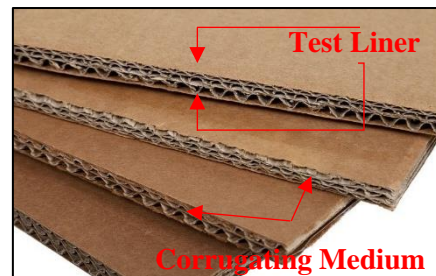


PROJECT TITLE

Proposed Upgrading of Paper Mill at 1 ½ Miles, Off Jalan Sungai Chua, Bukit Angkat Industrial Area, Mukim Pekan Kajang, Daerah Hulu Langat, Selangor Darul Ehsan

INTRODUCTION

- MUDA Kajang Paper Mills was established in 1971 (ISO certified plant)
- Existing plant produces 800 tonnes of corrugating medium and test liner daily
- Project proponent intends to:
 - Increase plant production rate
 - Install higher efficiency facilities
 - Replace two (2) existing old machines
 - Improve plant operation
 - Conduct material and energy recovery
- Proposed plant upgrading has obtained:
 - Approval letter from Ministry of International Trade and Industry (MITI)
 - No objection letter from Selangor State Government



Existing Corrugating Medium and Test Liner Product

PROJECT PROPONENT

Project Proponent : MUDA Paper Mills Sdn. Bhd.
 Address : 1 ½ Miles, Off Jalan Sungai Chua, Bukit Angkat Industrial Area, 43000 Kajang, Selangor Darul Ehsan
 Tel./Fax No. : 03-8732 2626/03-8736 6869
 Contact Person : Mr. Wong Mun Chen
 Position : Senior General Manager
 Email : mcwong@mpkj.com

EIA CONSULTANT

EIA Consultant : Exxergy Resources Sdn. Bhd.
 Address : No. 39, Jalan Kempas Utama 1/3, Taman Kempas Utama, 81300 Johor Bahru, Johor Darul Ta'zim.
 Tel./Fax No. : 07-520 4951/ 07-553 6319
 Contact Person : Prof. Ir. Dr. Mohd Rozainee bin Taib
 Position : EIA Lead Consultant
 Email : rozainee@gmail.com

LEGISLATIVE REQUIREMENT**SECOND SCHEDULE****6. INDUSTRY**

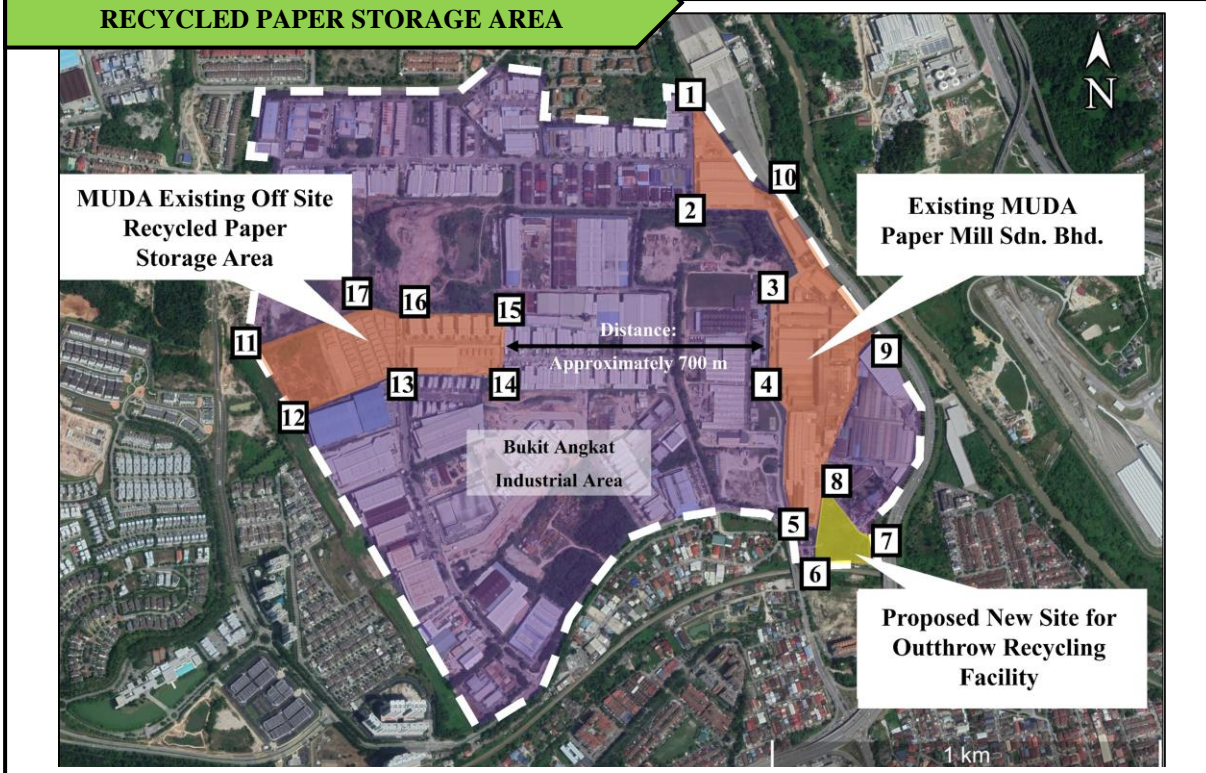
(f) Recycle paper industry

Production capacity of 50 tonnes or more per day

LOCATION OF PROJECT SITE

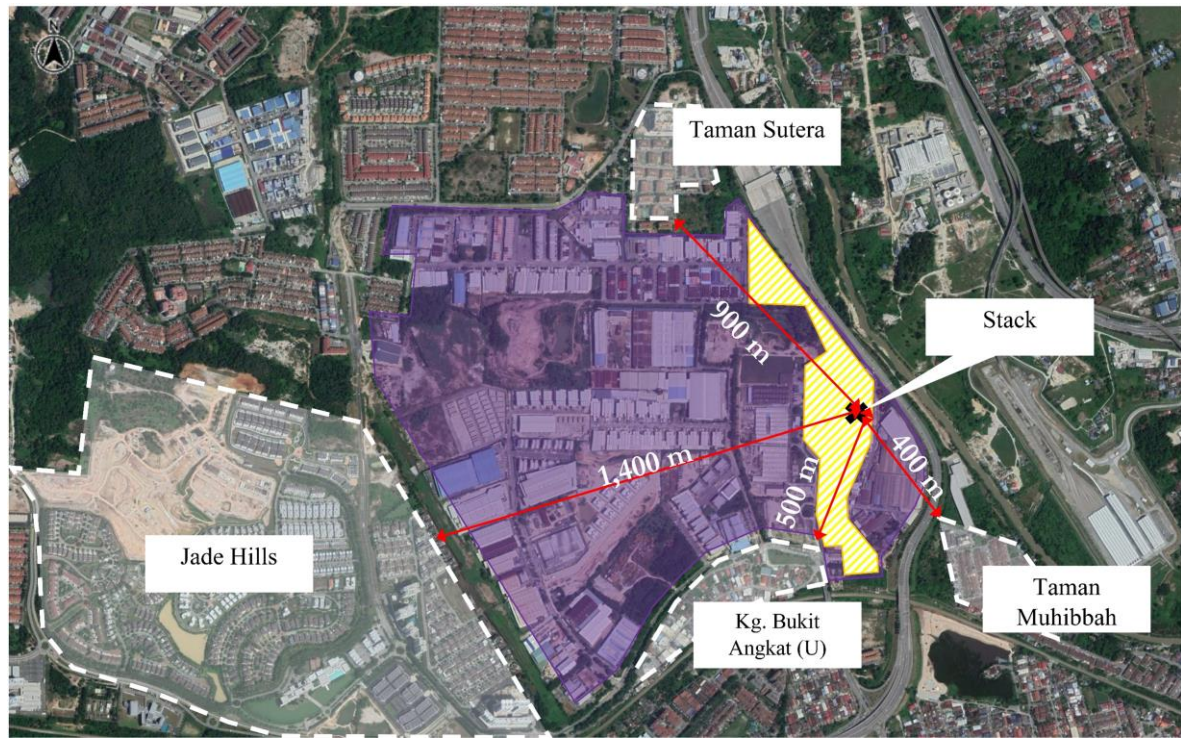


LOCATION OF PAPER MILL AND OFF-SITE RECYCLED PAPER STORAGE AREA



Boundary Coordinate of Paper Mill and Off-Site Recycled Paper Storage Area

1	3° 0' 24.58" N, 101° 46' 11.11" E	10	3° 0' 15.88" N, 101° 46' 17.38" E
2	3° 0' 8.30" N, 101° 46' 17.69" E	11	3° 0' 3.29" N, 101° 45' 34.39" E
3	3° 0' 1.60" N, 101° 45' 46.92" E	12	2° 59' 58.08" N, 101° 45' 37.51" E
4	3° 0' 0.59" N, 101° 46' 17.00" E	13	3° 0' 1.60" N, 101° 45' 46.92" E
5	2° 59' 48.47" N, 101° 46' 19.43" E	14	3° 0' 1.31" N, 101° 45' 54.89" E
6	2° 59' 45.83" N, 101° 46' 21.23" E	15	3° 0' 3.80" N, 101° 45' 55.02" E
7	2° 59' 47.90" N, 101° 46' 25.70" E	16	3° 0' 4.18" N, 101° 45' 46.99" E
8	2° 59' 51.94" N, 101° 46' 22.32" E	17	3° 0' 6.43" N, 101° 45' 46.23" E
9	3° 0' 5.25" N, 101° 46' 26.06" E		

DISTANCE HUMAN SENSITIVE RECEPTOS FROM PLANT STACK**NEW NORTH ENTRANCE FOR RAW MATERIAL FROM OFF-SITE STORAGE AREA TO PAPER MILL SITE**

STATEMENT OF NEEDS

- **Increasing Market Demand**
 - Corrugated Boxes Market Research Report published by Prescient and Strategic Intelligence Private Limited in 2020 predicted global corrugated boxes market to attain 4.3% compound annual growth from 2019 to 2030
- **Sustainable Paper Production (compare to virgin paper production)**
 - Save approximately 17 trees/tonne paper produced and prevent deforestation
 - Reduce approximately 30 m³ water/tonne paper produced
 - Consume approximately 70% less energy
 - Cut 0.35 tonnes CO_{2eq}/tonne paper produced
- **Employment Commitment and Opportunity**
 - Current employment : 450 workers
 - Additional workers required after upgrading : 300 workers (80% local)
- **Contribution to National Economy**
 - MUDA Group generated RM 1.5 billion in 2019 → tax contribution RM 25 million
 - Increase production rate → expected higher revenue and tax contribution
- **Support Local Grown Leading Company**
 - Locally grown company since 1971
 - Export to overseas market → strengthen international market
- **Plant Modernization**
 - Replace old machinery with high efficiency system (less water and energy consumption)
- **Implementation of Cradle-to-Cradle Concept**
 - Material and energy recovery of waste
 - Send solid fuel boiler ash as raw material for brick making

BACKGROUND OF EXISTING PLANT

- **Corrugating Medium and Test Liner**
 - Five (5) production lines (PM1, PM3, PM4, PM5 and PM6)
 - Production component: Stock preparation → Paper machine → Finishing
 - Production capacity: 800 tonnes/day
- **Raw Water Extraction and Treatment Plant**
 - Raw water extraction : 15,100 m³/day (15.1 MLD) (from Sg. Langat)
 - Raw water treatment plant capacity : 20,000 m³/day (20 MLD)
- **Effluent Generation and Treatment Plant**
 - Effluent source : paper production lines
 - Effluent generation : 13,315 m³/day (13.315 MLD)
 - IETS capacity : 25,000 m³/day (25 MLD)
- **Heat and Power Generation Unit**
 - 3 natural gas combined heat and power generation units
 - 2 natural gas package boilers
 - 3 solid fuel boilers

PLANT UPGRADING CONCEPT

- **Increasing of Production Rate**
 - Dismantle two (2) existing production lines (PM1 & PM3)
 - Install six (6) new wet pulp board lines
 - Production rate increase from 800 tonnes/day → approximately 4,500 tonnes/day
- **Upgrading of Existing IETS**
 - Expected increasing of COD in effluent → upgrade system to ensure compliance to Environmental Quality (Industrial Effluent) Regulations 2009
 - Proposed upgrading → add Up flow Multi-stage Anaerobic Reactor (UMAR)
- **Construction of New Sewage Treatment**
 - Expected increasing sewage generation: 300 new workers (90 P.E.)
 - Construct new small sewage treatment plant (SSTP)
 - New SSTP capacity: 100 P.E
- **Construction of New Outthrow Recycling Facility**
 - Outthrows is materials that are not suitable for the production of paper and board
 - Outthrow generation from future production lines : 164 tonnes/day
 - Recycling facility separates recyclables (plastics, metals and fibre) and non-recyclables (residue)
- **Construction of Covered Structure at Off-Site Recycled Paper Storage Area**
 - Currently recycled paper stored at open site
 - Construct roof to protect recycled paper from wind and rain
- **Open New Additional North Mill Entrance**
 - Reduce traffic congestion at existing South entrance

