

EXECUTIVE SUMMARY

EUROPASIA ENGINEERING SERVICES SDN BHD

ENVIRONMENTAL IMPACT ASSESSMENT (EIA) FOR THE PROPOSED EXPANSION OF EXISTING SANITARY LANDFILL, CONSTRUCTION OF A SOLID WASTE TREATMENT AND DISPOSAL FACILITY (THERMAL TREATMENT PLANT (WTE3), AND ISWMC COMPONENTS) AT TANJUNG DUA BELAS INTEGRATED SOLID WASTE MANAGEMENT CENTRE (ISWMC), MUKIM TANJUNG DUA BELAS, DAERAH KUALA LANGAT, SELANGOR DARUL EHSAN.

PROJECT PROPONENT:



WORLDWIDE HOLDINGS BERHAD.

Mercu Worldwide, No.7, Persiaran Sukan, Laman Seri Business Park, Seksyen 13, 40100 Shah Alam, Selangor Darul Ehsan
Attn.: Datin Paduka Norazlina Zakaria

ENVIRONMENTAL CONSULTANT:



Engineering Services Sdn. Bhd.

EUROPASIA ENGINEERING SERVICES SDN. BHD.

No. 63A-2 & 65-2, Petaling Utama Avenue, Jalan PJS1/50, Taman Petaling Utama, 46150 Petaling Jaya, Selangor Darul Ehsan
Attn. : Pn Nur Arina Muhamad Affandi (CEP-C0101) (EIA Study Team Leader)



JURISDICTION

- Majlis Perbandaran Kuala Langat (MPKL)



PROJECT AREA

- 100 acres (40.4686 hectares)



LEGAL STATUS

First Schedule

Item 14: Waste Treatment and Disposal

(b) Solid Waste:

- Construction of Composting Plant.
- Construction of Recovery Plant or Recycling Plant.

-There are proposed **one (1) unit of composting plant (CP), one (1) unit of anaerobic digester (AD), one (1) unit of material recovery facility (MRF) and one (1) unit of construction and demolition waste MRF (C&D MRF)** at Tanjung Dua Belas ISWMC

Second Schedule

Item 14: Waste Treatment and Disposal

(b) Solid Waste:

- Construction of thermal treatment plant.
- Construction of sanitary landfill facility.

- The proposed project is a **New sanitary landfill Phase 2 (TG12SL2) one (1) unit of new thermal treatment plant No.3 (WTE3)** at Tanjung Dua Belas ISWMC



PROJECT SCOPE

WTE3

- 19.2 acres (7.77 hectares)
- Moving Grate Incinerator
- Operating Capacity: 1800 tons per day
- Generating energy capacity: 45MWatt/day
- Operating Hours: 8,000 hours per year

TG12SL2 and ISWMC

Component of ISWMC	Land Area
Landfill expansion (TG12SL2)	70.0 acres
WTE3	19.2 acres
Material Recovery Facility (MRF)	1.1 acres
Construction & Demolition MRF	1.5 acres
Anaerobic Digester	0.9 acres
Composting Plant	1.2 acres
New Leachate Treatment Plant Expansion	6.1 acres
Total	100.0 acres

