8
		17:50:14	49.8	50.3	49.8
		17:55:14	49.9	52.1	49.8
		18:00:14	49.9	53.8	49.8
		18:05:14	49.8	51.8	49.7

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Customer	P2 Oil Sdn. Bhd.
Our Ref.	LD/0823/8611/04
Sample Received	25.08.2023
Sample Reported	04.09.2023
Sampling Date	24 th – 25 th August 2023

Station Monitored	Date Monitored	Time Monitored	LAeq (dBA)	LAmx (dBA)	LAmin (dBA)
N4	24 th August 2023 (Day time)	18:10:14	49.8	52.9	49.7
		18:15:14	49.8	50.7	49.7
		18:20:14	49.8	51.2	49.7
		18:25:14	49.7	51.4	49.7
		18:30:14	49.7	52.1	49.7
		18:35:14	49.7	50.9	49.7
		18:40:14	60.1	70.6	49.6
		18:45:14	50.6	59.0	49.6
		18:50:14	50.8	62.0	49.5
		18:55:14	51.8	60.5	49.5
		19:00:14	50.4	55.5	49.5
		19:05:14	51.0	55.4	49.5
		19:10:14	61.3	75.5	49.7
		19:15:14	59.1	77.9	51.5
		19:20:14	60.9	78.6	52.4
		19:25:14	52.9	55.0	52.2
		19:30:14	52.9	54.8	52.1
		19:35:14	52.9	53.7	52.2
		19:40:14	52.9	53.8	52.1
		19:45:14	53.0	53.8	52.3
		19:50:14	53.2	54.4	52.4
		19:55:14	53.2	53.9	52.4
		20:00:14	53.1	54.0	52.0
		20:05:14	53.3	55.5	52.4
		20:10:14	52.9	53.6	52.0
		20:15:14	52.7	54.6	51.8
		20:20:14	52.8	57.8	51.6
		20:25:14	52.9	53.8	52.1
		20:30:14	52.9	54.2	52.0
		20:35:14	52.9	53.9	52.2
		20:40:14	52.9	53.7	52.1
		20:45:14	52.7	53.6	51.9
		20:50:14	52.9	61.4	51.9
		20:55:14	52.9	54.1	51.9
		21:00:14	53.0	53.7	52.2
		21:05:14	52.7	54.0	51.9
		21:10:14	52.9	55.4	52.0
		21:15:14	53.2	58.1	52.2
		21:20:14	53.2	53.9	52.6
		21:25:14	53.1	54.4	52.2
		21:30:14	52.8	53.6	52.1
		21:35:14	52.6	53.6	51.6
		21:40:14	52.5	53.2	51.7
		21:45:14	52.6	53.4	51.9
		21:50:14	52.4	53.3	51.5

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Customer	P2 Oil Sdn. Bhd.
Our Ref.	LD/0823/8611/04
Sample Received	25.08.2023
Sample Reported	04.09.2023
Sampling Date	24 th – 25 th August 2023

Station Monitored	Date Monitored	Time Monitored	LAeq (dBA)	LAmx (dBA)	LAmn (dBA)
N4	24 th August 2023 (Night time)	21:55:14	52.6	53.5	51.9
		22:00:14	52.6	53.8	51.7
		22:05:14	52.7	54.1	49.8
		22:10:14	52.5	53.6	49.7
		22:15:14	52.6	53.4	49.8
		22:20:14	52.7	53.5	49.8
		22:25:14	52.8	53.6	50.1
		22:30:14	52.6	53.5	49.7
		22:35:14	52.8	54.6	49.9
		22:40:14	52.7	53.9	50.0
		22:45:14	52.7	53.7	50.0
		22:50:14	52.7	53.6	49.9
		22:55:14	52.7	53.9	49.9
		23:00:14	52.7	53.7	49.7
		23:05:14	52.7	53.4	49.7
		23:10:14	52.8	53.5	50.3
		23:15:14	52.9	53.6	50.1
		23:20:14	52.6	53.9	49.9
		23:25:14	52.7	53.4	49.9
		23:30:14	52.6	53.2	50.0
		23:35:14	52.5	53.2	49.8
		23:40:14	52.7	53.5	50.0
		23:45:14	52.7	55.5	49.9
		23:50:14	52.5	53.5	49.8
		23:55:14	52.7	53.5	50.0
	25 th August 2023 (Night time)	0:00:14	52.8	53.6	50.0
		0:05:14	52.5	53.2	49.8
		0:10:14	52.6	53.6	49.8
		0:15:14	52.6	53.2	49.7
		0:20:14	52.6	53.9	49.8
		0:25:14	52.6	53.4	49.9
		0:30:14	52.6	53.4	49.9
		0:35:14	52.7	53.5	50.0
		0:40:14	52.9	54.1	50.2
		0:45:14	52.9	53.7	50.1
		0:50:14	52.8	53.5	50.2
		0:55:14	52.6	53.2	50.0
		1:00:14	52.6	53.5	49.8
		1:05:14	52.8	53.6	50.1
		1:10:14	52.1	53.7	46.5
		1:15:14	48.5	50.1	46.5
		1:20:14	48.5	48.5	46.5
		1:25:14	48.5	48.5	46.5
		1:30:14	48.5	48.5	46.5
		1:35:14	52.2	53.6	46.5

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Customer	P2 Oil Sdn. Bhd.
Our Ref.	LD/0823/8611/04
Sample Received	25.08.2023
Sample Reported	04.09.2023
Sampling Date	24 th – 25 th August 2023

Station Monitored	Date Monitored	Time Monitored	LAeq (dBA)	LAmx (dBA)	LAmn (dBA)
N4	25 th August 2023 (Night time)	1:40:14	52.9	53.5	50.2
		1:45:14	52.8	53.6	50.1
		1:50:14	52.8	53.5	50.1
		1:55:14	52.5	53.5	46.4
		2:00:14	48.4	48.4	46.4
		2:05:14	48.4	48.4	46.4
		2:10:14	48.4	48.4	46.4
		2:15:14	48.4	48.4	46.4
		2:20:14	48.4	48.4	46.4
		2:25:14	48.4	49.2	46.4
		2:30:14	48.4	48.4	46.4
		2:35:14	48.4	48.4	46.4
		2:40:14	48.4	48.4	46.4
		2:45:14	48.4	48.4	46.4
		2:50:14	48.4	48.4	46.4
		2:55:14	48.4	48.4	46.4
		3:00:14	48.4	48.4	46.3
		3:05:14	48.4	51.3	46.3
		3:10:14	48.3	48.3	46.3
		3:15:14	48.3	48.3	46.3
		3:20:14	48.3	48.3	46.3
		3:25:14	48.3	48.3	46.3
		3:30:14	48.3	48.3	46.3
		3:35:14	48.3	50.0	46.3
		3:40:14	48.3	48.3	46.3
		3:45:14	48.3	48.3	46.3
		3:50:14	48.3	48.3	46.3
		3:55:14	48.3	48.3	46.3
		4:00:14	48.3	50.1	46.3
		4:05:14	48.3	48.3	46.3
		4:10:14	48.3	48.3	46.3
		4:15:14	48.3	48.3	46.3
		4:20:14	48.3	48.3	46.3
		4:25:14	48.3	48.3	46.3
		4:30:14	48.3	48.4	46.3
		4:35:14	48.3	48.3	46.2
		4:40:14	48.2	48.3	46.2
		4:45:14	48.2	48.2	46.2
		4:50:14	48.2	48.2	46.2
		4:55:14	48.2	48.2	46.2
		5:00:14	48.2	48.2	46.2
		5:05:14	48.2	48.2	46.2
		5:10:14	48.2	48.2	46.2
		5:15:14	48.2	48.2	46.2
		5:20:14	48.2	48.3	46.2

ENVICHEM CONSULTS SDN. BHD (685031-V)

No.5A-B, 7A-7B, Lorong Temenggung 15A, Taman Evergreen, 42900 Klang, Selangor Darul Ehsan.