PLANT IMPROVEMENT CONCEPT

- **Waste Management**
 - Material recovery of paper production outthrow
 - Energy recovery of effluent treatment sludge
 - Proper disposal of raw water treatment sludge (currently pump back to Sungai Langat)
 - Cradle – to – cradle of solid fuel boiler ash → send for raw material of brick making (currently sent to prescribed premises i.e. Amita Berjaya Sdn. Bhd.)
- **Material Recovery of Paper Production Outthrow**
 - Outthrow mainly consists of recyclables (60%) i.e. plastics, metals and fibre
 - Plastics and metals → recycling merchant, fibre → recycle to production lines
- **Energy Recovery from Effluent Treatment Sludge**
 - Daily sludge generation and existing management:
 - 40 tonnes primary effluent sludge/day → recycled to PM 6 (fibre recovery)
 - 10 tonnes secondary effluent sludge/day → disposal to sanitary landfill
 - Management improvement: energy recovery at existing solid fuel boiler

PLANT IMPROVEMENT CONCEPT

• **Water Saving Program**

- Existing raw water requirement : + 15,100 m³/day
- New wet pulp board requirement : + 7,700 m³/day
- Dismantle PM1 and PM 3 : - 3,000 m³/day

- Total raw water requirement after upgrading : 19,200 m³/day

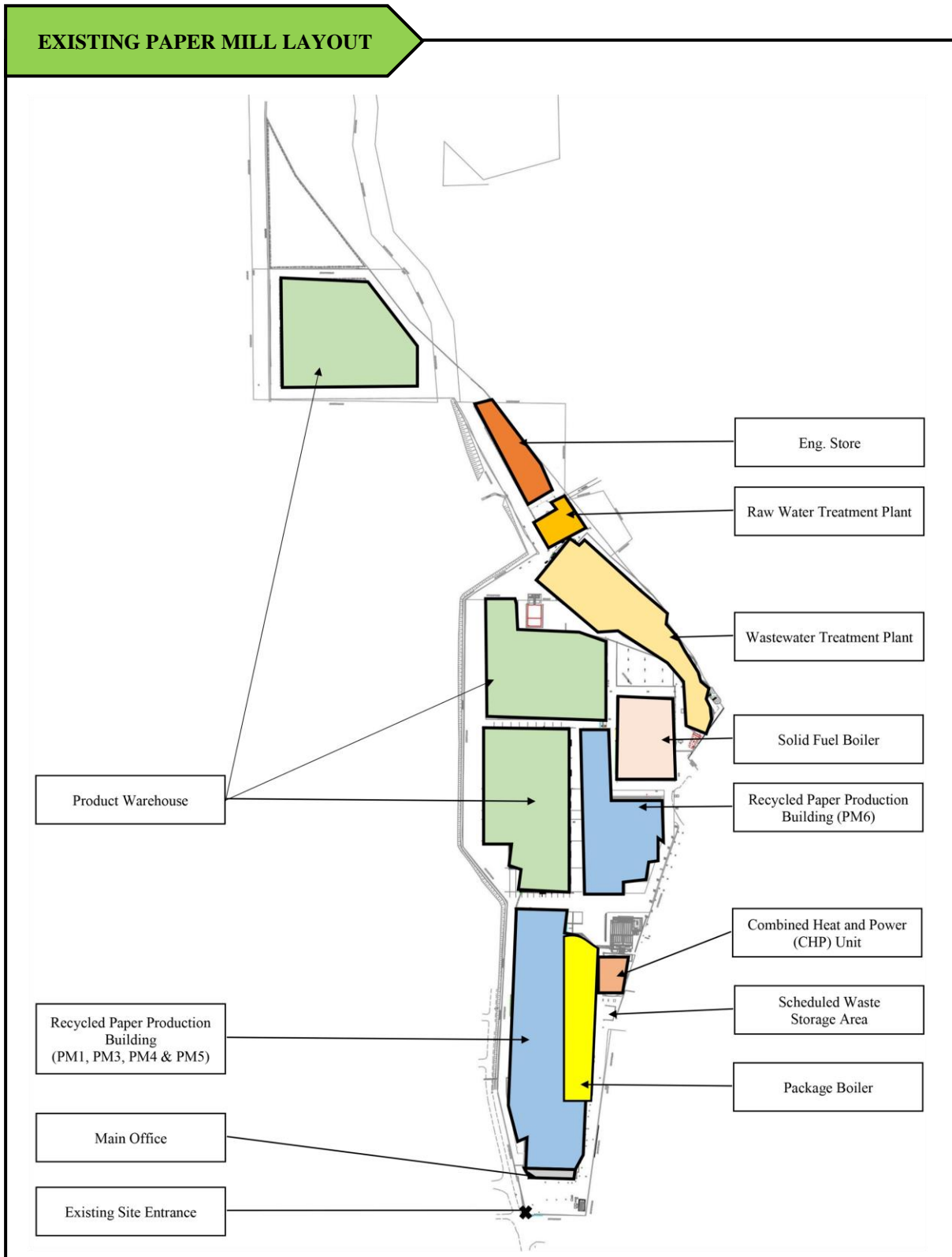
- Water saving initiatives : - **3,500 m³/day**
 - Increase water recycling within production process
 - Replace old liquid ring vacuum pump with turbo blower
 - Rainwater harvesting

- Water requirement after implementation of water saving : **16,300 m³/day**

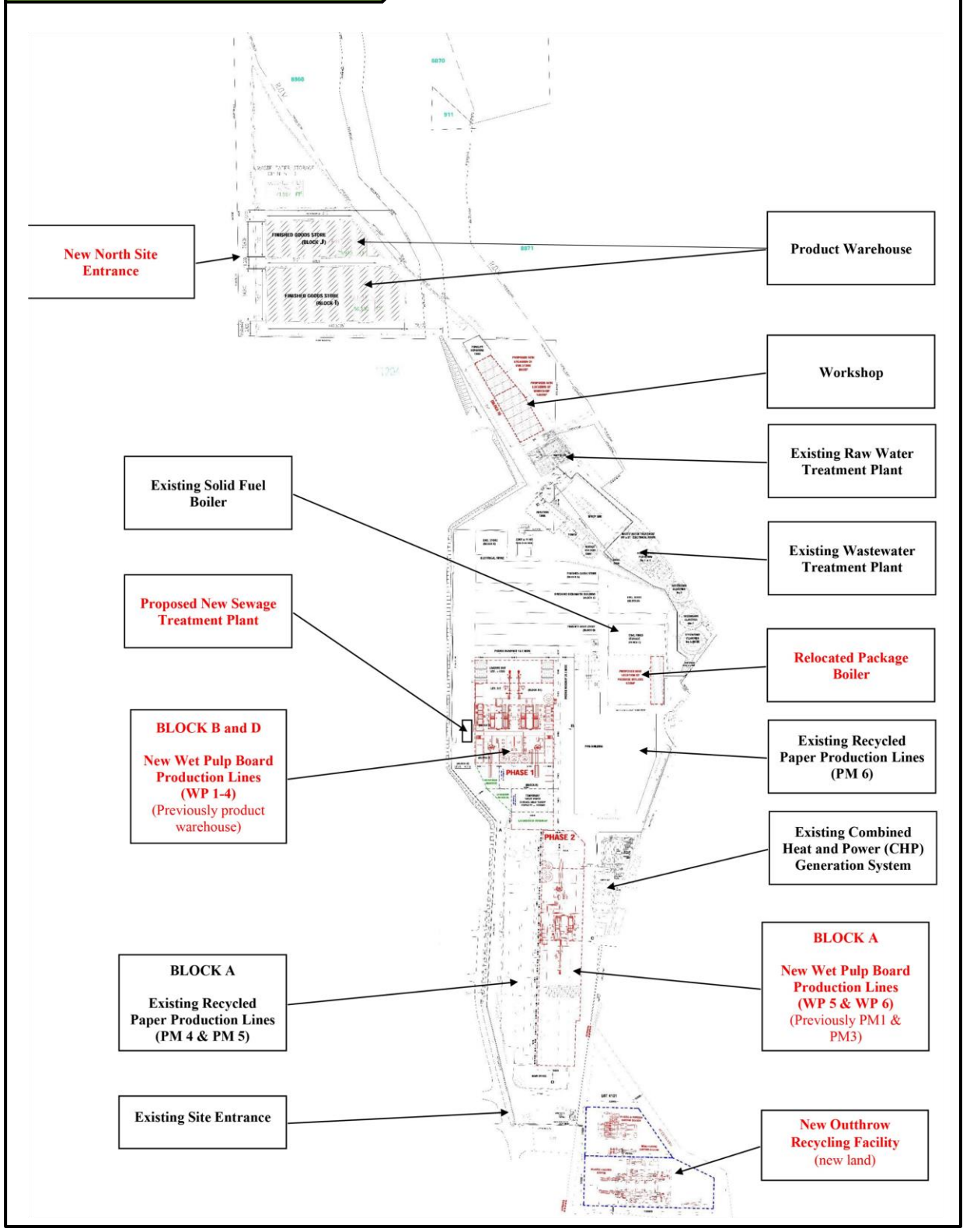
LAYOUT OF OFF-SITE RECYCLED PAPER STORAGE AREA

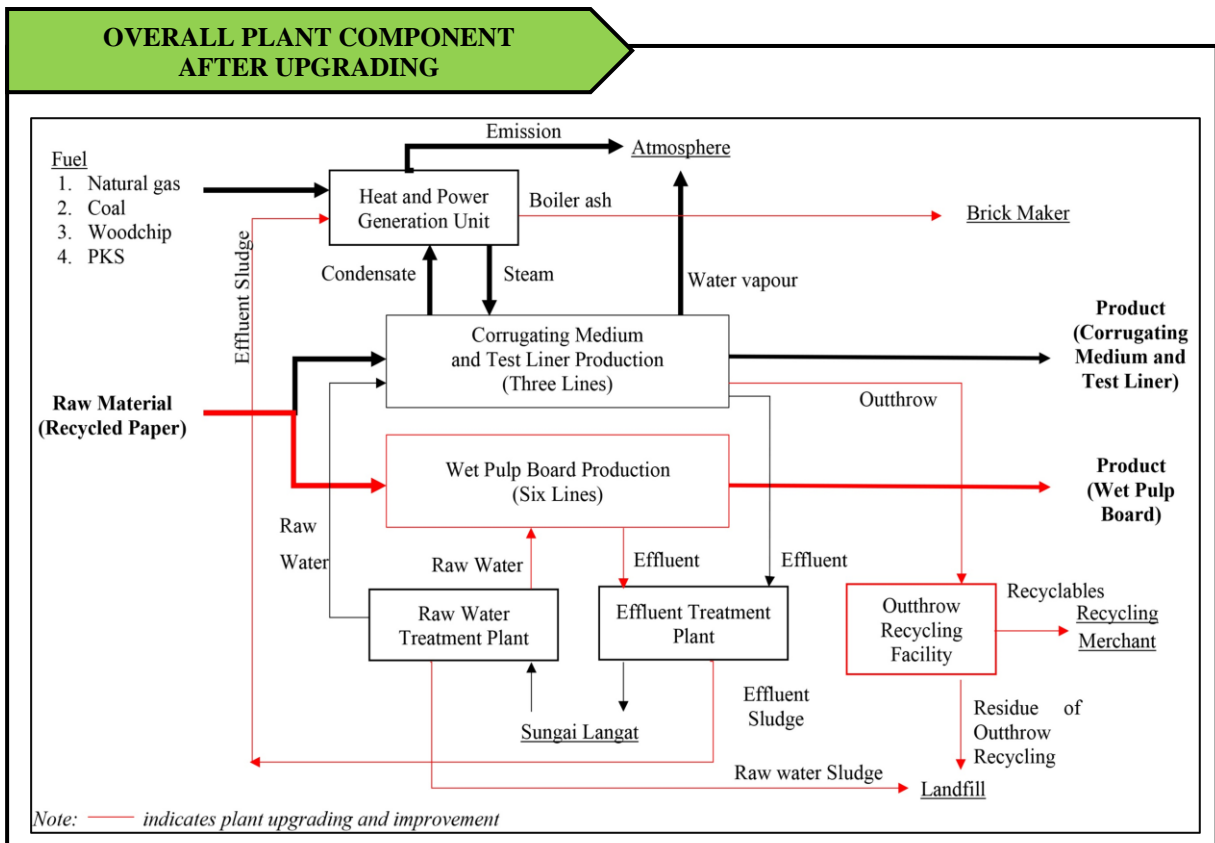
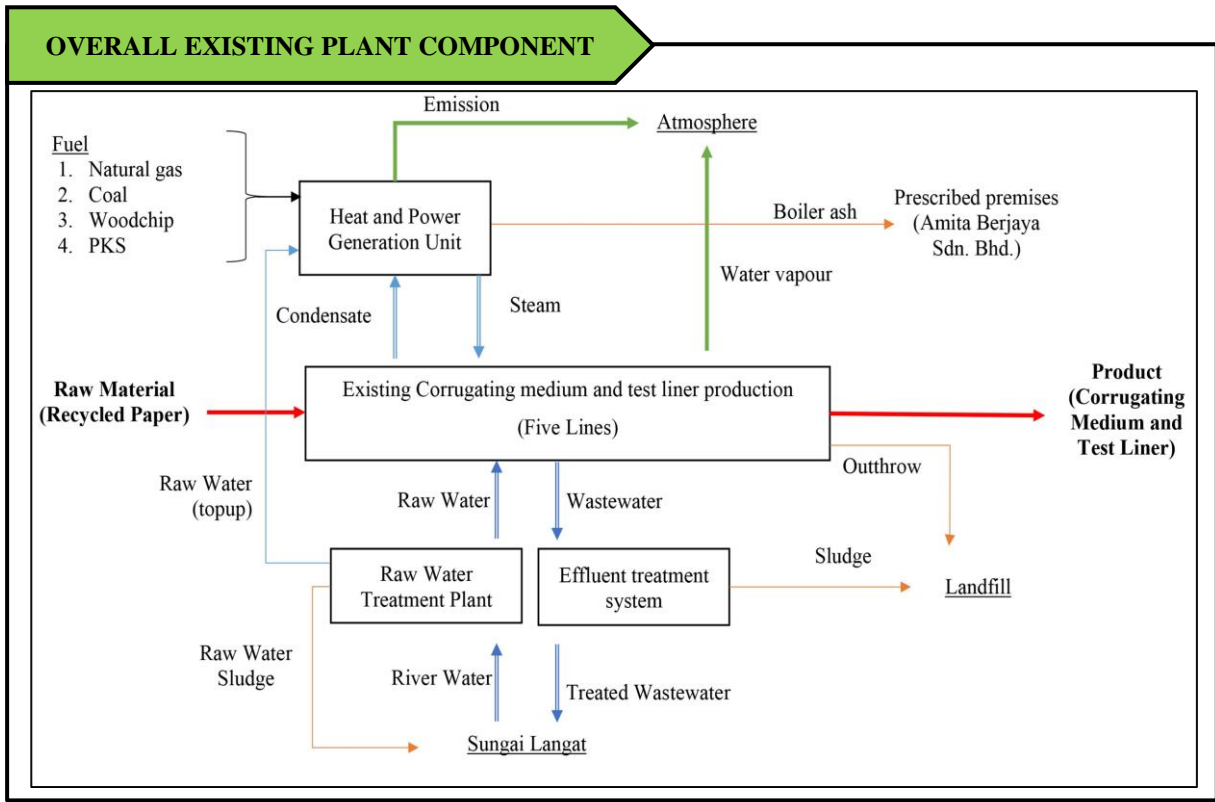