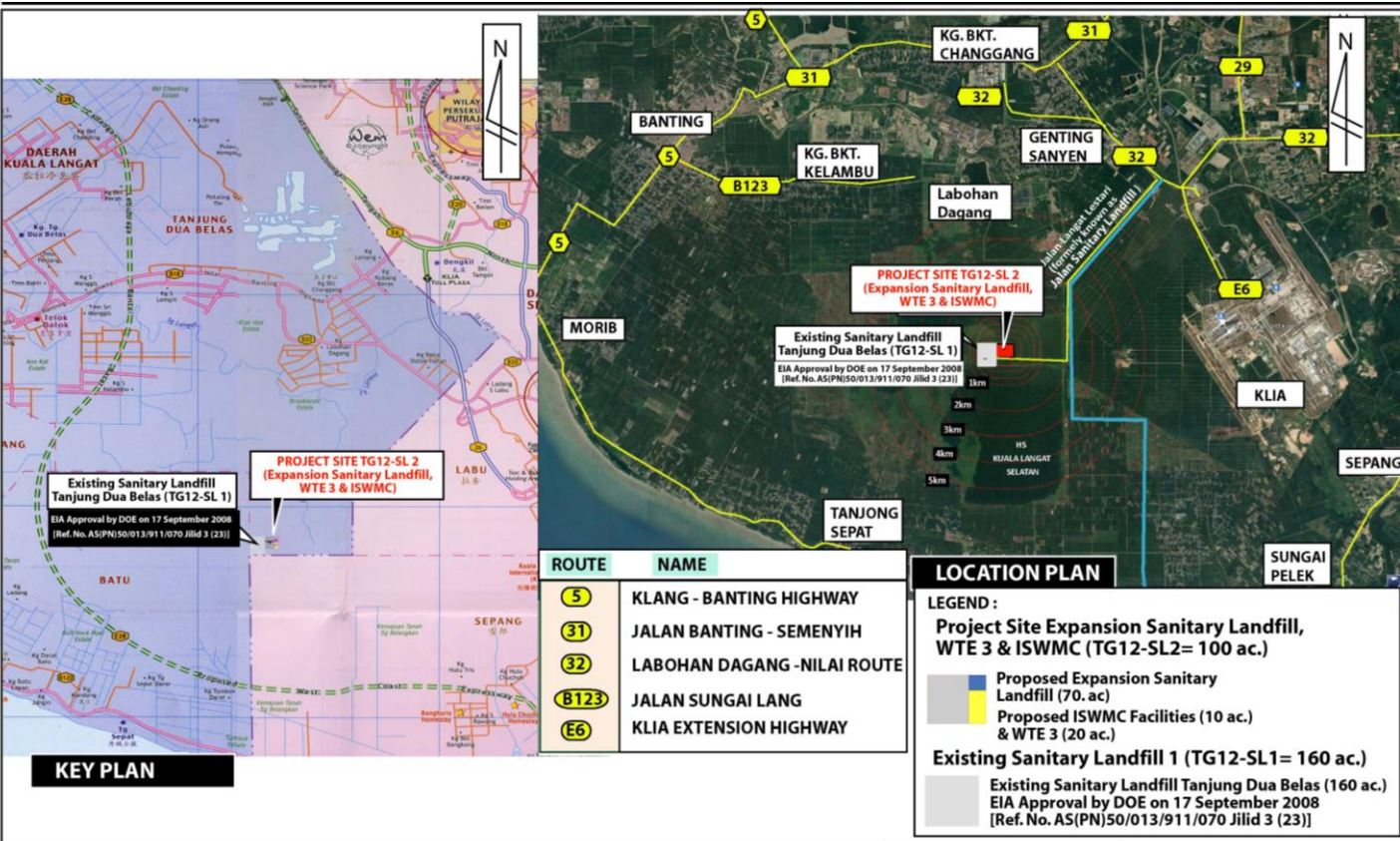
Note: Land area sizes are approximate in conceptual design, and included the required circulation areas, land setback and green areas.]



ZONING COMPATIBILITY

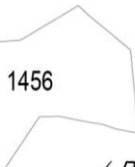
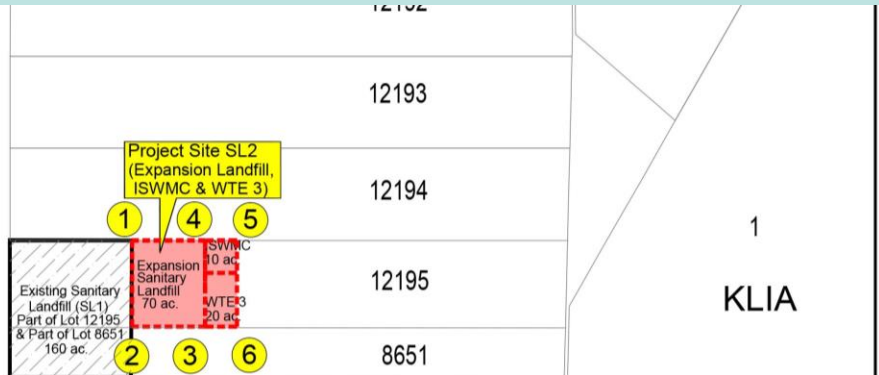
- Based on **Rancangan Tempatan Kuala Langat 2030 (Pengubahan 2)**, it shows that the Project site is located within Blok Perancangan (BP) 1: Tanjung Dua Belas and Blok Perancangan Kecil (BPK) 1.11-Bandar Seri Ehsan and zoning falls **under under infrastructure and utility which its land use category allows for solid waste disposal.**