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Customer	P2 Oil Sdn. Bhd.
Our Ref.	LD/0823/8611/04
Sample Received	25.08.2023
Sample Reported	04.09.2023
Sampling Date	24 th – 25 th August 2023

Station Monitored	Date Monitored	Time Monitored	LAeq (dBA)	LAmx (dBA)	LAmn (dBA)
N4	25 th August 2023 (Night time)	5:25:14	48.2	48.2	46.2
		5:30:14	48.2	48.2	46.1
		5:35:14	48.1	48.1	46.1
		5:40:14	48.1	49.0	46.1
		5:45:14	48.1	48.2	46.1
		5:50:14	48.3	54.1	46.1
		5:55:14	48.2	48.4	46.1
		6:00:14	48.2	48.4	46.1
		6:05:14	48.2	49.2	46.1
		6:10:14	48.2	48.5	46.1
		6:15:14	48.2	48.5	46.1
		6:20:14	48.2	48.8	46.1
		6:25:14	48.2	48.6	46.1
		6:30:14	48.1	48.4	46.1
		6:35:14	48.2	49.2	46.1
		6:40:14	48.2	49.4	46.1
		6:45:14	48.2	48.8	46.1
		6:50:14	48.2	49.4	46.1
		6:55:14	48.2	48.9	46.1
	25 th August 2023 (Day time)	7:00:14	48.2	49.1	46.1
		7:05:14	48.3	50.7	48.1
		7:10:14	48.3	49.5	48.1
		7:15:14	48.3	49.3	48.1
		7:20:14	48.3	51.2	48.0
		7:25:14	48.5	56.2	48.0
		7:30:14	48.2	51.8	48.0
		7:35:14	48.2	48.5	48.0
		7:40:14	48.2	49.0	48.0
		7:45:14	48.2	49.0	48.0
		7:50:14	48.4	52.3	48.0
		7:55:14	49.1	52.4	48.0
		8:00:14	48.8	50.9	48.2
		8:05:14	49.0	50.8	48.2
		8:10:14	49.1	50.0	48.3
		8:15:14	49.2	53.0	48.3
		8:20:14	49.2	50.9	48.3
		8:25:14	49.2	52.0	48.1
		8:30:14	48.4	51.6	48.0
		8:35:14	48.5	54.0	48.0
		8:40:14	48.4	49.0	48.1
		8:45:14	48.9	55.0	48.0
		8:50:14	48.3	49.0	48.0
		8:55:14	48.5	50.8	48.1
		9:00:14	70.2	87.4	48.0
		9:05:14	66.2	81.7	56.5

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Customer	P2 Oil Sdn. Bhd.
Our Ref.	LD/0823/8611/04
Sample Received	25.08.2023
Sample Reported	04.09.2023
Sampling Date	24 th – 25 th August 2023

Station Monitored	Date Monitored	Time Monitored	LAeq (dBA)	LAmx (dBA)	LAmin (dBA)
N4	25 th August 2023 (Day time)	9:10:14	70.1	75.9	53.0
		9:15:14	72.0	75.7	59.3
		9:20:14	72.7	76.6	65.9
		9:25:14	65.8	79.2	53.8
		9:30:14	70.6	91.6	53.4
		9:35:14	66.6	88.5	53.4
		9:40:14	71.2	82.6	48.9
		9:45:14	75.6	80.1	70.0
		9:50:14	75.8	79.9	71.0
		9:55:14	77.9	81.2	74.8
		10:00:14	75.2	79.4	66.5
		10:05:14	74.9	83.3	70.6
		10:10:14	74.4	77.5	71.6
		10:15:14	74.3	79.1	70.5
		10:20:14	75.7	78.8	70.6
		10:25:14	74.6	79.1	69.2
		10:30:14	76.6	80.9	74.1
		10:35:14	75.8	78.5	72.4
		10:40:14	77.3	80.7	73.2

ENVICHEM CONSULTS SDN. BHD (685031-V)

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CERTIFICATE OF ANALYSIS

Customer	P2 Oil Sdn. Bhd.
Our Ref.	LD/0823/8611/04
Sample Received	25.08.2023
Sample Reported	04.09.2023
Sampling Date	24 th – 25 th August 2023

Sampling Point/ Time	LA _{eq} dB (A)	LA ₁₀ dB (A)	LA ₅₀ dB (A)	LA ₉₀ dB (A)	LA _{min} dB (A)	LA _{max} dB (A)	Recommended Limit LA _{eq} [dB (A)]	Comment
Point N4 Day time	54.6	70.1	50.6	48.5	48.0	93.0	70.0 dB(A) for Day time	Not Exceed
Point N4 Night time	50.0	52.8	48.4	48.2	46.1	55.5	65.0 dB(A) for Night time	Not Exceed

To: KESPRO CONSULTANTS SDN. BHD. For: P2 OIL SDN. BHD. Project: Proposed Pyrolysis Plant at Lot 225111, Jalan Gopeng, Tungzen Industrial park, Mukim Sungai Raya, 31300 Kampung Kepayang, Perak Darul Ridzuan, Malaysia.	Verified By,  Ts. ChM. Dr. Nagendran Periaiah B. Sc. (Hons) Ind. Chem. (UTM), M. Tech (Env. Mgmt.) (UM), DBA (Env. Mgmt) (IIUM), Director/Chemist MMIC Reg. No.: M/3186/4722/05/11
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MONITORING PHOTOGRAPHS



N1: Project Boundary



N2: Nearest Shophouse at Taman Seri Raia



N3: Nearest House at Kg Tekkah



N4: Entrance at Auasia Nutriculture (Agro Based Industry)

P2 OIL SDN. BHD.



AMBIENT AIR QUALITY MONITORING – PLAN LAYOUT

Site Description: -

N1: Project Boundary

N2: Nearest Shophouse at Taman Seri Raia

N3: Nearest House at Kg Tekkah

N4: Entrance at Auasia Nutriculture (Agro Based Industry)

Prepared by:

KESPRO CONSULTANTS SDN. BHD.

Prepared for:

P2 OIL SDN. BHD.

APPENDIX 6.4
CERTIFICATE OF ANALYSIS (GROUNDWATER QUALITY)



EnviChem



REG5/JA/1676
Certified ISO 14001



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CERTIFICATE OF ANALYSIS

Page 1 of 1

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^^Customer	P2 OIL SDN. BHD.		
Lab Report No.	LP/1223/8898		
Date Sample Received	29.12.2023		
Date Sample Reported	05.01.2024		
Sample Description	Groundwater/Solution		
Sample Marking	GW1		
TEST PARAMETER	METHODS	RESULTS	*MGWQSI (2019)
Temperature, °C	APHA 2550 B	28.7°C	Normal ± 2 °C
pH	APHA 4500 H ⁺ B	7.05	5.5-9.0
Dissolved Oxygen, mg/l	APHA 4500 O-G	4.0	-
Total Suspended Solids, mg/l	APHA 2540 D	10	-
Conductivity, µS/cm	In-House Method EC-SM-023 based on APHA 2510 B	249.6	1000
^Chloride, mg/l	APHA 4500 Cl ⁻ C	31	250
^Turbidity, NTU	APHA 2130 B	7.50	1000
Mercury (Hg), mg/l	APHA 3112 B (modified)	ND(<0.002)	0.001
Cadmium (Cd), mg/l	APHA 3111 B	ND(<0.002)	0.003
Chromium (Cr), mg/l	APHA 3111 B	ND(<0.02)	0.05
Arsenic (As), mg/l	APHA 3114 B (modified)	ND(<0.003)	0.01
Cyanide (CN), mg/l	In- House Method EC-SM-020, based on APHA 4500- CN-E	0.03	0.07
Lead (Pb), mg/l	APHA 3111 B	0.01	0.05
Copper (Cu), mg/l	APHA 3111 B	ND(<0.03)	1.0
Manganese (Mn), mg/l	APHA 3111 B	0.20	0.2
Magnesium (Mg), mg/l	APHA 3111 B	1.35	150
Nickel (Ni), mg/l	APHA 3111 B	0.01	0.04
Zinc (Zn), mg/l	APHA 3111 B	ND(<0.01)	3.0
Iron (Fe), mg/l	APHA 3111 B	0.14	1.0
Selenium (Se), mg/l	APHA 3114 B	ND (<0.001)	0.01
Fluoride, mg/l	APHA 4500 F ⁻ D	ND (<0.05)	1.5
^Hardness, mg/l	APHA 2340 C	35.5	500
Argentum (Ag), mg/l	APHA 3111 B	ND(<0.01)	0.05
Ammoniacal Nitrogen, mg/l	APHA 4500 NH ₃ - B,F	0.38	1.5
Nitrite Nitrogen, mg/l	In-House Method EC-SM-030, based on APHA 4500 NO ₂ ⁻ B	0.36	0.4
^Nitrate Nitrogen, mg/l	In-House Method EC-SM-037, based on APHA 4500 NO ₃ ⁻ E	8	10
Phenol, mg/l	APHA 5530 B,D	ND(<0.001)	0.002
^Sodium, mg/l	APHA 3111 B	0.94	200
^Sulphate, mg/l	APHA 4500 SO ₄ ²⁻ C	0.72	250
Oil & Grease, mg/l	APHA 5520 B	ND(<0.01)	0.3
Note: 1) ND means Not Detected 2) APHA means Standard Method for the Examination of Water and Wastewater (American Public Health Association), 21st Edition 2005 3) MGWQSI means Malaysia Ground Water Quality Standard Index 4) * means Standard Limit requested by customer 5) ^ means Not Accredited 6) ^^ means sample was collected and sent to laboratory by customer			
To: KESPRO CONSULTANTS SDN. BHD. For: P2 OIL SDN. BHD.		Verified By, Ts. ChM. Dr. Nagendran Periaiah B. Sc. (Hons) Ind. Chem. (UTM), M. Tech (Env. Mgmt.) (UM), DBA (Env. Mgmt.) (IIUM), Director/Chemist MMIC Reg. No.: M/3186/4722/05/11	

The above results relate only to the items tested. This report shall not be reproduced except in full without the written approval of EnviChem Consults Sdn. Bhd.