Note: The proposed future loading bay is currently storage area with 10,000 tonnes recycled paper capacity



**PROPOSED PAPER MILL LAYOUT
AFTER PLANT UPGRADE**

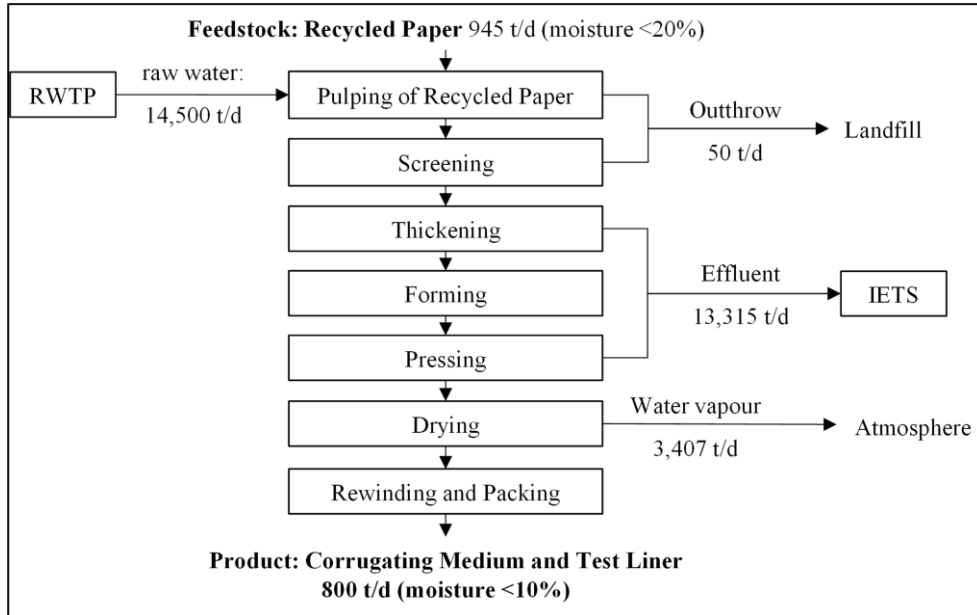




PROJECT DESCRIPTION – EXISTING PRODUCTION LINE

Existing Corrugating Medium and Test Liner Production

- Five (5) existing production lines



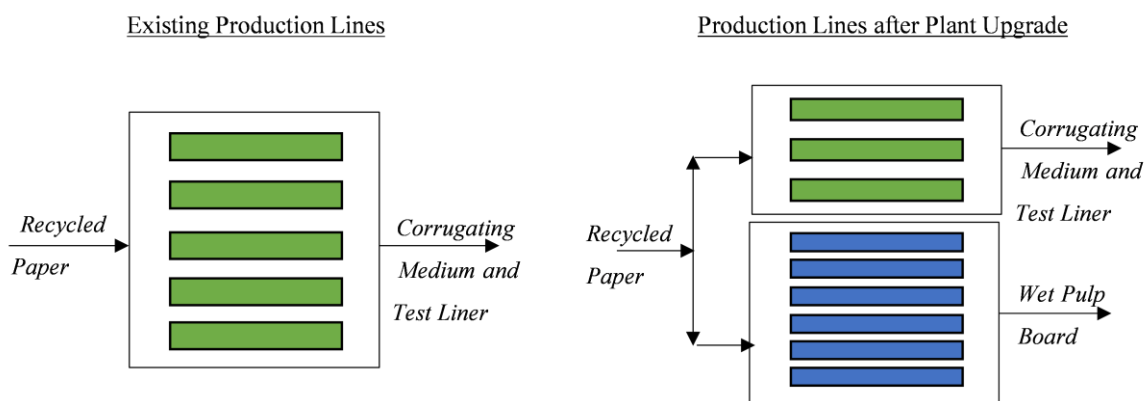
Environmental Performance of Existing Corrugating Medium and Test Liner Production

- Air emission : Water vapour from drying process (only physical process)
- Effluent generation : Effluent from thickening and pressing → send to IETS for treatment
- Waste generation : 50 tonnes outthrow/day (disposal at landfill)

PROJECT DESCRIPTION – UPGRADE OF PRODUCTION LINE

Production after Plant Upgrade

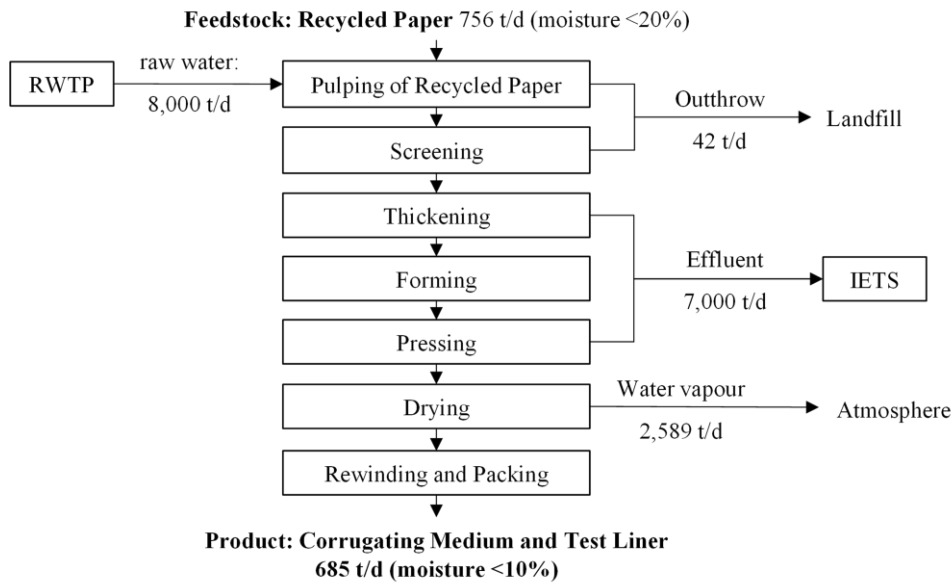
- Three (3) corrugating medium and test liner production (dismantle 2 lines, PM 1 and PM 3)
- Six (6) new wet pulp board production lines
 - Similar process to existing production except without drying



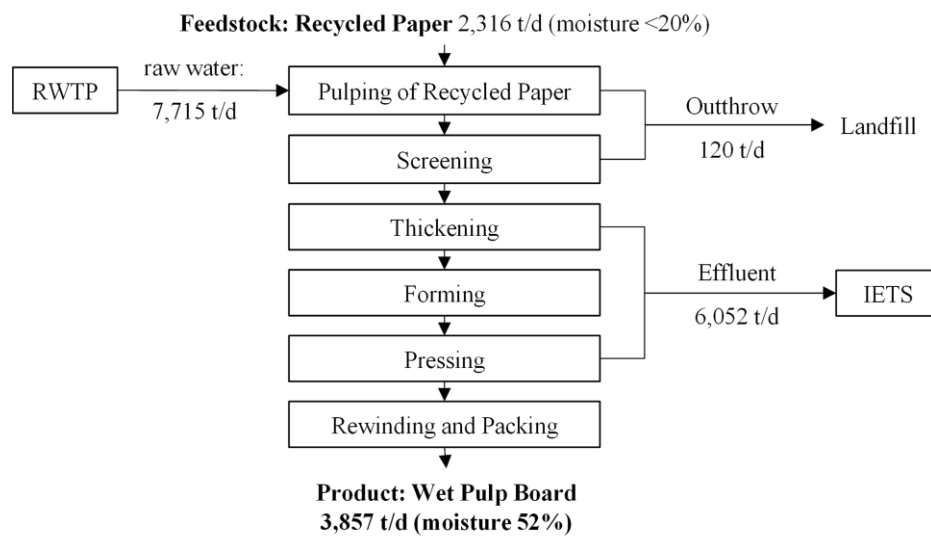
Comparison of Existing and Production Lines After Plant Upgrade

PROJECT DESCRIPTION – UPGRADE OF PRODUCTION LINE

Corrugating Line and Test Liner Production After Plant Upgrade



New Wet Pulp Board Production



Changes in Product, Recycled Paper Feedstock, Raw Water Consumption, Effluent and Waste Generation

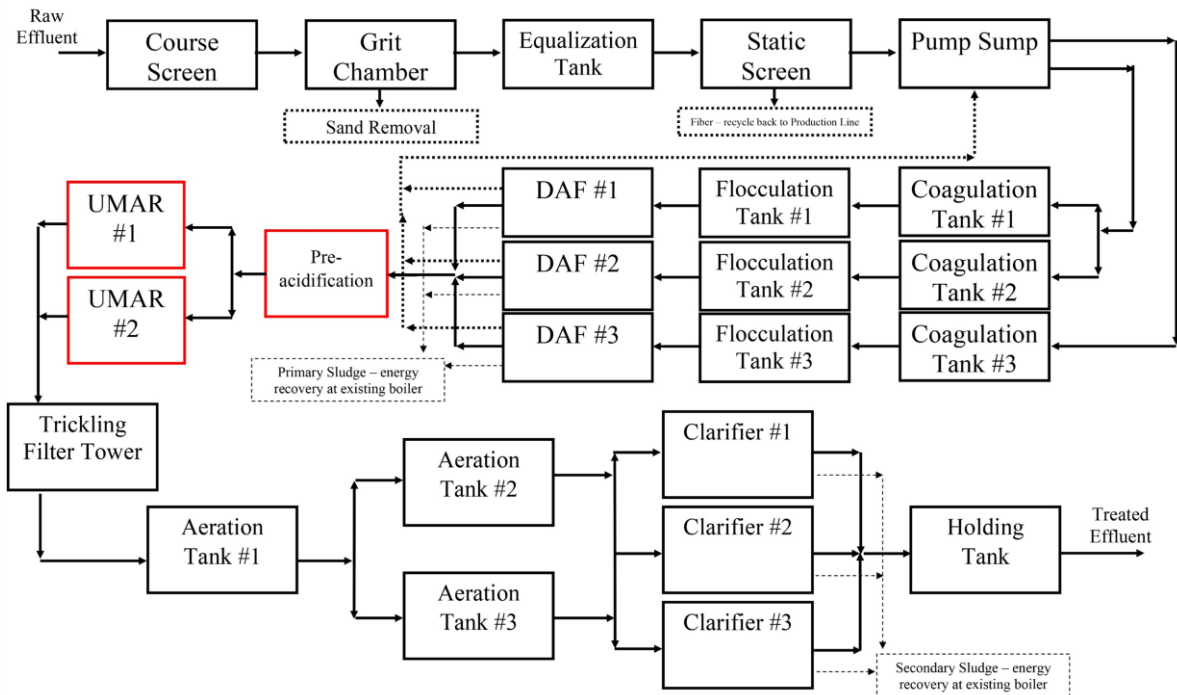
Item	Existing Consumption/ Generation (tonnes/day)	Consumption/ Generation After Plant Upgrade (tonnes//day)
Product Generation	800	4,542
Recycled Paper Feedstock Requirement	945	3,072
Raw Water Consumption*	15,100	16,300
Effluent Generation	13,315	13,052
Outthrow Generation	50	162

* Existing Raw Water Treatment Plant capacity i.e. 20,000 m³/day is able to cater the increasing volume of water requirement