KEY AND LOCATION PLAN



LOT DEMARCATION

NO	LATITUDE	LONGITUDE
1	2° 44'7.190"N	100°36'29.24"E
2	2° 43'48.39"N	101°36'29.28"E
3	2° 43'48.45"N	101°35'45.14"E
4	2° 44'7.245"N	101°35'45.09"E
5	2° 44'7.237"N	101°36'51.95"E
6	2° 43'48.46"N	101°36'52.00"E



(REZAB HUTAN KUALA LANGAT SELATAN)
HSK

LEGEND:
PROPOSED EXPANSION SANITARY LANDFILL
WTE 3 & ISWMC (TG12-SL 2 = 100 ac.) Part of Lot 12195

- EXPANSION SANITARY LANDFILL (70 ac.)
- ISWMC (10 ac.)
WTE 3 (20 ac.)

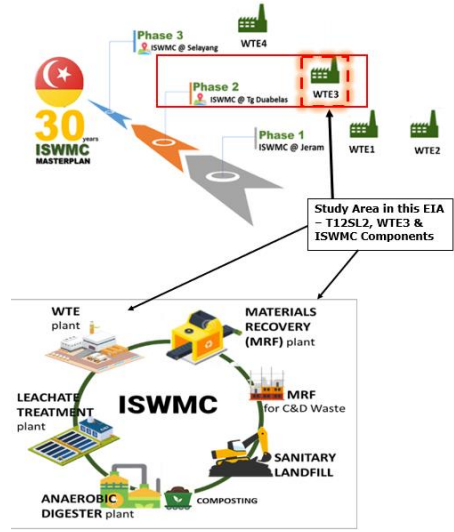
 Existing Sanitary Landfill (TG12-SL1 = 160 ac.)
Approved EIA Study by DOE
Ref No.: AS(PN) 50/013/911/070 Jilid 3(23)
dated : on 17 September 2008





PROJECT SCHEDULE

30-YEAR ISWMC MASTERPLAN IN SELANGOR



Pre-Development Stage	Timeline
Land Acquisition	April 2021 to December 2022 (21 months)
EIA / SIA Award	April 2023 to March 2024 (12 months)
Landfill detailed design	January 2023 to December 2023 (12 months)
Project approval from Local Authorities	September 2023 To June 2024 (9 months)
Project approval from DOE & PLAN Malaysia	September 2023 To June 2024 (9 months)
Construction Stage (TG12SL2)	January 2024 to December 2024 (12 months)
Construction Stage (WTE3)	Quarter 1 2023 to March 2027 (39 months)
Landfill Operation (TG12SL2)	April 2024 to 2054 (30 years)
WTE3 Operation (WTE3)	January 2024 to 2054 (30 years)
Sequential Landfill Closure	2026 to 2054 (28 Years)
Final Closure Works	2026 to 2054 (28 Years)

Source: Worldwide Holdings Bhd, 2022.