APPENDIX 6.5

SOIL INVESTIGATION WORKS REPORT

WELL PROJECT(EIA) AT IPOH PERAK

FINAL REPORT

SI-Contractor :

WAZAMA ENTERPRISE

F-15-1B, Jalan Prima Saujana 2C,
Taman Prima Saujana,
43000 Kajang,
Selangor Darul Ehsan

Environment Consultant :

KESPRO CONSULTANT SDN BHD

No. A-07-09, Sunway Geo Avenue,
Jalan Lagoon Selatan,
47500 Subang Jaya, Selangor

SOIL INVESTIGATION WORKS:

PROJECT: WELL PROJECT (EIA) AT IPOH, PERAK.

CONTENTS

1. INTRODUCTION
2. BORING LOG
3. PHOTO
4. LOCATION PLAN

1.0 INTRODUCTION

This report presents the results of the subsurface exploration carried out for Well Project (EIA) at Ipoh, Perak

The field works (15-12-2023 – 27-12-2023) were carried out with the respective equipment as described in the content.

The scope of works carried out at the site was as follow: -
Borehole : 03 Numbers

2.0 DEEP BORING

2.1 Boring Plant

The boring plant used was one unit HGY 200 and drilling to depths indicated in the Bill of Quantities and Drawings. These boring rigs are also suitable for advancing the borehole, sampling, in-situ testing and rock drilling in accordance with the relevant specifications of each of these operations.

2.2 Method

The methods for advancing the boreholes were rotary boring, continuous samplings rotary drilling or a combination of these methods. When undisturbed samples were taken, a reasonably clean hole was provided and the portion of the soil to be sampled was not unduly disturbed.

2.3 Size and Depth of Borehole

The sizes of the boreholes were such that all the requirements of sizes in sampling, in-situ testing, etc. were satisfied. In this instance, the size of the boreholes was 76mm in diameter. For this project, boring in soil was terminated as instructed by the S.O.'s representative at the site.

2.4 Rock Drilling

The procedure for rock drilling used was as in accordance with BS 5930: 1981. The diameter of the core barrels used was such as to produce a rock core of 54.0mm diameter size that is NMLC or NX core barrels. The Core Recovery Ratio (CRR) and the Rock Quality Designation (RQD) was also reported for each core run.

The CRR meant the ratio of the total length of good quality core over the drilling length expressed to the nearest 5%. The RQD was the ratio of the total length of good quality core each exceeding 100mm in length over the drilling run correct to the nearest 5% also. Good quality rock defined as intact core having a fully circular circumference or in the case of broken rock fragments assembled to form cores with fully circular circumference.

2.5 Sampling in Boreholes

Disturbed samples were obtained by means of split spoon samplers, which were equipped with flap retainer or basket retainer or other attachments necessary for cohesion-less soil. The maximum amounts of soil samples obtained were such that the quantity is sufficient to carry out various classification tests.

Undisturbed samples were taken with the thin-wall tube sampler described in BS 5930 or as directed. The minimum internal diameter of the tube used was 50mm and the minimum length of the tube was 450mm.

2.6 Field Testing

Standard Penetration Test (SPT) was carried out in accordance with Test No. 19 B.S. 1377:1975, "Determination of the penetration resistance using the split barrel sampler and a self tripping hammer of approved design". Generally, it was carried out in all types of soil except the very soft and soft clays, at 1.5m intervals or change of strata or as instructed by S.O.'s representative.

The value of the N as defined in the B.S. method was reported together with the number of blow counts for each 75mm penetration of the sampling tube. The blow counts for the first 150mm penetration (the seating drive) which does not contribute the value of N was also included. Two examples are 2, 3, 6, 7, 10, 19 will give $N = 42$ and 10, 12, 35, 15/25mm will give $N = 50/100\text{mm}$.

Example, when a penetration resistance of 50 blows for 25mm penetration was encountered in a seating drive the test would stop and the SPT value would be $N^* = 50/25\text{mm}$. The soil samples recovered from the split barrel were preserved as disturbed samples for subsequent testing.

2.7 Ground Water Level Observation

The observations of ground water level in the boreholes were made with either a tape rod diameter or rule or electric dip meter as directed by the S.O.'s Representative.

In cased boreholes, before a day's work was completed, the casings were rolled up about 0.30m and left in such a position overnight. The recordings were repeated daily while boring for that particular hole were in progress and were taken at the following time intervals.

- a) Before work commences in the morning
- b) At the end of the day's work

The water levels recorded in the boreholes/drill holes logs were levels observed in these investigation holes during the period of the site investigation. Such observed levels may not necessarily be the actual groundwater levels that are subject to seasonal fluctuations from time to time.

For boreholes involving impervious stratum, the casing top was capped overnight to prevent entry of rainwater and subsurface water.

2.8 Collection of Groundwater Samples

Groundwater samples were collected from the boreholes after groundwater was first encountered and it was collected by bailing with a clean container and stored in a clean water tight glass or plastic container. The groundwater was then sent to the Laboratory for chemical analysis.

2.9 Preservation, Storage, Transportation and Labelling of Soil Samples

Disturbed samples were normally preserved immediately after being recovered, in double layered heavy gauge polyethylene bags sealed to form an air tight bag.

2.10 Preservation of Undisturbed Samples

About 40mm of the soil were removed from the top and bottom of the thin-wall sampling tube. Then the ends of the tube were filled with non shrinking microcrystalline wax in clearly labelled and legibly marked with the name of the project, of sampling, date taken and the type of sample.

2.11 Preservation Storage and Transportation of Rock Cores

The JKR Standard core boxes were used with the name of the project and borehole number printed on the cover. The labelling inside the boxes followed that recommended by JKR.

2.12 Disposal of samples

All soil and rock samples shall be disposed of after a period of 6 month, unless officially requested by the client/consultant to store for a further period.

BORING LOG

BOREHOLE LOG

PROJECT: EIA -P2 OIL SDN BHD										BOREHOLE NO: BH1									
Location: LOT 225111, PERAK										Sheet 1 of 3									
Type of boring: Rotary Wash Boring										Reduce level:									
Type of rig: HGY - 200										Final water table: 0.6m									
Diameter of boring: 76mm										Date drilled: 19/12/23-23/12/23									

Depth (metre)	Description Of Soil	Log	α ∞ S	Field Tests and Sampling								Recovery Ratio	SPT PLOT		
				Depth (metre)	Sample No.	Standard Penetration Test									
						75 mm	75 mm	75 mm	75 mm	75 mm	75 mm			N	
1	- TOP SOIL -	---	..	0.00											
		--	.	0.50											
		---	..												
		--	.												
		---	..												
		--	.												
2	Soft, brownish yellow clayey SILT	xxx	--	1.50	P1/D1	1	0	1	1	1	1	4	44%		
		xx	-	1.95											
		xxx	--												
		xx	-												
		xxx	--												
		xx	-												
3	Soft, reddish brown Silty CLAY	xx	-	3.00	P2/D2	1	0	1	0	1	0	2	100%		
		---	xx	3.45											
		--	x												
		---	xx												
		--	x												
		---	xx												
4	-DITTO-	--	x	4.50	P3/D3	1	0	0	0	1	1	2	100%		
		---	xx	4.95											
		--	x												
		---	xx												
		--	x												
		---	xx												
5	-DITTO-	--	x	6.00	P4/D4	1	0	1	0	1	1	3	100%		
		---	xx	6.45											
		--	x												
		---	xx												
		--	x												
		---	xx												
6	-DITTO-	--	x	7.50	P5/D5	1	0	0	0	1	1	2	88%		
		---	xx	7.95											
		--	x												
		---	xx												
		--	x												
		---	xx												
7	-DITTO-	--	x	9.00	P6/D6	1	0	0	0	0	1	1	88%		
		---	xx	9.45											
		--	x												
		---	xx												
		--	x												
		---	xx												
8	Very soft, reddish brown Silty CLAY	--	x												
		---	xx												
		--	x												
		---	xx												
		--	x												
		---	xx												
9		--	x												
		---	xx												
		--	x												
		---	xx												
		--	x												
		---	xx												
10		--	x												
		---	xx												
		--	x												
		---	xx												
		--	x												
		---	xx												

Legend

VS

Vane Shear Test

P

Standard Penetration Test

D

Disturbed Sample

UD

Undisturbed Sample

M

Mazier Sample

C

Coring (Rock)

S&R

Sampling & Recovery

N

No of blow/300mm

Legend

xxxx

Silt

xxx

Clay

Sand

....