PROJECT DESCRIPTION – PROPOSED IETS UPGRADE

Proposed IETS Upgrade

- Expected increase in COD concentration
- Proposed to install up-flow multi-stage anaerobic reactor (UMAR) to the existing IETS



PFD of IETS After Upgrading

PROJECT DESCRIPTION – SOLID FUEL BOILER

Solid Fuel Boiler System

- Quantity : 3 units
- Boiler system : Bubbling fluidized bed
- Existing fuel consumption : Bituminous coal, woodchip, palm kernel shell (PKS)
- Process control : Temperature < 900 °C (low NOx formation)
- Air pollution control : Bag filter
- Monitoring system : Continuous Emission Monitoring System (CEMS)
- Steam generation : 25 tph/boiler (for drying process at paper production line)

Environmental Performance: Emission from Solid Fuel Boiler

- Emission complies to Environmental Quality (Clean Air) Regulations 2014

**PROJECT DESCRIPTION –
SOLID FUEL BOILER**

Proposed Plant Improvement: Energy Recovery of Effluent Treatment Sludge

- Effluent sludge has been sent for TCLP analysis at SIRIM - no significant toxic chemicals
- Effluent treatment sludge has low sulphur, nitrogen and chlorine content
- Limestone (CaCO₃) is added during dewatering to increase the water removal. This CaCO₃ will aid in acid gas i.e., SO₂ removal in the solid fuel boiler
- Eliminate storage of effluent treatment sludge → eliminate odour source
- Trial burn was conducted to assess the emission after the fuel change
- Emission complied to Environmental Quality (Clean Air) Regulations 2014

Result of Emission Performance for Solid Fuel Boiler during Trial Burn

Parameter	Units	Concentration of Pollutant (corrected to 6% O ₂)	Solid fuel Boiler limit (6% O ₂)
Particulate matter	mg/Nm ³	8	50
Hydrogen chloride	mg/Nm ³	2.5	100
Hydrogen fluoride	mg/Nm ³	0.01	15
Carbon monoxide	mg/Nm ³	120	200
Sulfur dioxide	mg/Nm ³	80	500
Nitrogen dioxide	mg/Nm ³	180	500
Mercury	mg/Nm ³	0.0003	0.03
PCDD/ PCDF	nTEQ/Nm ³	0.019	0.1

**PROJECT DESCRIPTION –
NEW OUTTHROW RECYCLING FACILITY**

Outthrow Recycling System

- Consist of two stage recycling
 - Stage 1 : Separate metals and big size rigid plastics (i.e. PET and HDPE)
 - Process : Magnetic iron removal & and vortex current and manual separation
 - Stage 2 : Separate plastic, fibre and residue
 - Process : Gravitational separation
- Recyclables (i.e. plastic, wire and metals) → sell to recycling merchant
- Fibre → recycle to production lines
- Residue → disposal to landfill

Location of New Outthrow Recycling Facility

- Will be constructed at new adjacent site from paper mill site
- Require earthwork
 - Site relatively flat



PROJECT DESCRIPTION – WASTE GENERATION AND MANAGEMENT

Waste	Existing Generation and Management	Future Generation and Proposed Management After Plant Upgrading
Solid Waste		
Production Outthrow	50 t/d Dispose at landfill	162 t/d Material recovery at new outthrow recycling facility
Scheduled Waste		
Primary effluent treatment sludge	40 t/d Recycle to production line	Energy recovery at existing solid fuel boiler
Secondary effluent treatment sludge	10 t/d • Approved special management • Dispose at landfill	
Raw water treatment sludge	4 t/d Pump to Sg. Langat	4 t/d • Apply special management • Dispose at landfill*
Solid fuel boiler ash	4 t/d/boiler Send to prescribed premises	4 t/d/boiler • Apply special management • Send to brick maker as raw material
Other scheduled waste (e.g. SW305, 306)	Approx. 0.05 t/d Send to prescribed premises	Approx. 0.05 t/d Send to prescribed premises

PROJECT ACTIVITIES

Pre-Construction of Upgrading Project

- Application of approval from authorities
- Designing and planning of upgrading project

Construction Phase of Upgrading Project

- Demolition and construction of buildings for installation of new wet pulp lines
- Land clearing and earthwork at new site for new outthrow recycling facility
- Construction of outthrow recycling facility
- Land clearing, earthwork and construction of covered structure at off-site recycled paper storage area
- Upgrading of existing IETS – installation of UMAR system

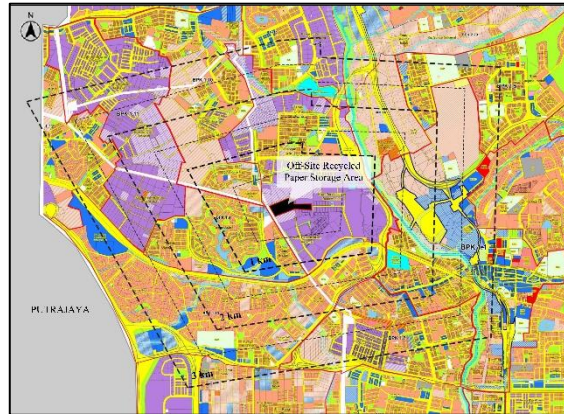
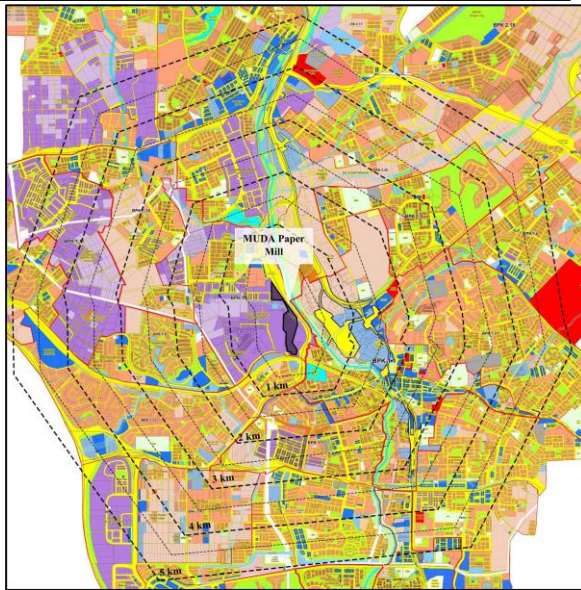
Operational Phase after Upgrading Project

- Corrugating medium and test liner, and wet pulp board production
- Raw water treatment
- Effluent treatment
- Heat and power generation
- Outthrow recycling
- Transportation of recycled paper and product

Decommissioning Phase

- Plant demolition
- Site rehabilitation

ZONING OF PROJECT SITE



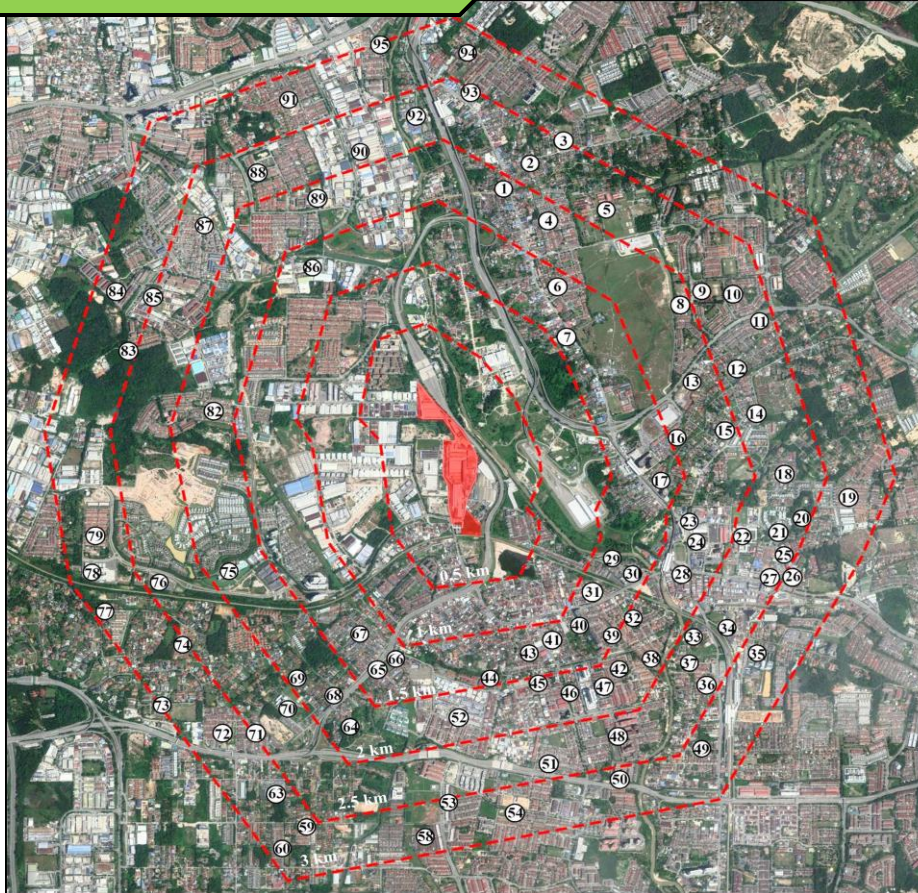
LEGEND

	Project Site		Commercial
	Existing Industry		Proposed Commercial
	Proposed Industry		River/Lake
	Residential		Roadway
	Proposed Residential		

SURROUNDING SENSITIVE RECEPTORS WITHIN 1 KM



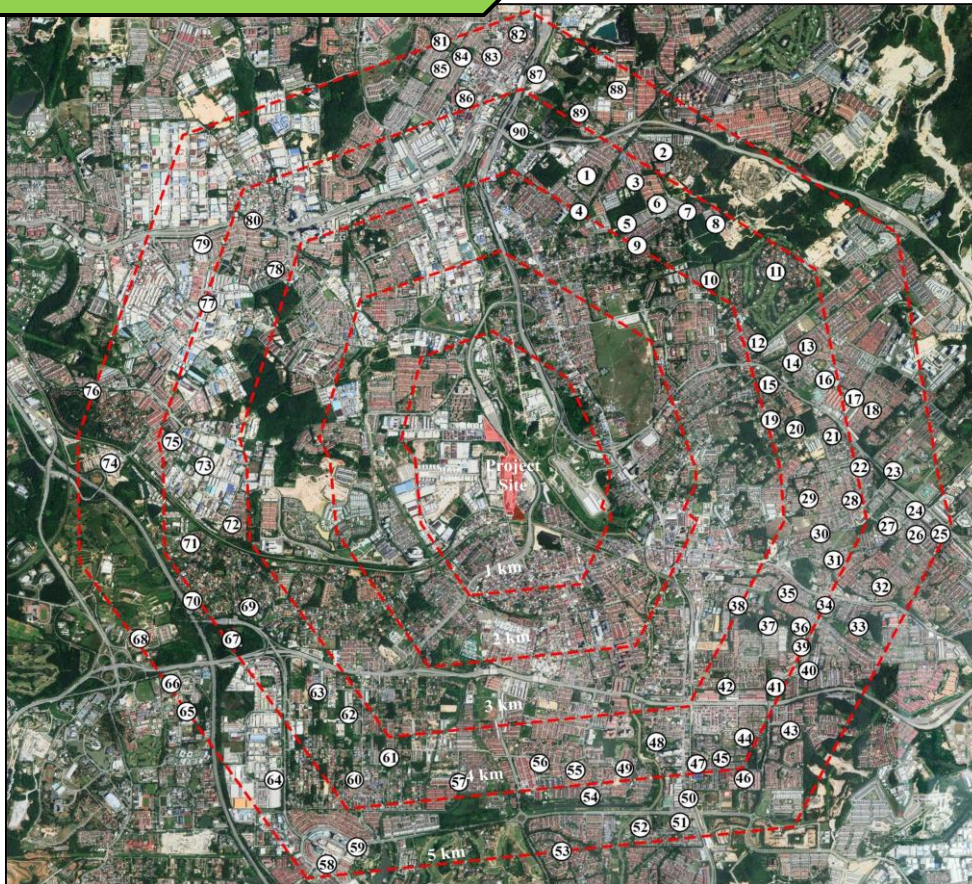
**SURROUNDING SENSITIVE RECEPTORS
WITHIN 1 - 3 KM**