Proposed Project Development Schedule For TG12SL2

Activity	Time Schedule (Years)																											
	2021				2022				2023				2024				2025				2026				2026-2054			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4				
EIA and SIA Stage																												
EIA & SIA Award																												
Preparation and submission of Detailed EIA																												
Project approval from DOE & PLAN Malaysia																												
Pre-Development Stage (Extension Area)																												
Land acquisition																												
Landfill detailed design																												
Project approval from Local Authorities																												
Construction Stage																												
Sanitary Landfill Construction																												
Operation Stage																												
Landfill Operation																												
Landfill Closure Stage																												
Sequential landfill closure																												
Final closure works																												

Proposed Project Development Schedule For WTE3

Activity	Time Schedule (Years)																2028-2057											
	2022				2023				2024				2025					2026				2027						
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4			
Detailed EIA/SIA Stage																												
TOR Approval																												
Preparation and submission of Detailed EIA/SIA																												
EIA/SIA Approval from DOE																												
Pre-Development Stage																												
Plant Feasibility Study																												
Land acquisition																												
Owner Engineer Works																												
EPCC Award																												
KM/BP Submission																												
Financial Close																												
Construction Stage																												
WTE Construction																												
Commissioning/IOD																												
ST License Permanent																												
COD																												
Operation Stage																												
Operation & Maintenance																												



STATEMENT OF NEED

STRATEGIC LOCATION & HIGH ACCESSIBILITY

- It is located next to the Tanjung Dua Belas Sanitary Landfill and surrounded by other non-residential areas such as forest, swamp, and oil palm plantations.
- It is also located close to:
 - i. Bandar Seri Ehsan – 3.7 km
 - ii. Aerofront City Development – 2.5km
- No established residential areas nearby.

LANDUSE OPTIMIZATION

- Upgrade the economic state of land.
- Optimize the usage of land, which is presently covered by secondary shrubs
- Congruent with the surrounding area landuse;
- Create more job opportunities.

ENVIRONMENTAL CONSIDERATION

- From an ecological point of view, the current biodiversity of the flora and fauna composition of the site will be slightly affected as the current oil palm plantation and swamp vegetation will have to be sacrificed during the construction state.
- The proposed development includes in its concept the development of greening areas and appropriate buffer zone with its surroundings. This is further improving/reducing the anticipated WTE3 plant and TG12SL2 pollution (i.e., air, noise, water, etc.) generated as the nature green elements will be utilized as part of vegetative buffer.

OTHER SUPPORTING MATTERS

- Increase in state and nation's revenue through issuance of licenses and collection of taxes.
- These include employment and income of the surrounding residents, reducing emissions of greenhouse gases and solid waste disposal facilities and garbage burning.
- Value from municipal solid waste recovery activities will result in various benefits to the economy and the environment.
- The use of solid waste thermal treatment plant (WTE3) is seen as an appropriate approach as it further reduces the amount of solid waste to the landfill and able to extend the lifespan of the TG12SL1 and upcoming TG12SL2.
- More wastes can be recycled through ISWMC facility such as Material Recovery Facility (MRF), Construction & Demolition Material Recovery Facility (C&D MRF) and Composting Plant (CP). Value from municipal solid waste recovery activities will result in various benefits to the economy and the environment.
- To expand the Tanjung Dua Belas Sanitary Landfill and to kick start the WT3 and ISWMC to manage increasing wastes.




CONFORMANCE OF TO THE UNITED NATION SUSTAINABLE DEVELOPMENT GOALS

5 sustainable development goals are matched with the proposed Project (WTE3, TG12SL2 + ISWMC) as below:



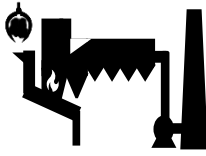


PROJECT OPTIONS

 Agriculture	 WTE3 & ISWMC	 No Development
<p>Does not compliment the Selangor State Government decision to approve the proposed Integrated Solid Waste Management Centre (ISWMC) development in Tanjung Dua Belas.</p>	<p>Solid Waste Thermal Treatment Plant 3 (WTE3) & MRF, C&D MRF, R&D Centre, Composting Plant and Anaerobic Digester Plant can handle solid waste up to 2,400 tonnes/day</p>	<p>No alternative to dispose the increasing waste volume of the total daily 2,400 tonnes / day</p>
<p>Generate revenue to the government in long term basis</p>	<p>Increase in state and nation's revenue through issuance of licenses and collection of taxes</p>	<p>May cause adverse environmental impacts and disaster to the environment if the current lifespan of the landfill could not be extended. Example: 1) Severe flood in Selangor in end of December 2021 have generated tremendous bulky household wastes due to damage from the flooding.</p>
<p>Provide job opportunities</p>	<p>Provide job opportunities for both blue-collars and white-collars</p>	<p>There is an existing landfill at the western region of the Proposed Project Site on 160 acres of land. However, the existing Tanjung Dua Belas (TG12SL1) is estimated to reach its full capacity in 2024 / 2025. The exceedance of waste capacity will cause adverse impacts to the environment. There will be no designated area to recycle, handle and dispose the increasing amount of municipal solid waste (MSW) generated from the Districts of Shah Alam, Kajang, Kuala Langat, Sepang, Ampang Jaya, Putrajaya, Petaling Jaya, and Subang Jaya except for Jeram Sanitary Landfill and Bukit Tagar Sanitary Landfill which are located 80km and 110km away respectively from the districts.</p>
<p>Site is strategically located next to the existing Tanjung Dua Belas Sanitary Landfill and surrounded by other non-residential areas.</p>		

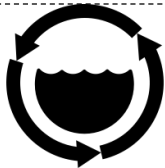


EXPANSION OF FACILITIES AT TG12SL



THERMAL TREATMENT PLANT/ WASTE-TO-ENERGY PLANT NO.3 (WTE3)

WTE3 is proposed for thermal treatment of 1,800 tonne per day MSW received at TG12SL. Hot flue gas generated will be converted into power, anticipating power generation of about 45 MW to the power grid.



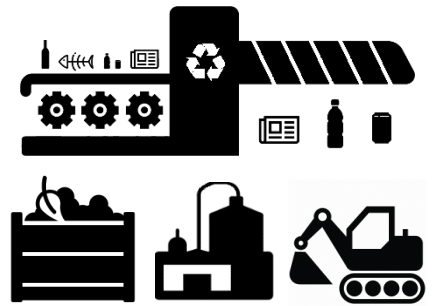
NEW LEACHATE TREATMENT PLANT EXPANSION

Gather leachate generated from TG12SL2 landfill cells, treatment facilities at the ISWMC including WTE3 and other solid waste recycling and recovery facilities, shall be built to treat leachate to an effluent quality meeting the treated leachate effluent standards stipulated in the Environmental Quality (Control of Pollution from Solid Waste Transfer Station and Landfill) Regulations 2009.



TG12 SANITARY LANDFILL PHASE 2 (TG12SL2)

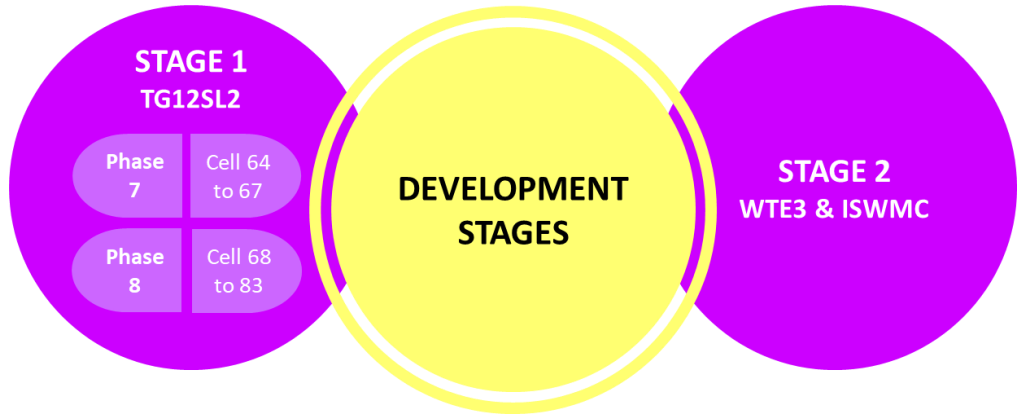
Comprises of Phase 7 and Phase 8. Phase 7 consists of Cell 64 to 67 whereas Phase 8 consists of Cell 68 to 83. The overall footprint area of the waste cells (Cell 64 to Cell 83) is about 63 acres. Meanwhile the remaining area will be for access road and drainage. Phase 7 will commence operation first before WTE3 plant starts operation. Meanwhile, waste placement in Cell 68 to Cell 83 will be after WTE3 plant. Daily capacity of Phase 7 is 2,400 tonnes/day whereas daily capacity of Phase 8 is 400 tonnes/day.