Gravel

oooo

ooo

Limestone

CLIENT:

CONSULTANT:

CONSISTENCY/RELATIVE DENSITY

Cohesive soil (N)

Non Cohesive soil (N)

0 - 2 very soft

0 - 4 very loose

2 - 4 soft

4 - 10 loose

4 - 8 medium stiff

10 - 30 medium dense

8 - 15 stiff

30 - 50 dense

15 - 30 very stiff

> 50 very dense

> 30 hard

WAZAMA ENTERPRISE

Supervisor: CHE ZULKIFLI

Checked by: WAN HASBULLAH

BOREHOLE LOG

PROJECT: EIA -P2 OIL SDN BHD										BOREHOLE NO: BH1									
0										Sheet 2 of 3									
Location: LOT 225111, PERAK																			
Type of boring: Rotary Wash Boring										Reduce level:									
Type of rig: HGY - 200										Final water table: 0.6m									
Diameter of boring: 76mm										Date drilled: 19/12/23-23/12/23									

Depth	Description Of Soil	Log	α ∞ s	Field Tests and Sampling								Recovery Ratio	SPT PLOT			
				Depth	Sample No.	Standard Penetration Test										
						75 mm	75 mm	75 mm	75 mm	75 mm	75 mm			N		
(metre)				(metre)												
11	Very Soft, reddish brown Silty CLAY	---	xx		10.50	P7/D7	1	0	0	0	0	0	0	100%		
		--	x		10.95											
12		---	xx			12.00	P8/D8	1	0	0	0	0	0	0		100%
		--	x			12.45										
13	---	xx		13.50		P9/D9	1	0	0	0	0	0	0	100%		
	--	x		13.95												
14	---	xx			15.00	P10/D10	1	0	0	0	0	0	0	100%		
	--	x			15.45											
15	---	xx			16.50	P11/D11	1	0	0	0	1	1	2	88%		
	--	x			16.95											
16	Soft, reddish brown clayey SILT with a little of fine sand	xxx		--		18.00	P12/D12	1	0	0	0	1	1	2		100%
		xx		-		18.45										
17		---	xx			19.50	P13/D13	1	0	0	0	0	1	1		82%
		xx	-			19.95										
18	-DITTO-	xxx	--													
		xx	-													
19		---	xx													
		xx	-													
20	Stiff,reddish brown clayey SILT with a little of fine sand	xxx	--													
		xx	-													

VS Vane Shear Test

P Standard Penetration Test

D Disturbed Sample

UD Undisturbed Sample

M Mazier Sample

C Coring (Rock)

S&R Sampling & Recovery

N No of blow/300mm

Silt

Clay

Sand

Gravel

Limestone

CLIENT:

CONSULTANT:

CONSISTENCY/RELATIVE DENSITY

Cohesive soil (N)

Non Cohesive soil (N)

0 - 2 very soft

0 - 4 very loose

2 - 4 soft

4 - 10 loose

4 - 8 medium stiff

10 - 30 medium dense

8 - 15 stiff

30 - 50 dense

15 - 30 very stiff

> 50 very dense

> 30 hard

WAZAMA ENTERPRISE

Supervisor: CHE ZULKIFLI

Checked by: WAN HASBULLAH

BOREHOLE LOG

PROJECT: EIA -P2 OIL SDN BHD

0

Location: LOT 225111, PERAK

Type of boring: Rotary Wash Boring

Type of rig: HGY - 200

Diameter of boring: 76mm

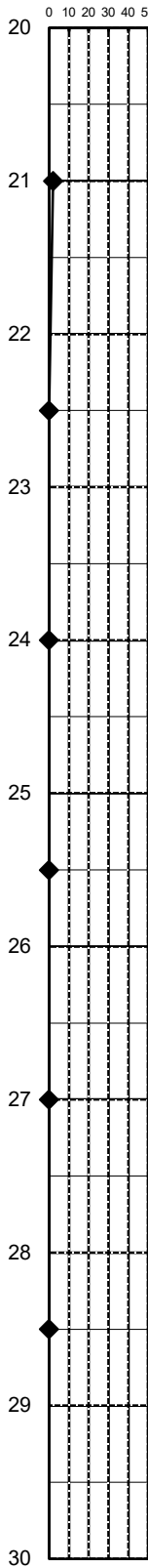
BOREHOLE NO: BH1

Sheet 3 of 3

Reduce level:

Final water table: 0.6m

Date drilled: 19/12/23-23/12/23

Depth	Description Of Soil	Log	α ∞ s	Field Tests and Sampling								Recovery Ratio	SPT PLOT		
				Depth	Sample No.	Standard Penetration Test									
						75 mm	75 mm	75 mm	75 mm	75 mm	75 mm			N	
(metre)				(metre)											
21	-DITTO-	xxx xx xxx xx xxx xxx xx	-- - -- - -- -- -		21.00 21.45	P14/D14	1	0	0	0	1	1	2	57%	
22	END OF BH AT 21.45m depth														
23															
24															
25															
26															
27															
28															
29															
30															

Legend

 VS Vane Shear Test

 P Standard Penetration Test

 D Disturbed Sample

 UD Undisturbed Sample

 M Mazier Sample

 C Coring (Rock)

 S&R Sampling & Recovery

 N No of blow/300mm

 Silt

 Clay

 Sand

 Gravel

 Limestone

CLIENT: 0

CONSULTANT:

CONSISTENCY/RELATIVE DENSITY

Cohesive soil (N)

Non Cohesive soil (N)

0 - 2 very soft

0 - 4 very loose

2 - 4 soft

4 - 10 loose

4 - 8 medium stiff

10 - 30 medium dense

8 - 15 stiff

30 - 50 dense

15 - 30 very stiff

> 50 very dense

> 30 hard

GERUDIGEOTEK SDN. BHD.

GERUDI

Supervisor: CHE ZULKIFLI

Checked by: WAN HASBULLAH

SITE PHOTOS



Figure 1 : BH1 AT P2 OIL SDN BHD SITE



Figure 2 : BH1 SPT SAMPLE



Figure 3 : BH1 SPT SAMPLE



Figure 4 : BH1 WATER STANDPIPE

LOCATION PLAN

P2 Oil Sdn Bhd

Write a description for your map.

Legend

 BH1

 BH1

Google Earth

Image © 2023 Airbus



60 m

APPENDIX 6.6

ENVIRONMENTAL MONITORING PLAN

MONITORING INFO

Project: **PROPOSED PYROLYSIS PLANT AT LOT 225111, JALAN GOPENG, TUNGZEN INDUSTRIALPARK, MUKIM SUNGAI RAYA, 31300 KAMPUNG KEPAYANG, PERAK DARUL RIDZUAN BY P2 OIL SDN BHD**

Project Proponent: **P2 OIL SDN BHD**

1.0 Water Quality**Location**

Location of Water Quality Monitoring Stations

Location	Description	Coordinate	
		Latitude	Longitude
W1	Upstream (External Drain - Before Project site)	4°30'45.0"N	101°08'57.2"E
W2	Downstream (External Drain After Project site)	4°30'44.3"N	101°08'54.3"E
W3	Downstream (Stormwater Drainage)	4°30'42.5"N	101°08'42.5"E
W4	Downstream (Stormwater Drainage)	4°31'01.0"N	101°08'17.4"E
W5	Downstream (Sungai Raya)	4°31'00.5"N	101°08'16.5"E

Parameters

No	Parameter	Unit	Method Reference
1	pH	-	APHA 4500 H+B
2	Temperature	°C	APHA 2550 B
3	BOD ₅ at 20 °C	mg/L	APHA 5210 B
4	COD	mg/L	APHA 5220 C