List of Human Sensitive Receptor within 1 – 3 km from Paper Mill Site

1. Masjid Sungai Sekamat	25. Sentosa Heights	49. Taman Hijau	73. Sekolah Menengah Kebangsaan Maahad Hamidah
2. Taman Sekamat Indah	26. Sekolah Kebangsaan Jln Semenyih	50. Taman Kajang Indah	74. Widuri Villas
3. Kampung Sungai Sekamat	27. Kajang Hospital	51. Taman Kajang Raya	75. Jade Hills
4. Taman Delima	28. Taman Jambu	52. Pusat Perindustrian Sungai Chua	76. Eaton International School
5. Kampung Sungai Kantan	29. Kampung Sri Jambu	53. Bandar Baru	77. Genesis Education Center Sdn Bhd
6. Taman Mesra	30. Taman Sri Jambu	54. Taman Putra Kajang	78. Pangsapuri Gapura Bayu
7. Kampung Batu 13	31. Kg Baru Sungai Chua	55. Taman Kajang Mewah	79. Jade Terrace
8. Sekolah Kebangsaan Saujana Impian	32. Taman Kajang Baru	56. Damai D'dahlia Homestay	80. Taman Puncak Utama
9. Sekolah Menengah Kebangsaan Saujana Impian	33. Taman Sungai Mas	57. Minhu Homestay Bangi	81. Kawasan Perindustrian Balakong Jaya
10. Saujana Impian	34. Sekolah Menengah Kebangsaan Convent (M)	58. Taman Kajang Impian	82. Desa Karun Mas
11. Taman Impian Jaya	35. Kolej New Era	59. Kampung Sungai Ramal Dalam	83. Taman Sinaran
12. Taman Melor	36. Taman Mahkota	60. Taman Ramal Desa	84. Taman Setia Balakong
13. Masjid Saujana Impian	37. Taman Jelita	61. Kampung Sungai Ramal	85. Taman Industry Balakong Jaya
14. Sekolah Rendah Agama Sungai Kantan	38. Taman Seri Emas	62. Taman Ramal Suria	86. Simpang Balak Industrial Area
15. Kampung Sungai Kantan	39. Desa Bunga Raya	63. Taman Desa Dahlia	87. Kawasari Apartment
16. Taman Sri Kantan	40. Taman Seri Kota	64. Sungai Ramal Luar	88. Taman Cheras Jaya
17. Kpj Health Berhad	41. Taman Sri Saga	65. Kampung Sungai Ramal Luar	89. Sekolah Kebangsaan Cheras Jaya
18. Taman Desa Ros	42. Taman Bidara	66. Sekolah Kebangsaan Leftenan Adnan	90. Kawasan Perindustrian Cheras Jaya
19. Taman Kajang Mulia	43. Desa Kekwa	67. Kampung Sungai Ramal Baru	91. Masjid Taman Cheras Jaya
20. Kuarters Jabatan Kerja Raya	44. Kampung Sungai Chua	68. Masjid Jamek Haji Mat Saman	92. Kampung Bukit Dukong
21. Sentosa Villas	45. Taman Setia	69. Taman Bukit Meringin	93. Taman Koperasi Cuepacs
22. SMJK Yu Hua	46. Taman Berjaya	70. Sekolah Menengah Kebangsaan Sungai Ramal Kajang	94. Taman Desa Baru
23. Masjid Jamek Bandar Kajang	47. Taman Berjaya Baru	71. Taman Sri Ramal	95. Taman Sri Indah
24. Kajang Plaza Medical Centre	48. Taman Sepakat Indah	72. Taman Ramal Indah	96. Columbia Asia Hospital

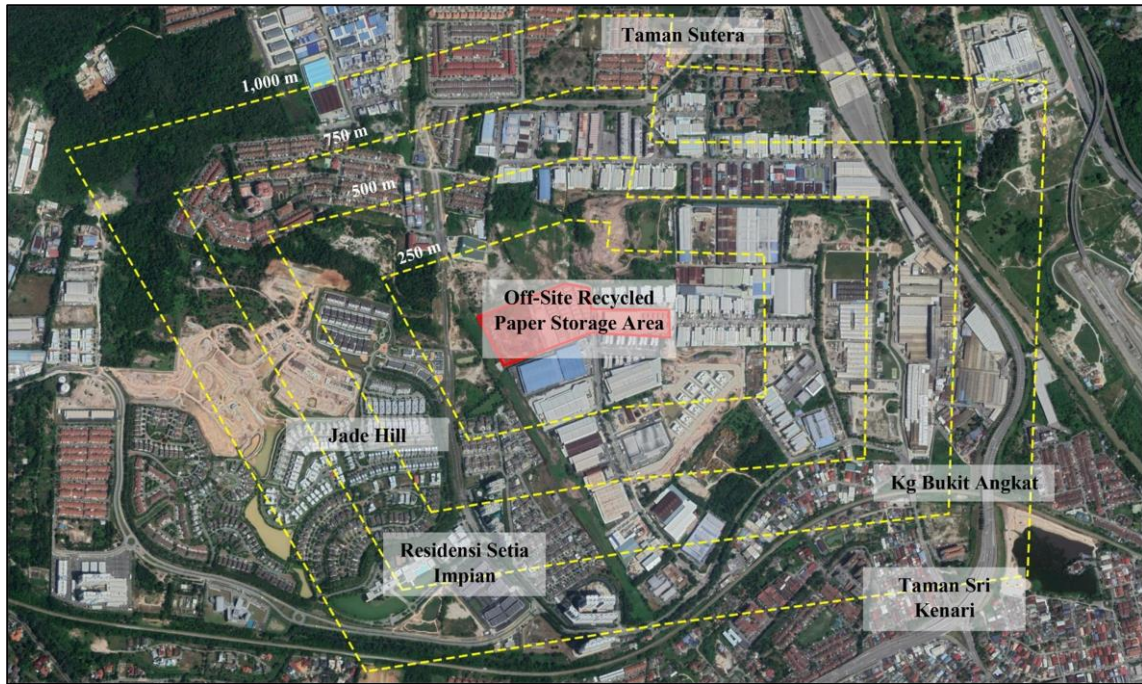
**SURROUNDING SENSITIVE RECEPTORS
WITHIN 3 - 5 KM**



List of Human Sensitive Receptors within 3 – 5 km from Paper Mill Site

1. Pangsapuri Mewah Cheras	24. Klinik Haiwan Dan Surgery Kitty's Care	47. Pangsapuri Suria	70. Surau An-Nur Centre
2. SK Taman Rakan	25. Taman Kajang Perdana Apartment	48. Taman Sri Langat Flat Block A	71. Country Heights
3. Taman Suria	26. Surau Al Asmah	49. Taman Sri Melor	72. Taman Puncak Utama
4. Taman Lingkaran Nur	27. Villa GS Azalea	50. Genius Aulad Pre-School Saville	73. Kawasan Perindustrian Balakong Jaya
5. Tropicana Cheras, Link Villas	28. Pangsapuri Sri Indah	51. SMK Jln Reko	74. Green Park Residence Condominium
6. Permata Residence	29. Kafa Hidayatul Iman	52. Surau Al-Hidayah	75. Taman Balakong Jaya
7. Taman Kasih	30. Ideal Tuition Centre	53. Rainy Bunch Pre-School	76. Bukit Gita Bayu
8. Pangsapuri Seri Sekamat	31. Sri Sentosa Condominium	54. Sri Tanjung Apartment	77. Taman Industry Selesa Jaya
9. Taman Sekamat	32. Taman Restu	55. Surau Darul Mahabbah	78. Kampung Kenangan Indah
10. SK Saujana Impian 2	33. Tiara Residence	56. SK Seksyen 7 Bandar Baru Bangi	79. Taman Taming Jaya
11. Liu Mansion	34. Taman Zamrud	57. Taman Desa Surada	80. Kampung Baru Balakong
12. Rainy Bunch Saujana Impian Kajang 2	35. Surau An-Naim	58. Hospital Islam Az-Zahrah	81. SMK Cheras Perdana
13. Taman Taming Impian	36. Mutiara Apartment	59. Bandar Baru Bangi	82. Cheras Batu 11
14. Tadika Anugerah	37. Lung Thian Kung Temple	60. Kampung Sungai Ramal Dalam	83. Taman Indah
15. Masjid Jamek Pekan Kajang	38. Pangsapuri Ria	61. SK & SMK Islam ABIM	84. Cheras Perdana Apartment
16. Taman Jenaris	39. Taman Bukit Mutiara	62. Kampung Sungai Ramal	85. Cheras Perdana
17. Masjid Prima Saujana	40. Taman Bukit Mewah	63. Taman Ramal Suria	86. Taman Kasturi
18. Prima Saujana	41. Tiara Park Homes	64. Kawasan Perindustrian Miel	87. Kampong Perimbun
19. SK Sungai Kantan 3	42. Taman Kajang Jaya	65. Unipark Condominium	88. Resilion Residence
20. Taman Saujana Emas	43. Sutera Apartment	66. De Centrum Residences	89. Rumah Seri Kenangan Cheras
21. Saujana Villa	44. Taman Kajang Utama	67. Tanarata Int. Schools	90. Landmark Residence 2
22. Homestay Indah Kajang	45. Taman Aman Utara	68. Fakulti Pertanian UPM	
23. Penjara Kajang	46. PRIMA @ Kajang Utama	69. Ibnu Sina Wellness	

SURROUNDING SENSITIVE RECEPTORS



EXISTING ENVIRONMENT - CLIMATE AND METEOROLOGY (2009 – 2019)

Rainfall Distribution

Highest rainfall: November (331.5 mm)
 Lowest rainfall: February (105.4 mm)

Rain Days

Most rainy days: November (21 days)
 Least rainy days: February (10 days)

Temperature

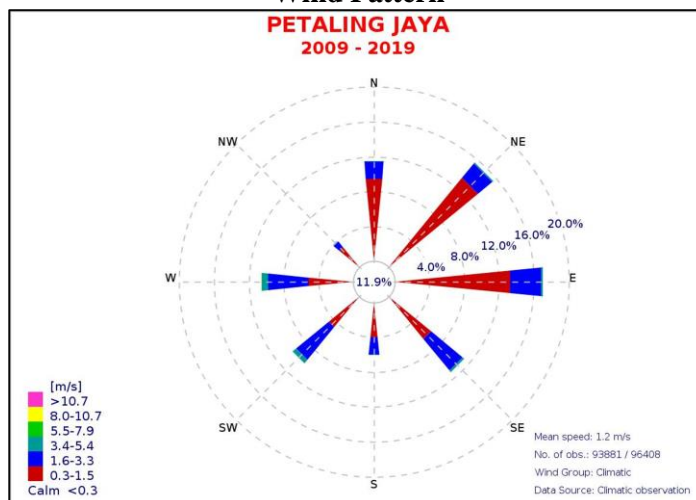
Consistent temperature: 25.5 – 26.7 °C

Relative Humidity

Between 73.6% - 84.6 %

Wind Pattern

PETALING JAYA
 2009 - 2019



**EXISTING ENVIRONMENT -
AMBIENT AIR QUALITY**
**Summary of Ambient Air Quality (30th Oct – 4th Nov 2021)
at Project Site and Surrounding Human Sensitive Receptors**

Air Pollutants	Concentration ($\mu\text{g}/\text{m}^3$)					Standard*
	A1 Project Site	A2 Tmn Selamat	A3 Jade Hills	A4 Kg Bkt Angkat	A5 Tmn Sutera	
TSP	142	96	110	102	99	260**
PM ₁₀	50.9	20.1	41.1	31.4	34.7	100
PM _{2.5}	13.9	<1.0	<1.0	<1.0	13.9	35
SO ₂	4	<2	<2	4	2	80
NO ₂	<2	<2	<2	<2	<2	280
CO	<0.1	<0.1	<0.1	<0.1	<0.1	30

* Malaysian Ambient Air Quality Standard 2020

** Recommended Malaysia Ambient Air Quality Standard 1989

**EXISTING ENVIRONMENT -
ODOUR**
Summary of Odour Monitoring (1st – 3rd Nov 2021) at Surrounding Human Sensitive Receptors

Sampling Location	Intensity Level (I _{mean})	Offensiveness	Odour Description	Remarks
O1: Kg Bkt Angkat	1	Neutral	Vehicle combustion smell	Near to main road
O2: Pangsapuri Tmn Tasik Sg. Chua	0	Neutral	No odour	-
O3: Jade Hills	1	Neutral	Vehicle combustion smell	Near to main road
O4: Tmn Selamat	0	Neutral	No odour	-
O5: Tmn Sutera	1	Neutral	Vehicle combustion smell	Near to main road
O6: Tmn Sepakat Indah	0	Neutral	No odour	-
O7: Residensi Setia Impian	0	Neutral	No odour	-

Note: 6 = extremely strong odour, 0 = no odour

**EXISTING ENVIRONMENT -
NOISE LEVEL**
**Summary of Existing Noise Level (30th Oct – 4th Nov 2021)
at Project Site and Surrounding Human Sensitive Receptors**

Sampling Location	Noise Level (dBA)			
	Daytime	Guidelines*	Nighttime	Guidelines*
N1: Project Site	68.4	75	67.4	75
N2: Kg. Bkt. Angkat	52.3	65	46.8	60
N3: Tmn Sutera	50.2		45.7	
N4: Jade Hills	54.4		51.6	

* Recommended Permissible Sound Level for Urban Area, Second Schedule, Guidelines for Environmental Noise Limits and Control, 2019

EXISTING ENVIRONMENT - TOPOGRAPHY AND GEOLOGY & SOIL

- Relatively flat terrain
- Developed area which comprise of industrial, commercial and residential areas
- Adjacent to SILK Highway and Sungai Langat
- Geology properties : mainly limestone and sandstone

EXISTING ENVIRONMENT - HYDROLOGY AND WATER INTAKE

- Located within Sungai Langat river basin
- Major tributaries: Sungai Lui, Semenyih and Labu
- Downstream water intake
 - Semenyih 2 Off-River Storage (20 km from MUDA Paper Mill)
 - Bukit Tampoi Water Treatment Plant (30 km from MUDA Paper Mill)
 - Labohan Dagang Water Treatment Plant (45 km from MUDA Paper Mill)
- MUDA extract approximately 15.1 MLD water from Sungai Langat