INTEGRATED SOLID WASTE MANAGEMENT CENTRE (ISWMC)

Shall be constructed with waste treatment facilities including:

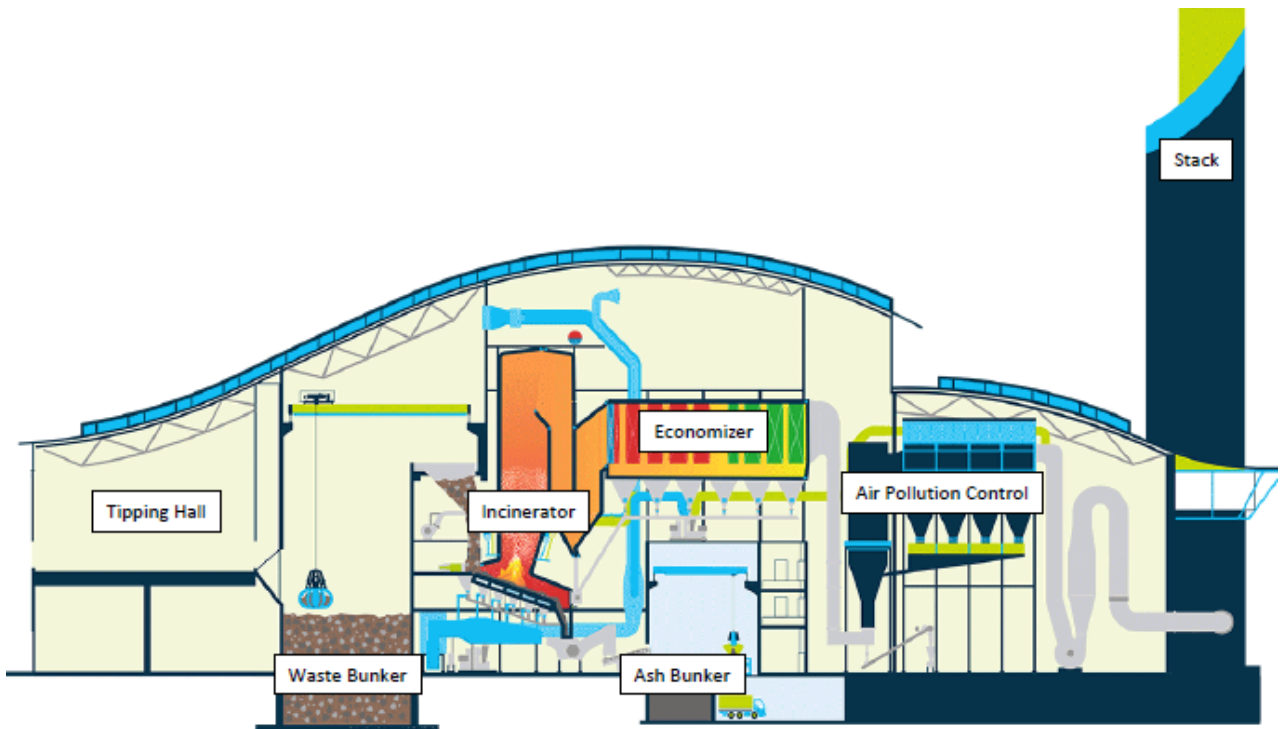
- materials recovery facilities (MRF) plant for municipal solid wastes (a sorting system to recover valuable recyclables),
- anaerobic digestion (AD) plant for organic wastes (a component of municipal solid waste),
- composting plant of garden and landscape waste (a component of solid waste, or green waste), and
- construction & demolition (C&D) wastes recycling plant (which is a component of solid wastes).