APPENDIX 1

5	Total Suspended Solids	mg/L	APHA 2540 D
6	Ammoniacal Nitrogen	mg/L	APHA 4500 NHB3-F
7	Oil and Grease	mg/L	APHA 5520 B
8	Dissolved Oxygen	mg/L	APHA 4500 O-G
9	E.Coli	CFU/100 mL	APHA 9222 G
10	Cd	mg/L	APHA 3111 B
11	Cr(VI)	mg/L	APHA 3500 Cr B
12	Cr(III)	mg/L	In-House Method EC-SM-022, based on APHA 3111 B & APHA 3500 Cr B
13	Cu	mg/L	APHA 3111 B
14	Fe	mg/L	APHA 3111 B
15	Pb	mg/L	APHA 3111 B
16	Mn	mg/L	APHA 3111 B
17	Ni	mg/L	APHA 3111 B
18	Sn	mg/L	In-House Method EC-SM-011, based on APHA 3114 B
19	Zn	mg/L	APHA 3111 B
20	Hg	mg/L	APHA 3112 B
21	As	mg/L	APHA 3114 B
22	Turbidity	NTU	
23	Drain/River Width	m	
24	Drain/River Depth	m	
25	Drain/River Velocity	m/s	
26	Drain/River Discharge	m ³ /s	

2.0 Air Quality

Location

Location of Air Quality Monitoring Stations

Location	Description	Coordinate	
		Latitude	Longitude
A1	Project Boundary	4°30'44.4"N	101°08'54.6"E
A2	Nearest Shophouse at Taman Seri Raia	4°30'38.6"N	101°08'24.7"E
A3	Nearest House at Kg Tekkah	4°30'05.6"N	101°08'48.6"E
A4	Entrance at Auasia Nutriculture (Agro Based Industry)	4°30'53.3"N	101°09'04.0"E

Parameters

Parameter	Standard Method
Particulate Matter 10µm (PM ₁₀)	AS 2724.6 Determination of Particulate Matter 10µm (PM10) – PM10 High Volume Sampler Gravimetric Method USEPA 40 Part 50, Appendix J – The Determination of Particulate Matters in the Atmosphere
Particulate Matter 2.5µm (PM _{2.5})	In house method – Air-No. 5 (Based on USEPA 40 CFR Part 50 Appendix L) Determination of Particulate Matter 2.5µm (PM2.5) – Mini Vol TAS Portable Tactical Air Sampler Gravimetric Method
Sulphur Dioxide (SO ₂)	ISC 704 A Determination of Sulphur Dioxide, SO ₂ content of the atmosphere
Nitrogen Dioxide (NO ₂)	ISC 408 Analysis of Atmospheric Nitrogen Dioxide, NO ₂
Carbon Monoxide (CO)	EC-IAQ-01 – Determination of CO in the atmosphere
Ozone	EC-IAQ-04 – Determination of O ₃ in the atmosphere
Volatile Organic Compound (VOC)	NIOSH 2549 – Measurement of VOC were performed using air sampling pump Mass Flowmeter

3.0 Noise Level

Location

Location of Noise Level Measurement Stations

Location	Description	Coordinate	
		Latitude	Longitude
N1	Project Boundary	4°30'44.4"N	101°08'54.6"E
N2	Nearest Shophouse at Taman Seri Raia	4°30'38.6"N	101°08'24.7"E
N3	Nearest House at Kg Tekkah	4°30'05.6"N	101°08'48.6"E
N4	Entrance at Auasia Nutriculture (Agro Based Industry)	4°30'53.3"N	101°09'04.0"E

Parameters

Parameter	Duration	Method Reference
Equivalent Continuous Sound Level (LAeq)	24 hours	ISO 1996/1
Maximum Noise Level (LAmax)	24 hours	ISO 1996/1
Minimum Noise Level (LAmin)	24 hours	ISO 1996/1
Statistical indices (LA10 and LA90)	24 hours	ISO 1996/1



Locations of Water, Air and Noise Monitoring Stations

APPENDIX 9.1
GUIDEBOOK ON PERFORMANCE
MONITORING OF SCRUBBER

APPENDIX 9

TYPICAL FORM TO RECORD PERFORMANCE DATA OF SCRUBBER (PREVENTIVE MAINTENANCE)

(B) WEEKLY

Month : _____

Year : _____

Date	Procedure	Notes	Entries by Operator			Checked by Supervisor		
			Name	Sign	Date	Sign	Name	Date
	Check recirculation pump discharge pressure							
	Check fan motor operating current							
	Check circulation pump motor operating current							

APPENDIX 9

(C) MONTHLY

Month : _____

Year : _____

Date	Procedure	Notes	Entries by Operator			Checked by Supervisor		
			Name	Sign	Date	Sign	Name	Date
	Check fan vibration							
	Check pump vibration							
	Check pump/ piping leakages							
	Check fan motor temperature							
	Check pump motor temperature							
	Check spray nozzles plugging or leaks							

APPENDIX 9

(D) SEMI ANNUALLY

Month : _____

Year : _____

Date	Procedure	Notes	Entries by Operator			Checked by Supervisor		
			Name	Sign	Date	Sign	Name	Date
	Inspect fan on material build up.							

(E) HALF YEARLY

Month : _____

Year : _____

Date	Procedure	Notes	Entries by Operator			Checked by Supervisor		
			Name	Sign	Date	Sign	Name	Date
	Inspect fan drive mechanisms, i.e. bearings, belt tensioning, grease level, etc. Inspect mist eliminator for any solid build-up.							

APPENDIX 9

Date	Procedure	Notes	Entries by Operator			Checked by Supervisor		
			Name	Sign	Date	Sign	Name	Date
	Inspect packing for any fouling. Pump servicing – replace bearing, grease & mechanical seal (for end suction centrifugal pump).							

APPENDIX 9

(F) ANUALLY

Month : _____

Year : _____

Date	Procedure	Notes	Entries by Operator			Checked by Supervisor		
			Name	Sign	Date	Sign	Name	Date
	Verify accuracy of monitoring instruments and calibrate Inspect physical conditions of scrubber, ie housing, ductwork, etc Overall system cleaning.							

APPENDIX 9.2

SAFETY AND HEALTH POLICY

P2 OIL SDN BHD

SAFETY & HEALTH POLICY

FOR

PROPOSED RUBBER TIRE WASTES AND RELATED FEEDSTOCKS FOR REFINED OIL MANUFACTURING AT PYROLYSIS FACILITY ON PART OF LOT 225111 (PLOT A), JALAN GOPENG, KAWASAN PERINDUSTRIAN TUNGZEN, MUKIM SUNGAI RAYA, 31300 KAMPUNG KEPAYANG, PERAK DARUL RIDZUAN

P2 Oil Sdn Bhd (POSB) is committed to provide a safe and healthy work environment for all employees, customers, contractors, visitors, and others who may be affected by our activities.

POSB is committed for prevention of work-related injury, ill health, and occupational diseases by implementing hazard identification, hazard assessment and determining control. We promote and continuously improve our safety and health management system and performance. POSB will comply with all the applicable legal and other requirements from interested parties, wherever we work and strive to maintain and improve our OSH management system.

POSB is committed to achieve the objectives of this policy through the following systems and practices:

- Ensuring all operation complies with all the applicable legal and other requirements. We must ensure that an effective Safety and Health Plan that addresses the risk in our areas of control is prepared, approved, and implemented, and the people working there comply with the requirements of this policy and the plan.
- Maintaining relevant safe work systems, procedures, information, safety programs, facilities, equipment, tools, and organizational responsibility and authority to support and communicate effective safety and health practices throughout the organization.
- Provision of appropriate safety and health training to all relevant persons who are exposed to the workplace hazards and risks.
- Effectively disseminating OSH policy and information to all employees, contractors and interested parties.
- Ensure continuous improvement by establishing clear targets and objectives to improve safety and health in workplace.
- Promoting and maintaining a positive safety and health culture through encouraging active participation, consultation and cooperation of all employees, contractors, visitors and interested parties in developing measures to improve safety and health at work.