Summary of Sungai Langat Stream Profile

Station	Width (m)	Depth (m)	Velocity (m/s)	Flowrate (m ³ /s)
H1	16	1.8	0.57	16.46
H2	20	1.5	0.56	16.67
H3	42	1.3	0.31	17.04
H4	19	2.1	0.43	17.25
H5	34	2.4	0.22	18.13
H6	32	2.2	0.50	35.20
H7	35	2.8	0.36	35.00

EXISTING ENVIRONMENT - SURFACE WATER QUALITY

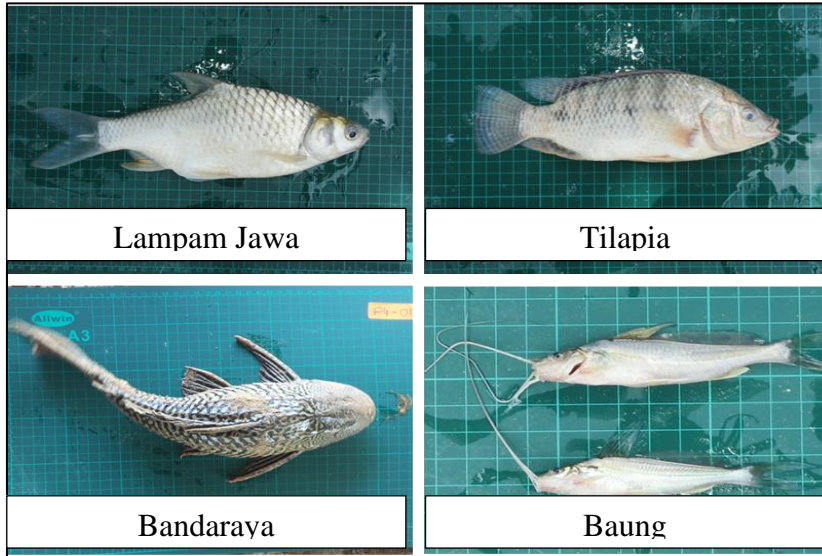
Summary of Surface Water Quality of Sungai Langat (6th October 2021)

Sampling Location	Monitoring Result						
	NWQS	WQI	pH	DO (mg/L)	BOD (mg/L)	COD (mg/L)	TSS (mg/L)
W1: Sg. Langat (upstream)	III	67.9	6.6	6.56	8	23	172
W2: Sg. Langat (1.5 km downstream)	III	62.3	6.6	3.74	8	25	175
W3: Sg. Langat (5 km downstream)	III	72.3	6.7	4.43	8	20	35
W4: Sg. Langat (15 km downstream)	III	58.7	6.6	4.73	12	25	115
W5: Sg. Semenyih (2 km before flowing into Sg. Langat)	III	60.8	6.6	5.98	12	43	124
W6: Sg. Langat (1 km after confluence with Sg. Semenyih)	III	71.9	6.7	5.42	7	18	75
W7: Sg. Langat (30 km downstream from project site, 1 km before Bukit Tampoi Water Intake Point)	III	72.5	6.7	6.10	8	22	60

- PFAS group and biocide were not detectable in the river water at sampling point W1, W2 & W7

EXISTING ENVIRONMENT - AQUATIC

- Only common fish species



EXISTING ENVIRONMENT - LAND TRAFFIC

Summary of Existing Traffic Condition for Intersections

Survey Station	Type of Control	Peak Hour	Peak Hour Volume (veh/hr)	Intersection LOS
TC1 5-arm junction in front of MUDA Paper Mill	Signalised	Morning	5,220	F
		Evening	2,619	F
TC2 4-arm junction connecting SILK Highway and Jalan Bukit Angkat	Signalised	Morning	4,224	F
		Evening	4,129	F
TC3 T-Junction connecting Jalan Bukit Angkat and Jalan Industri Kidamai	Signalised	Morning	1,566	E
		Evening	1,742	B

Summary of Existing Traffic Condition for Roadways

Survey Station	Direction	Peak Hour	Traffic Volume (veh/hour)	LOS
RD 1 Connected to existing south entrance	Inbound	Morning	1156	E
		Evening	848	E
	Outbound	Morning	1021	E
		Evening	1331	F
RD 2 Connected to proposed new additional north entrance	Both ways	Morning	449	N.A.
		Evening	383	N.A.

Note:

1. Inbound – traffic movements from TC2 towards Jalan Bukit Angkat
2. Outbound – traffic movements from Jalan Bukit Angkat towards TC2.
3. Traffic volumes on RD1 were recorded for three segments of the street, i.e., TC2–TC1 and TC1–TC3
4. N.A. – not applicable

**EXISTING ENVIRONMENT -
SOCIO ECONOMY**

- Nearest human sensitive receptors

No.	Human Sensitive Receptors	Distance from mill
1.	Kampung Bukit Angkat	West (0 - 0.5 km)
2.	Taman Sri Kenari	South-west (0 - 0.5 km)
3.	Taman Muhibbah	South-east (0 - 0.5 km)
4.	Taman Sutera	North-west (0 - 1 km)
5.	Pangsapuri Taman Tasik Sungai Chua	South-west (0 - 1 km)
6.	Kg Baru Sungai Chua	South-east (0 - 1 km)
7.	Jade Hill	North-west (1 - 2 km)
8.	Kampung Batu 13, Taman Sri Saga, Taman Bidara, Desa Kekwa, Kampung Sungai Chua	South-east (1 - 2 km)

- Survey sample: 311 respondents (minimum of 300 is targeted for the study to meet the 95% confidence level and 6 % confidence interval)
- Random survey within 5 km was conducted
- Survey findings: Majority of the respondents are
 - Male (62.4%)
 - Malay (64.7%)
 - Graduated from university (55.7%)
 - Aged between 36 – 55 years (58.5%)
 - Middle to upper income families, earn between RM 5,001 – RM 10,000 (26.1%)
 - Having family size between 4 – 6 people (68.7%)
 - Living in the area for more than 5 year (76%)

**EXISTING ENVIRONMENT -
PUBLIC HEALTH**

- The disease burden in the study district was low based on the incidence rate of notifiable diseases compared to Selangor and the national rates
- The area has adequate coverage of safe drinking supply, sanitary toilet and electricity
- Based on survey, the respondent
 - Use in-house pipe (57.2%)
 - Use flush toilet (96.1%)
 - Use municipal waste collection (99.4%)
 - Claimed not healthy in the past six months (40.1%)
 - Were admitted in hospital due to the health problem (15.1%)
- Health illness diagnosed by doctors in the past 6 months
 - Cough and cold, conjunctivitis, vomiting, chest pain, skin irritation, depression, dementia, fever and jaundice

**IMPACT EVALUATION, PROPOSED P2M2 AND RESIDUAL IMPACT –
AIR QUALITY****Construction Phase of Upgrading Project****Potential Impact**

- Insignificant impact on air quality
- Source of dust emission from movement of construction vehicles and construction activities
- Expected only 10 trucks per day for the construction material transportation
- Construction activities within developed industrial site
- Construction activities are temporary

Proposed P2M2

- To implement BMPs at construction areas

Operational Phase After Plant Upgrade**Potential Impact**

- Emission from solid fuel boiler – addition of effluent treatment sludge as fuel
- Characteristic of effluent treatment sludge
 - Low sulphur, nitrogen and chlorine content
 - No significant toxic chemicals (according to analysis by SIRIM)
- Thus, the new fuel mixture shall not emit hazardous air pollutant

Proposed P2M2

- To ensure the emission complies to the limits with continuous emission monitoring system (CEMS)
- The flue gas shall be treated by air pollution control system i.e. bag filter before being emitted into the atmosphere
- The presence of CaCO₃ in the wastewater treatment sludge as the filtering aid may reduce the emission of acid gases, particularly SO₂
- Stack emission compliance monitoring and filter bag performance monitoring shall be conducted

Residual Impact

- Based on air dispersion modelling, the 1-hr and 24-hr GLC for SO₂ and 24-hr and annual GLC for PM₁₀ for all modelling scenario at human sensitive receptors are within the Ambient Air Quality Standard 2020

IMPACT EVALUATION, PROPOSED P2M2 AND RESIDUAL IMPACT – ODOUR

Operational Phase After Plant Upgrade

Potential Impact

- Odour sources
 - Equalization tank : odour intensity 3 (rotten egg smell)
 - Outthrow storage area : odour intensity 3 (sour smell)
 - Primary effluent sludge holding tank : odour intensity 6 (rotten egg and pungent smell) (significant odour source)

- Finding of odour dispersion by sniff testing
 - Equalization tank odour not detected at 30 m from source
 - Outthrow storage odour not detected at 30 m from source
 - Primary effluent sludge holding tank odour not detected at 45 m from source

- Finding of odour dispersion by signature compound (H₂S) monitoring at significant odour source (primary effluent sludge holding tank)

Distance from Primary Effluent Sludge Holding Tank (m)	Concentration of H ₂ S (µg/m ³)	
	During Neutralizer Spraying	Without Neutralizer Spraying
0 (at primary effluent sludge holding tank)	514.63	622.35
20	4.43	11.68
50	0.00	0.01

Note: Odour threshold of H₂S: 0.2 µg/m³ (Source: WHO)

- Finding of odour dispersion by modelling from primary effluent sludge holding tank
- Odour impact is within 50 m from odour source (H₂S concentration ≥ 0.2 µg/m³)
 - Odour may be detected at SILK Highway near to primary effluent sludge holding tank
- H₂S concentration at human sensitive receptors are lower than odour threshold

Human Sensitive Receptors	Average GLC of H ₂ S During No Neutralizer Spraying (µg/m ³)		Average GLC of H ₂ S During Neutralizer Spraying (µg/m ³)	
	1-hr	24-hr	1-hr	24-hr
OSR1: Taman Selamat	0.040	0.005	0.030	0.005
OSR2: Jade Hill	0.013	0.001	0.010	0.001
OSR 3: Kg Bukit Angkat	0.080	0.008	0.060	0.008
OSR 4: Taman Muhibbah	0.080	0.008	0.060	0.008
OSR 5: Taman Sutera	0.040	0.003	0.030	0.003
OSR 6: Residensi Setia Impian	0.013	0.001	0.010	0.001

Note: Odour threshold of H₂S: 0.2 µg/m³ (Source: WHO)

- **No significant impact of odour from MUDA to the human sensitive receptors**

Proposed P2M2

- Eliminate effluent treatment sludge storage by energy recovery at existing solid fuel boiler
- To ensure sufficient oxygen supply to IETS
- Outthrow shall be recycled at new outthrow recycling facility to eliminate outthrow storage

IMPACT EVALUATION, PROPOSED P2M2 AND RESIDUAL IMPACT – NOISE LEVEL

Construction Phase of Upgrading Project

Potential Impact

- Insignificant impact of noise level
- Potential noise sources: Demolition of building, site preparation & construction of buildings

Expected Noise Level at Source and Attenuated Noise Level at Human Sensitive Receptors

Location	Predicted Noise Level (dBA)		
	Demolition of Building and Dismantling of Machinery	Site Preparation	Construction of Structure
Paper mill site	92	90	90
Off-site recycled paper storage area	N.A.	90	90
From Paper Mill Site			
Kg Bukit Angkat	64	64	64
Taman Muhibbah	62	62	62
From Off-Site Recycled Paper Storage Area			
Jade Hill	N.A.	63	63

Note: N.A. = not applicable, Permissible noise level at human sensitive receptors = 65 dBA

- Estimated noise level are within DOE recommended limit

Proposed P2M2

- Construction activities shall be confined within daytime only
- All equipment and machinery shall be lube and maintained for smooth operation
- To install hoarding at construction site as noise barrier

Operational Phase After Plant Upgrade

Potential Impact

- No significant impact is expected for noise level
- Potential noise source: machinery operation
- However, all machinery is installed within enclosed building

Distance from Noise Source (m)	Predicted Noise Level (dBA)
0 (noise source building)	85
100	65
300 (Kg Bukit Angkat)	56
400 (Taman Muhibbah)	53
900 (Taman Sutera)	46
1000	45
1700 (Jade Hills)	41
2000	39

Permissible noise level at human sensitive receptors = 65 dBA

- Noise level at human sensitive receptors is within the noise limit

Proposed P2M2

- All equipment and machinery shall be lube and maintained for smooth operation
- Noise barrier shall be erected to increase noise transmission loss

**IMPACT EVALUATION, PROPOSED P2M2 AND RESIDUAL IMPACT –
WASTE GENERATION AND MANAGEMENT**

Construction Phase of Upgrading Project

- Biomass
 - Expected minimum biomass from land clearing (only bushes and shrubs)
 - Biomass will be collected and left to be composted at vacant area within development site
 - Open burning is prohibited

- Spoil
 - Minimum spoil is expected – the development sites are relatively flat
 - Excess spoil approximately 1,300 m³
 - Spoil shall be used as filling material at other construction site

- Construction and Demolition Waste
 - Approximately 7,670 tonnes construction and demolition waste will be generated
 - 520 tonnes of cladding and steel structure to be sent for recycling
 - Other waste (i.e. concrete) can be used as filling material at other construction site or utilize as cover material at landfill

Operational Phase After Plant Upgrade

- Paper production outthrow
 - Generation : 162 t/d
 - Proposed management : Material recovery at outthrow recycling facility
 - Recyclables, plastic and metals (~92 t/d) to be sold to recycling merchant
 - Fibre (~ 5 t/d) be recycled to production line
 - Residue (~65 t/d) will be disposed at landfill