.....
TAN SHENG YAN
DIRECTOR

DATE: 26 FEBRUARY 2024

APPENDIX 9.3

EMERGENCY RESPONSE PLAN

**EMERGENCY RESPONSE PLAN (ERP) FOR
PROPOSED RUBBER TIRE WASTES AND RELATED
FEEDSTOCKS FOR REFINED OIL MANUFACTURING
ON PART OF LOT 225111 (PLOT A), JALAN
GOPENG,
KAWASAN PERINDUSTRIAN TUNGZEN,
MUKIM SUNGAI RAYA,
31300 KAMPUNG KEPAYANG,
PERAK DARUL RIDZUAN**



**PROJECT PROPONENT
P2 OIL SDN BHD**

**LOT 225111, JALAN GOPENG, KAWASAN PERINDUSTRIAN
TUNGZEN, MUKIM SUNGAI RAYA, 31300 KAMPUNG KEPAYANG,
PERAK DARUL RIDZUAN**

**DATE: 22/02/2024
REVISION NO: 0**

HISTORY OF AMMENDMENTS

Rev	Issuance Date	Amendments Made
0	22nd February 2024	-

SECTION 1**EMERGENCY RESPONSE PLAN****1.1 OBJECTIVE AND SCOPE OF EMERGENCY RESPONSE PLAN (ERP)**

- The ERP is to make provisions in the form of procedures and action plans for the smooth handling of emergency situations, including search, rescue and recovery operations and other relief work.
- The main focus shall be on the safety of the employees as the first priority when any potential hazards occur.
- The scope of the ERP includes plans for safety of human lives as follows:

Table 1: Scope of ERP

No.	Scope	Explanation
(1)	Types of emergencies	Potential hazards and threats to human lives and the environment.
(2)	Safety procedures	For all work activities when accidents occur.
(3)	Emergency organization and responsibilities	Formation of a well-trained and well-equipped response team for fast and effective rescue operations when required.
(4)	Details of emergency services	Instructions for notification to the proper authorities (including contact numbers, etc.).
(5)	A list of key personnel	Individuals responsible to organize and control operations in emergency situations.
(6)	Internal and external communication	A communication plan to ensure that all the site personnel are aware of their duties in an emergency.

1.2 EMERGENCY RESPONSE TEAM (ERT) DURING OPERATION PHASE

- The ERT can be part of the Environmental Management Team (EMT) for the Project, with common team members.
- The flow of communication during an emergency occurrence at the site is shown in **Figure 1**.

- The ERT members will be the same and they have different responsibilities to overcome an emergency situation at the site. However, as the types of emergencies differ in different situations, their roles may be interchangeable depending on the situation. The exact details of operations during an emergency situation will be worked out by the ERP team. An all-round comprehensive training of ERT personnel is important to ensure that they can respond quickly to all emergency situations.
- The ERT leader, who in this case is the Plant Manager, shall coordinate all actions and shall submit relevant documentation to the relevant authority if the need arises after an emergency has occurred. This will avoid confusion and duplication of efforts.
- **Table 2** shows the key members of the ERT and their respective responsibilities.

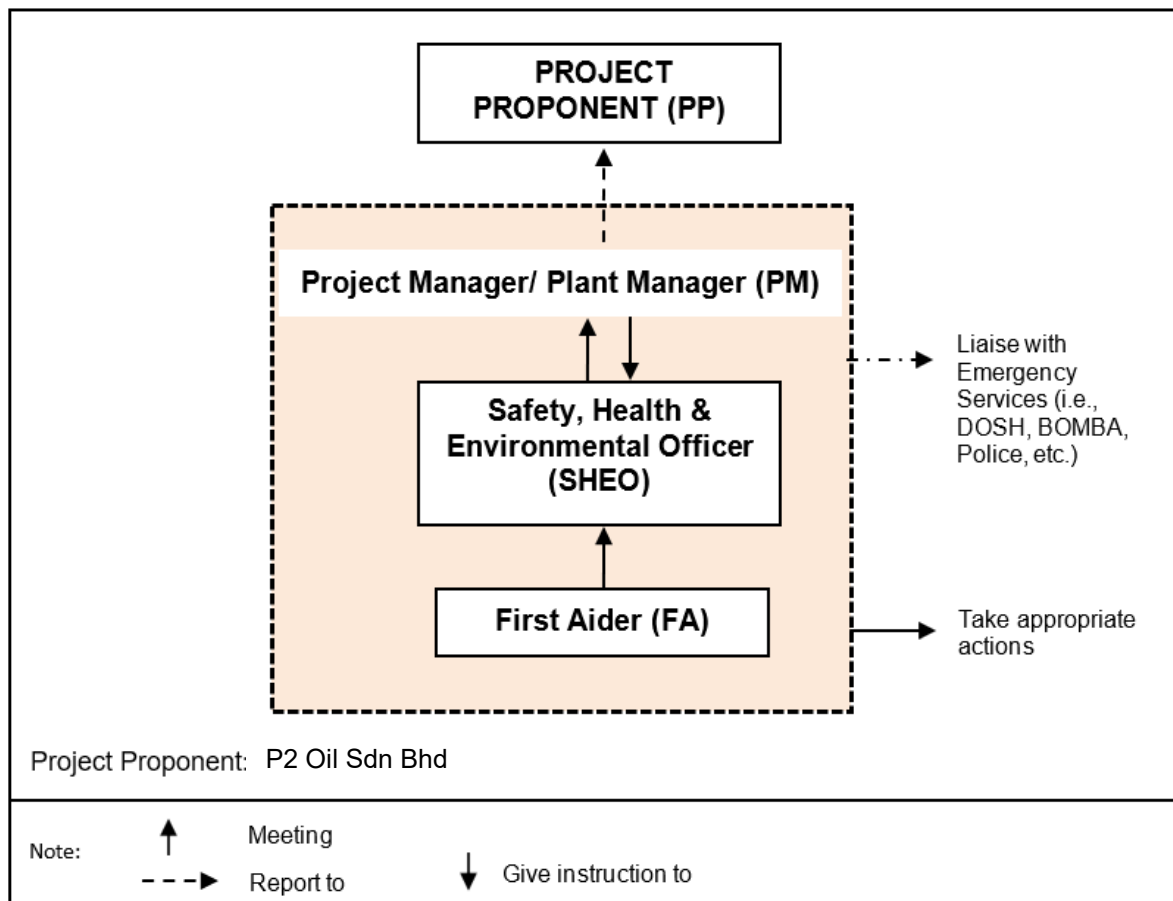


Figure 1: Flow of Communication during Emergency

Table 2: Key Member of the ERT and their Responsibilities

Personnel	Responsibility
Project Proponent (PP)	
Plant Manager	• Coordinate with the Engineering Consultant and other parties on all operation matters. • Oversee safety and health and operation at the plant. • Chair Plant Meetings and collaborate with other parties involved in operation.
Plant SHE Officer / Deputy	<u>Overall management for on-site safety</u> • Oversee all emergency handling procedures, equipment, staffing checking and auditing to ensure the plant is well prepared. • Ensure the plant personnel are well prepared for any emergency. • Ensuring the First Aid Team is well-trained and well-equipped. • Establish a Safety & Health Manual and constantly update and revise the manual. • Train all levels of staff in hazard and ERP. • Accompany the Government-appointed Occupational Safety and Health Officers on plant visits and act on their recommendations. • Maintain controlled access at the site including updating site layout plan, showing the emergency assembly area. • Coordinate disaster control plan with off-site agencies such as the BOMBA, police, hospital and other relevant authorities. • Report to the Plant Manager before and after the emergency incident. • Manage all site safety-related information and data to compile the Safety Monthly Reports. • Issue Safety Deficiency Note (SDN) / Safety Memo when non-compliances are found during safety inspection. <u>Specifically, in case of emergency:</u> • On receiving an emergency alert from any personnel (i.e., discoverer, worker, etc.) activate the ERP. • Immediately, liaise closely with the Plant Manager and give instructions on measures to take regarding the emergency situation. • Manage and mobilize the First Aid Team during emergency. • Permit access to the site for emergency relief, all identified agencies' vehicles and personnel, Government officials, Consultant(s) and the management personnel. • To check the visitors' log book for the arrival of all visitors and site personnel at the emergency assembly area.

	• To give directions to the responding Emergency Services vehicles and personnel and Government Inspectors to allow these people to go directly to the emergency area and provide such information to allow them to proceed safely and without risk. • Prepare all the necessary documentation after the emergency, record all accidents in the Project Accident Record Book and report to the Plant Manager all the details as required for insurers and various Governmental agencies.
Medical Support/First Aider	<u>Overall management for on-site safety:</u> • Select, organize and train the First Aid Team. • Prepare the necessary medical equipment at the plant. • Advise on safety response procedures to the plant personnel. • Carry out site survey, in association with the SHE Officer, on assembly locations. • Determine, together with the SHE Officer, the types of accidents or dangerous occurrences most likely to occur and recommend the means of preventing such recurrences. • Assist with training for all levels of employees on safety. • Keep up-to-date information on recommended codes of practices and new safety literature. Circulate the applicable information to all levels of employees. <u>Specifically, in case of emergency:</u> • Mobilize First Aiders and medical facilities in case of an emergency event and activate the First Aid process. • Assess injured person(s) and decide on what needs to be done. • Support the SHE Officer in managing emergency situations. • To render lifesaving first aid and make the casualty comfortable and safe until relieved by the responding Agency officer (ambulance office). • To know the location of the nearest fixed and portable first aid kits.
Workers	<u>Specifically, in case of emergency:</u> • Cease work. • Switch off all engines, electrical equipment and apparatus. • Clear all vehicles and equipment on all access roads. • Report to Assembly Area for further instructions.

1.3 TYPES OF EMERGENCIES AND RESPONSE ACTION PLANS DURING OPERATION PHASE

The types of emergencies and the contingency measures during the operation phase are indicated in **Table 3**.

Table 3: Types of Emergency and Response Action Plans

Type of Emergency	Response Action Plan
Incident / Accident	Refer to Figure 2
Fatal Accidents	Refer to Figure 3
Fire or Explosions	Refer to Figure 4
Major Oil and Hazardous Materials Spillage	Refer to Figure 5

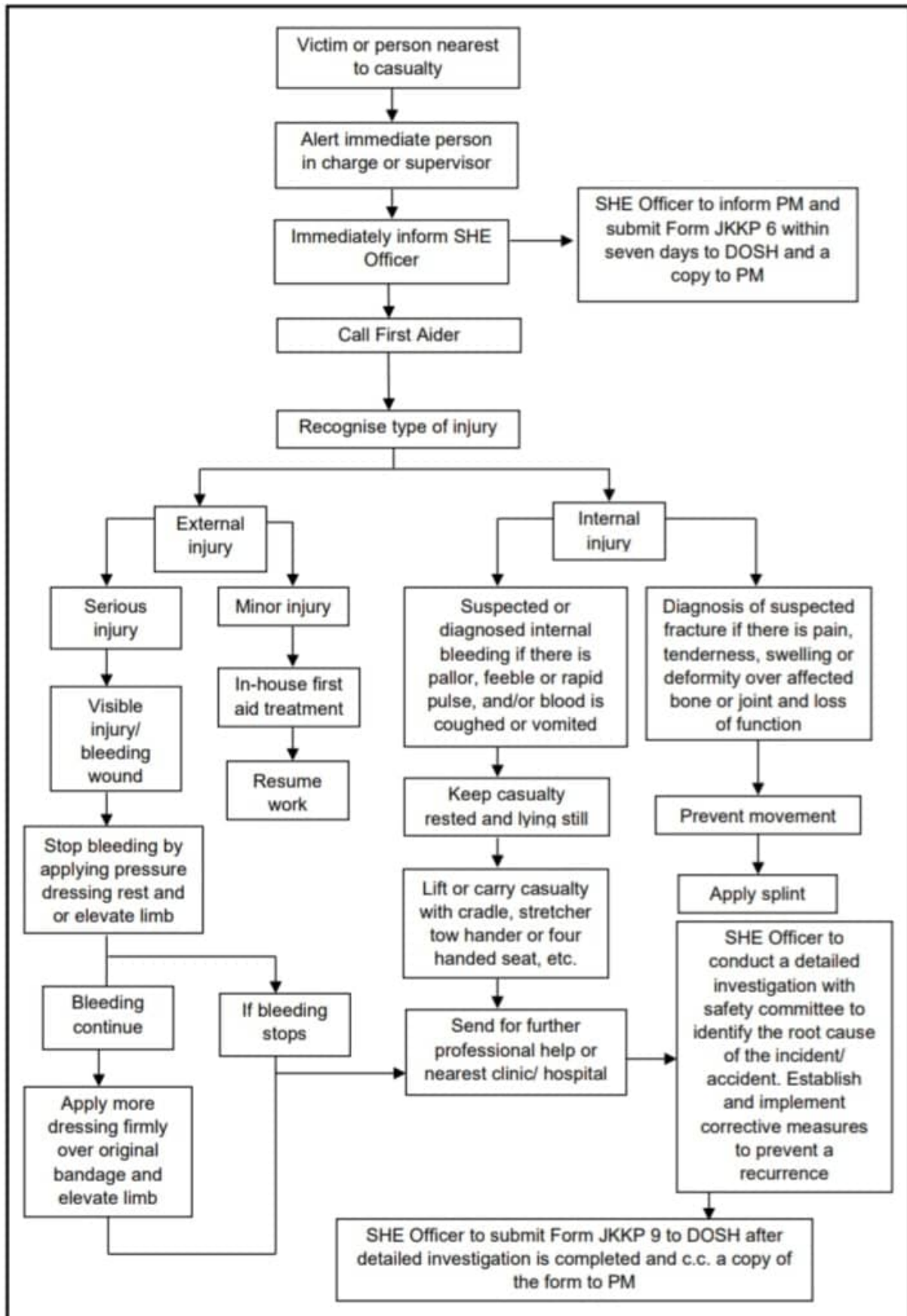
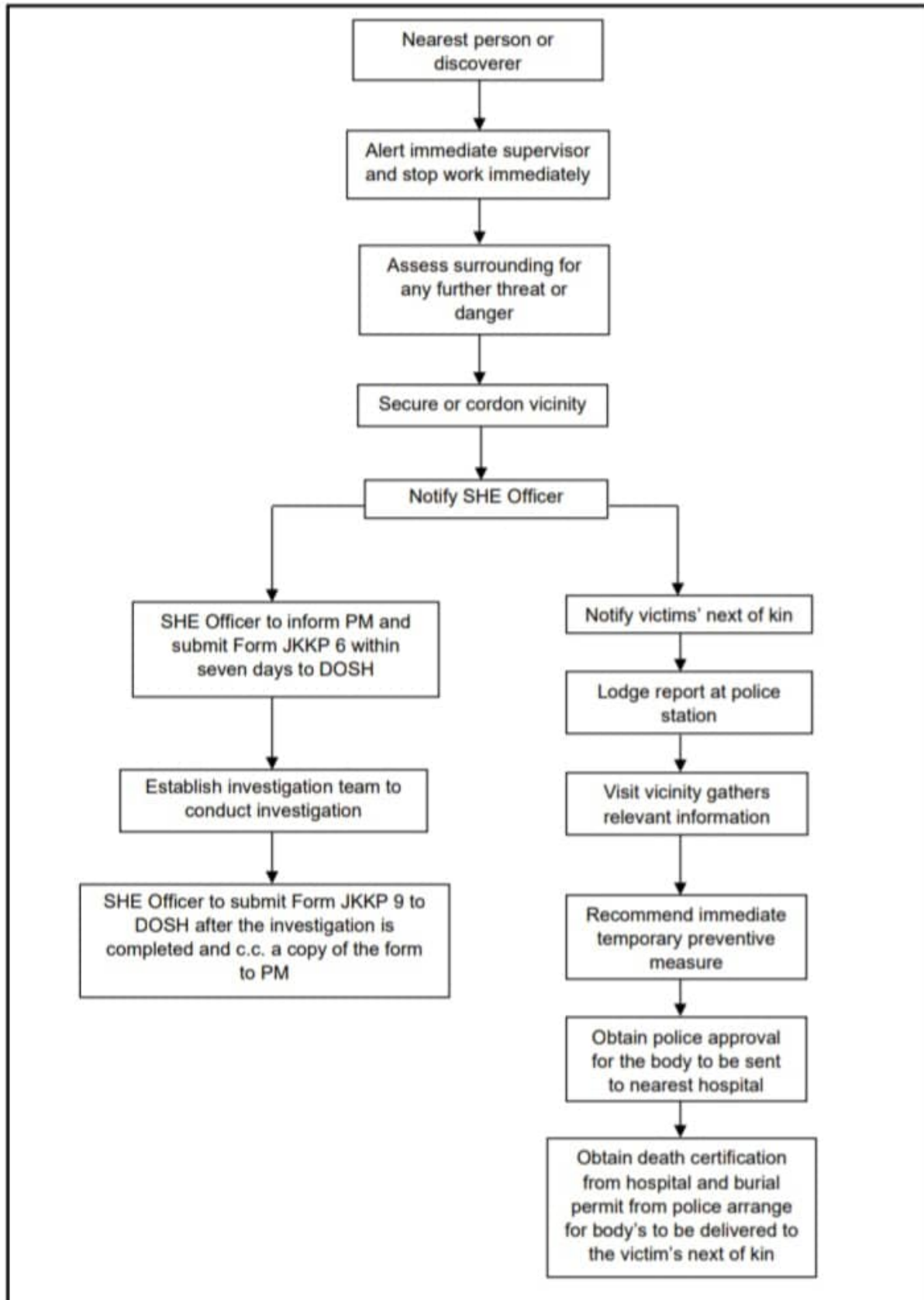