- Raw water treatment sludge (SW204)
 - Generation : 4 t/d
 - Proposed management : Apply special management of scheduled waste to dispose at approved DOE landfill (as practised by Syarikat Air Selangor Berhad)

- Effluent treatment sludge (SW204)
 - Generation : 50 t/d
 - Proposed management : Energy recovery at existing solid fuel boiler

- Solid fuel boiler (SW104)
 - Generation : 4 t/d/boiler
 - Proposed management : Apply special management of scheduled waste to send as raw material to brick maker

- Other scheduled waste (i.e. SW 305, SW 306, SW 312, SW 409 and SW 410)
 - Generation : ~ 0.05 t/d
 - Proposed management : Send to Pentas Flora or A&C Technology Waste Oil)

IMPACT EVALUATION, PROPOSED P2M2 AND RESIDUAL IMPACT – EROSION & SEDIMENTATION AND LD P2M2

Construction Phase of Upgrading Project

Potential Impact

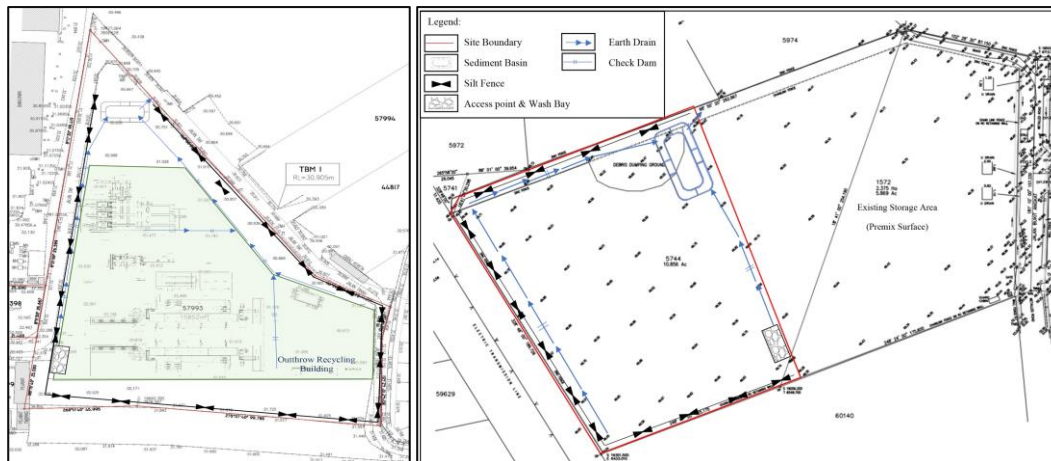
- Potential erosion and sedimentation from land clearing and earthwork

Estimated Soil Loss

Condition	Soil Loss (t/ha/yr)	
	New Outthrow Recycling Facility Site	Expansion Site for Off-Site Recycled Paper Storage
Existing	3.35	15.0
Development (without mitigation)	111.64	37.6

Proposed P2M2

- Implementation of BMPs (i.e. wash through, silt fence, sediment basin and check dam)



Proposed BMPs Layout for New Outthrow Recycling Facility Site (left) and Expansion Site for Recycled Paper Storage (right)

Residual Impact

Estimated Soil Loss After Development with Mitigation

New Outthrow Recycling Facility Site	Expansion Site for Off-Site Recycled Paper Storage
2.79 t/ha/yr	0.94 t/ha/yr

No significant impact on soil erosion and sedimentation

IMPACT EVALUATION, PROPOSED P2M2 AND RESIDUAL IMPACT – HYDROLOGY

Operational Phase After Plant Upgrade

Potential Impact

- Reduction of Sungai Langat capacity from extraction 16,300 m³ raw water/day (0.185 m³/s)
- Predicted low flow at MUDA extraction point : 4.93 m³/day
- Sungai Langat has enough water supply for MUDA extraction

Estimated Low Flow at Hydrological Sampling Point

Sub-Catchment Point	Estimated Q _{7,10} (m ³ /s)
MUDA Extraction Point	4.93
H7 (near Bukit Tampoi Water Treatment Plant)	10.30

- Downstream users include industries, off-site river storage and water treatment plant
- Total existing water extraction at downstream : 6.27 m³/s
- Estimated low flow : 10.3 m³/s
- Sungai Langat volume still sufficient to supply raw water
- Besides, confluence stream i.e. Sungai Labu contribute additional 3.85 m³/s river flow

Proposed P2M2

- River water extraction shall be capped within extraction limit approved by LUAS, 17,000 m³/day

IMPACT EVALUATION, PROPOSED P2M2 AND RESIDUAL IMPACT – SURFACE WATER QUALITY

Operational Phase After Plant Upgrade

Potential Impact

- Potential surface water pollution due to effluent discharge from IETS
- Quantity effluent discharge : 13,052 m³/day

Pollutant Loading in the Treated Effluent and Sg. Langat at Water Quality Sampling Point W7

No.	Parameters	Treated Effluent*		Sg. Langat (sampling point W7)		Loading contribution (%)
		Concentration (mg/L)	Loading (kg/s)	Concentration (mg/L)	Loading (kg/s)	
1	BOD	6	0.0009	8	0.28	0.34
2	COD	29	0.0044	22	0.77	0.57
3	TSS	5	0.0008	60	2.10	0.04

* average value from OER October 2021

- No significant impact from treated effluent discharge to Sungai Langat Quality

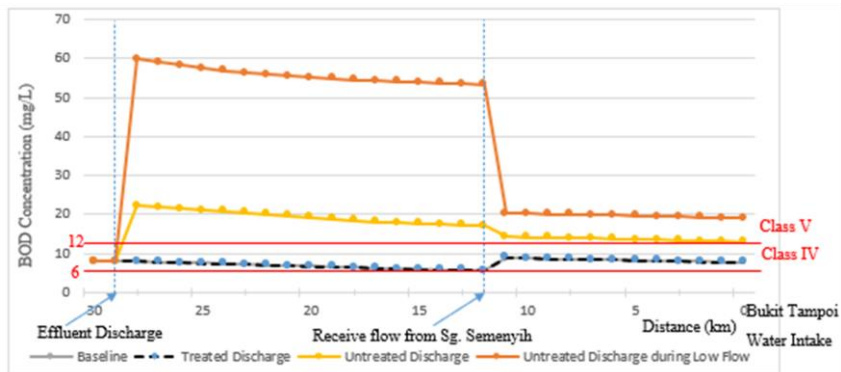
Proposed P2M2

- Ensure treated effluent discharge complies to Environmental Quality (Industrial Effluent) Regulations 2009
- Proposed to install UMAR system to increase COD removal efficiency in IETS
- Plant shall stop paper production immediately during failure of IETS

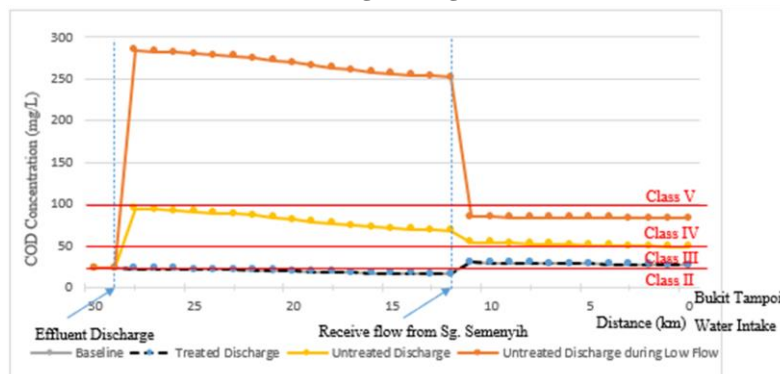
IMPACT EVALUATION, PROPOSED P2M2 AND RESIDUAL IMPACT – SURFACE WATER QUALITY

Residual Impact

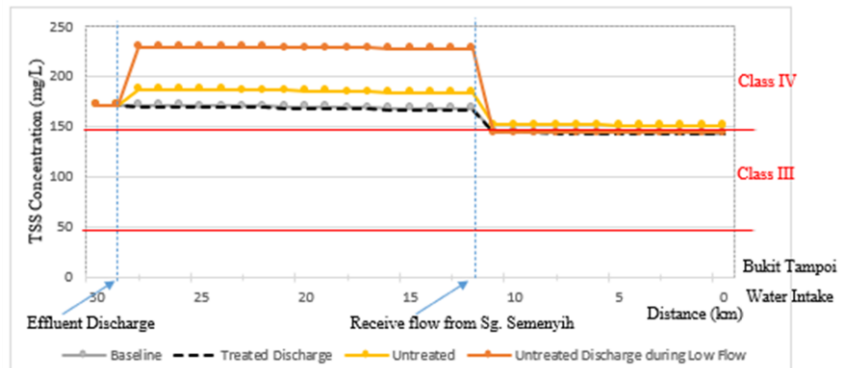
- Discharge of treated effluent into Sg. Langat has no insignificant difference to the water quality (BOD, COD and TSS) of Sg. Langat
- During failure of IETS, BOD, COD and TSS concentration will increase. However, pollutants level reduces at distance 12 km when confluence with Sg. Semenyih
- During failure of IETS and low flow condition, the pollutants level finding is similar to previous scenario



Comparison of Baseline and Predicted BOD Concentration at Downstream if MUDA Paper Mill in Sungai Langat



Comparison of Baseline and Predicted COD Concentration at Downstream of MUDA Paper Mill in Sungai Langat



Comparison of Baseline and Predicted TSS Concentration at Downstream of MUDA Paper Mill in Sungai Langat

IMPACT EVALUATION, PROPOSED P2M2 AND RESIDUAL IMPACT – AQUATIC

Operational Phase After Plant Upgrade

Potential Impact

- Potential impact on aquatic is due to discharge of effluent from IETS
- Surface water quality study shows no significant impact on surface water quality
- No activity and aquaculture premises registered with Hulu Langat District Fisheries Office
- The study area only consists of low diversity with less native species and high in invasive fish species population
- No significant impact on aquatic from MUDA Paper Mill operation

Proposed P2M2

- To carry out fish cultivation at the final discharge point of the IETS as an indicator for the quality of the treated effluent. Continuously monitoring program on the fatality of the fishes at this bio-indicator pond are strongly recommended for the Proposed Project throughout the operational stage.
- To participate in community social responsibility (CSR) activities for river restoration and conservation.
- To minimize harmful effluent and pollutant discharge during operation by research and development (new technologies)

IMPACT EVALUATION, PROPOSED P2M2 AND RESIDUAL IMPACT – LAND TRAFFIC

Construction Phase of Upgrading Project

Potential Impact

- Potential impact on land traffic from movement of construction vehicles
- Only 10 construction vehicles will be utilised for construction materials transportation
- The peak hour traffic for Jalan Bukit Angkat and Jalan Ba/3 is 7-8 am and 5-6 pm. Construction activities will be conducted between 8 am – 5 pm. Thus, **no significant impact on traffic** from the construction phase
- The level of service for all roadways and intersection are maintained as existing condition

Operational Phase After Plant Upgrade

Potential Impact

- Potential impact on land traffic due to increasing raw material and product transportation
- Summary of generated traffic as follows:
 - Product transportation (from paper mill to port) : 18 trucks/hr
 - Recycled paper (from source to off-site storage) : 11 trucks/hr
 - Recycled paper (from off-site storage to paper mill) : 11 trucks/hr
 - Transportation for new staff : 2 buses + 20 motorcycles
- The predicted level of service for roadways and intersections are the same with or without proposed project
- Thus, operation of MUDA Paper Mills does not have significant impact on the traffic

IMPACT EVALUATION, PROPOSED P2M2 AND RESIDUAL IMPACT – LAND TRAFFIC

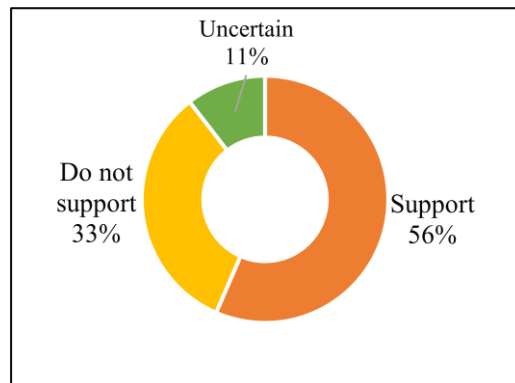
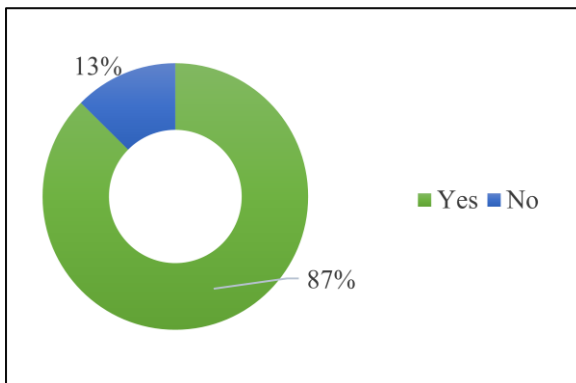
Operational Phase After Plant Upgrade

Proposed P2M2

- Open a new additional north entrance
- The traffic shall be regulated between the additional north entrance and existing south entrance to reduce traffic volume and avoid delay at Jalan Bukit Angkat
- Transportation of recycled paper and final product should avoid traffic peak hour
- Traffic safety measures must be exercised by the relevant parties to ensure the movements of operation-related trucks will not pose danger to the road users
- Should not exceed permissible tonnage materials

IMPACT EVALUATION, PROPOSED P2M2 AND RESIDUAL IMPACT – SOCIO ECONOMIC

- Study objectives
 - To study perception and attitudes of residents on proposed project
 - To identify potential benefits and impacts from proposed project
- Socio survey and focused group discussion (FGD) was conducted



Awareness on Existing MUDA Paper Mill (Left) and Support Toward Proposed Project (Right)

- FGD findings
 - Main concerns from public are odour and road safety
 - According to Ms Chang (staying at Jalan Jade Hills 11/2), odour often occurs in the morning around 8.30 am to 10.30 am
 - Other stated that smelly odour is more obvious when driving at nearby highway
 - Most have associated the odour with the mill, even though many have not been able to pin point the source of the problem

**IMPACT EVALUATION, PROPOSED P2M2 AND RESIDUAL IMPACT –
SOCIO ECONOMIC****Construction Phase of Upgrading Project****Potential Positive Impacts**

- Inflow direct investment
- Creation of job opportunities
- Rise in household income

Perceived Negative Impacts

- Air, noise and water pollution
- Traffic nuisance and road safety
- Influx of foreign workers

Proposed Mitigation Measures

- To ensure pollution prevention and mitigation measures for air quality, noise level, surface water quality and land traffic to be implemented
- Compliance to the limits and regulations

Operational Phase After Plant Upgrade**Potential Positive Impacts**

- Inflow direct investment
- Creation of job opportunities
- Rise in household income

Perceived Negative Impacts

- Social nuisance caused by pollutions
- Health and safety risk
- Traffic congestion and safety of road users
- Influx of foreign workers

Proposed Mitigation Measure

- To ensure pollution prevention and mitigation measures for air quality, noise level, surface water quality and land traffic to be implemented
- Compliance to the limits and regulations

Residual Impact

- Proposed development has the potential to create good residual impacts as it would improve the local standards of living with the new job opportunities and economic growth initiated

IMPACT EVALUATION, PROPOSED P2M2 AND RESIDUAL IMPACT – PUBLIC HEALTH

Construction Phase of Upgrading Project

Potential Impacts

- Impact evaluation on air quality and noise level show insignificant impact on public health

Operational Phase After Plant Upgrading

Potential Impacts

- Impact evaluation on air quality, odour, noise level and surface water quality show insignificant impact on public health
- No extra risk of health that may be derived from the proposed project

Proposed Mitigation Measure

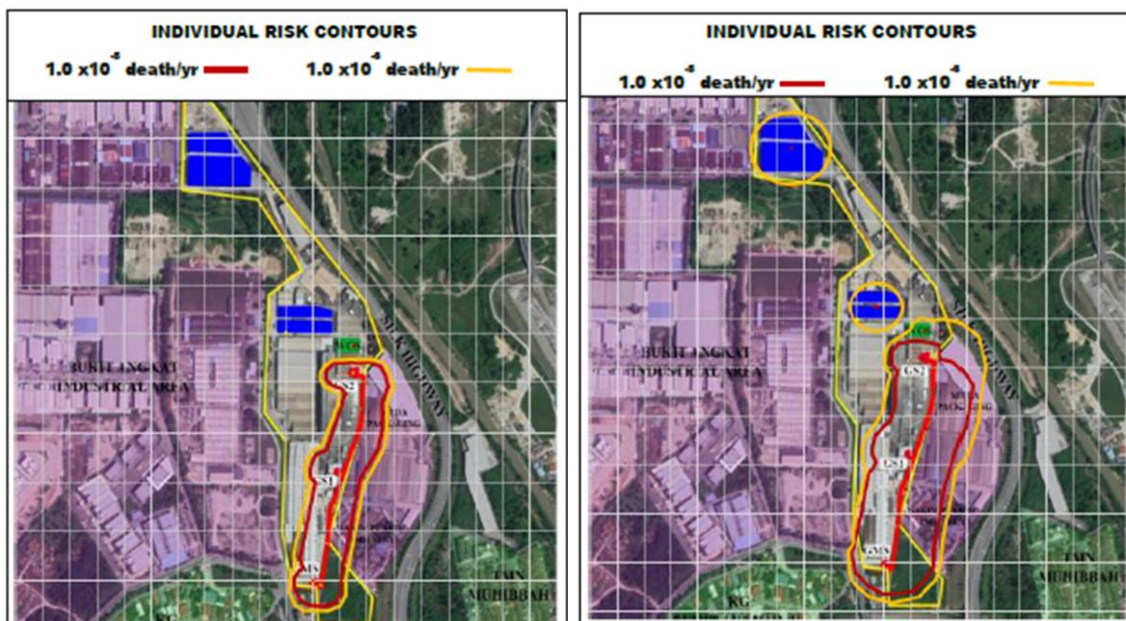
- Proposed pollution prevention and mitigation measures for air quality, odour, noise level and surface water quality are similar to respective study

IMPACT EVALUATION, PROPOSED P2M2 AND RESIDUAL IMPACT – RISK

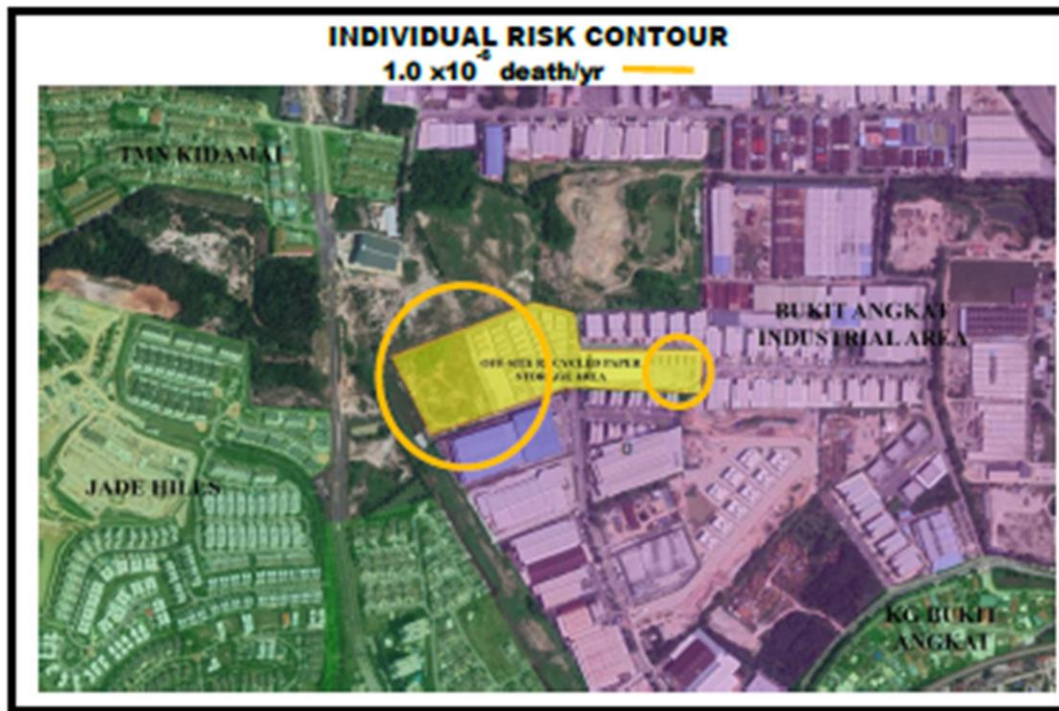
Operational Phase After Plant Upgrading

Potential Impacts

- Potential risk
 - Hazard associated with natural gas fuel and solid fuel
- Potential hazard incident
 - Flash fire
 - Jet fire
 - Explosion



Individual Risk Contour for Credible Loss (Left) and Worst-Case (Right) Scenario at Paper Mill Site

IMPACT EVALUATION, PROPOSED P2M2 AND RESIDUAL IMPACT – RISK

Individual Risk Contour for Off-Site Recycled Paper Storage

- Individual risk contour of 1.0×10^{-5} death/yr contour is within the industrial zone
- Individual risk contour of 1.0×10^{-6} death/yr contour does not reach any residential, hospital and other public vicinities
- The impact from risk to the surrounding human sensitive receptor is **not significant**

Proposed Mitigation Measure

- It is suggested that all personnel to undergo proper fire safety training with Jabatan Bomba dan Penyelamat Malaysia
- All emergency planning for fire and other incidents needs to be compliance with Jabatan Bomba dan Penyelamat Malaysia.
- Regular inspection and maintenance should be exercised.

PROPOSED PERFORMANCE MONITORING

Construction Phase of Upgrading Project

Proposed Performance Monitoring for BMPs

	Control Measure	Monitoring Frequency	Proposed Action
1.	Silt Trap and Best Management Practices	Daily and after rain event (>12.5 mm)	<ul style="list-style-type: none"> Monitoring and regular inspection to be carried out after event of heavy downpour. In-situ measurement for turbidity at the final discharge point within 30 minutes after raining.
2.	Wash Trough	Daily	Daily monitoring and regular inspection/maintenance to be carried out.

Operational Phase After Plant Upgrade

Proposed Performance Monitoring for IETS

Process Unit / Location	Parameter	Frequency	Sampling Location
PRIMARY UNIT			
Equalization Tank	Influent flowrate, pH, TSS and COD	Daily	Influent of equalization tank
Static Screen	Flowrate, TSS and COD	Daily	Static Screen outlet
SECONDARY UNIT			
Coagulation and flocculation tank	Flowrate, pH	Daily	Coagulation tank
Dissolved Air Flootation (DAF)	Air pressure, TSS _{in} , COD _{in}	Daily	DAF inlet
	TSS _{out} , COD _{out}	Daily	DAF outlet
Trickling Filter	pH, TSS, COD	Daily	Trickling filter outlet
Aeration Tank	Flowrate, DO, MLSS, MLVSS, SV ₃₀ , SVI, F/M ratio	Daily	Aeration tank
Clarifier	Flowrate, pH, TSS, COD	Daily	Clarifier outlet

Performance Monitoring for Solid Fuel Boiler

Process Unit / Location	Parameter	Frequency	Sampling Location
FURNACE			
Furnace	Pressure	Daily	Furnace
	Temperature	Daily	
BAG FILTER			
Bag Filter	Pressure Drop	Daily	Bag Filter
	Temperature	Daily	

PROPOSED COMPLIANCE MONITORING
Operational Phase After Plant Upgrade
Proposed Compliance Monitoring

Environmental Component	Monitoring Parameter	Monitoring Location	Monitoring Frequency	Compliance Requirement
Discharge Effluent	31 parameters per stipulated in the Environmental Quality (Industrial Effluent) Regulation, 2009 , Standard A	Treated effluent final discharge	Weekly (monthly submission of monitoring report to DOE via online environmental system (OER))	Environmental Quality (Industrial Effluent) Regulation, 2009 , Standard A
Air Emission	PM, NO ₂ and CO	CHP stack	Yearly	Environmental Quality (Clean Air) Regulations 2014,
Air Emission	PM, SO ₂ , NO ₂ and CO	Solid fuel boiler stack	Continuous (CEMS)	Environmental Quality (Clean Air) Regulations 2014,
Noise Level	<ul style="list-style-type: none"> • L_{Aeq} • L_{Amin} • L_{Amax} 	Plant boundary	Yearly	Second schedule of Guideline of Noise Control and Limits 2019

PROPOSED IMPACT MONITORING
Construction Phase of Upgrading Project

Environmental Component	Monitoring Parameter	Monitoring Location	Monitoring Frequency	Compliance Requirement
Noise Level	<ul style="list-style-type: none"> • L_{Aeq} • L_{Amin} • L_{Amax} 	NL 1 Kg. Bukit Angkat	Quarterly	Second schedule of Guideline of Noise Control and Limits 2019
		NL 2 Tmn Sutera		
		NL 3 Jade Hill		

PROPOSED IMPACT MONITORING
Operational Phase After Plant Upgrade

Environmental Component	Monitoring Parameter	Monitoring Location	Monitoring Frequency	Compliance Requirement
Air quality	<ul style="list-style-type: none"> • TSP • PM₁₀ • PM_{2.5} • SO₂ • NO₂ • CO 	AQ 1 Jade Hills	Yearly	Ambient Air Quality Standard 1989 (for TSP only) Ambient Air Quality Standard 2020
		AQ 2 Kg. Bkt. Angkt		
		AQ 3 Tmn Suetra		
Odour	<ul style="list-style-type: none"> • Odour characteristic • Odour intensity • Odour offensiveness 	OD 1 Kg. Bkt Angkat	Quarterly (conducted by internal trained personnel)	Not applicable
		OD 2 Jade Hills		
		OD 3 Tmn Sutera		
		OD 4 Residensi Setia Impian		
Noise Level	<ul style="list-style-type: none"> • L_{Aeq} • L_{Amin} • L_{Amax} 	NL 1 Kg. Bukit Angkat	Yearly	Guideline of Noise Control and Limits 2019
		NL 2 Tmn Sutera		
		NL 3 Jade Hill		
Surface Water Quality	Parameters in the National Water Quality Standard for Malaysia	WQ 1 Sg langat approximately 1.3 km upstream from project site	Yearly	National Water Quality Standard for Malaysia
		WQ 2 Sg langat approximately 1.6 km downstream from project site		
		WQ 3 Sg langat approximately 5.0 km downstream from project site		