Figure 2: Incident / Accident Flow Chart

**Figure 3: Fatal Accidents Flow Chart**

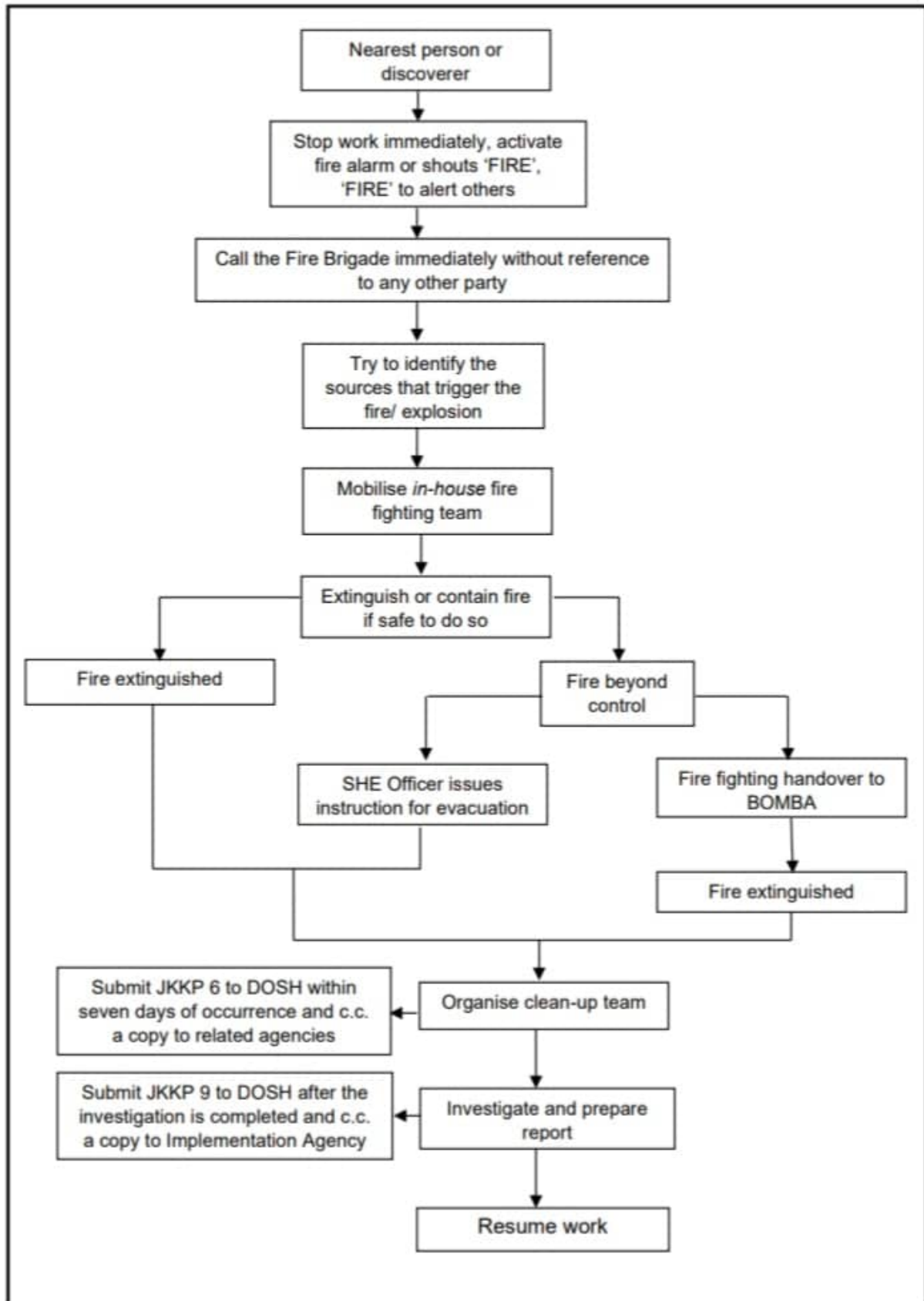


Figure 4: Fire or Explosions Flow Chart

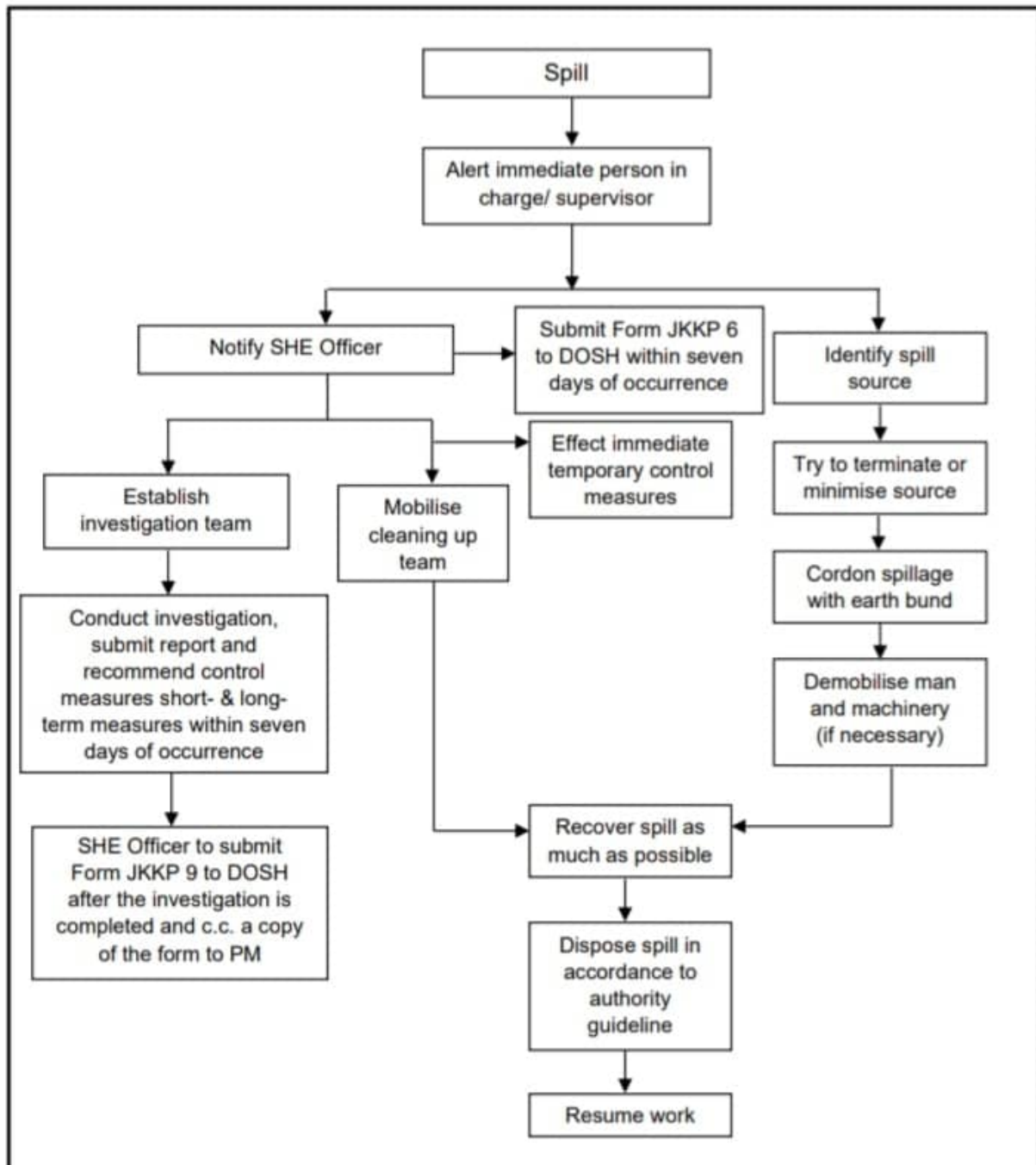


Figure 5: Major Oil and Hazardous Materials Spillage Flow Chart

1.4 INTERNAL ACCIDENT REPORTING DURING OPERATION PHASE

1.4.1 Internal Reporting Procedures

- In case of any incident/accident, the SHE Officer must be immediately alerted.
- The SHE Officer shall provide coordination in response to the situation during the incident/accident.

1.4.2 Contact Details for Internal Reporting

The contact details for internal reporting to the ERT are provided in **Table 4**.

Table 4: Contact Details for Internal Reporting

Name	Position	Contact Number
Tan Sheng Yan	Director	016-323 4323