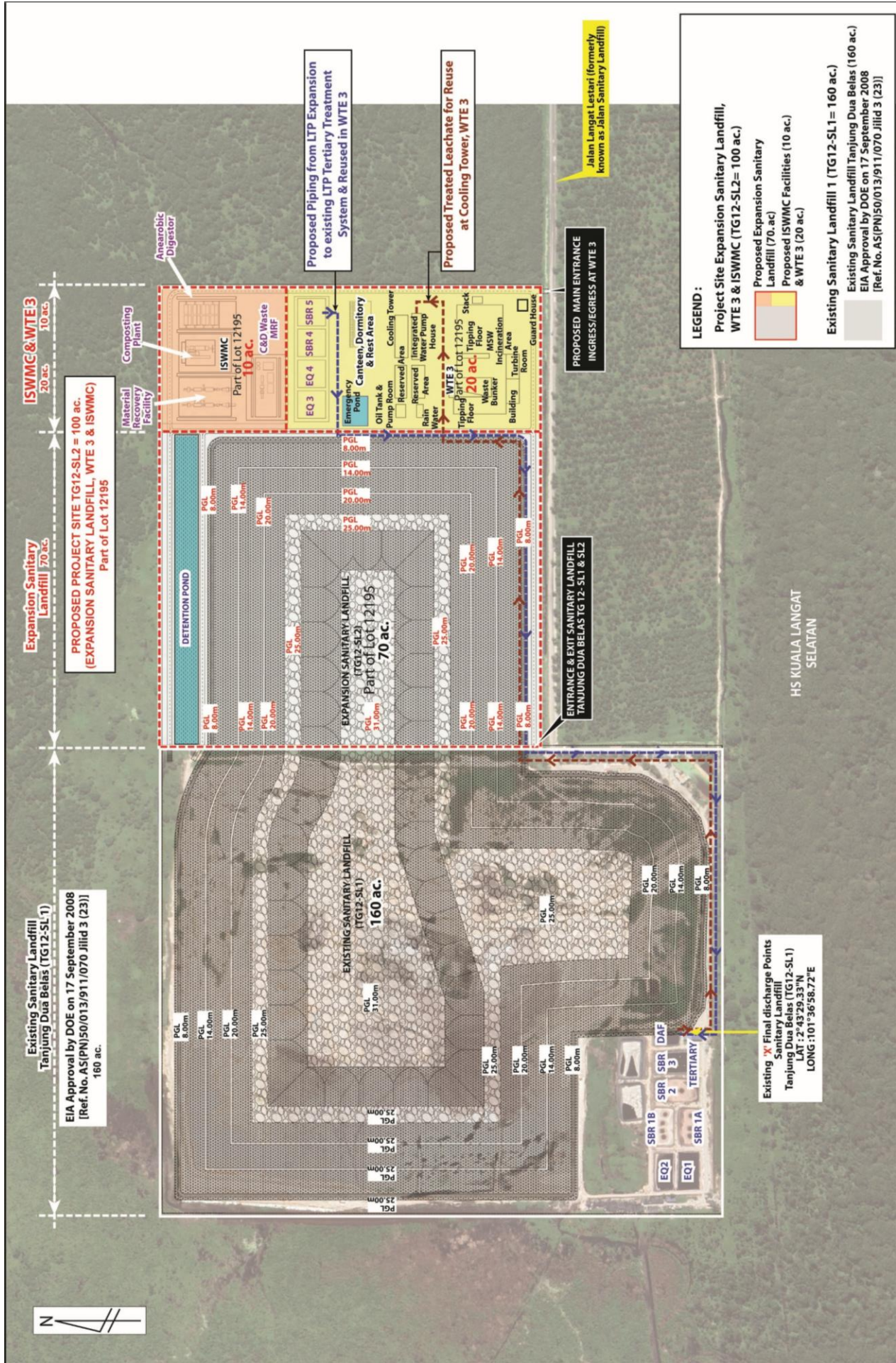
Developed and to be operated by Worldwide Holdings Berhad (WHB).

The EIA for the TG12SL1 development was approved by DOE on 17th September 2008 via letter ref.no: JAS AS(PN)50/013/911/070 Jilid 3 (23)

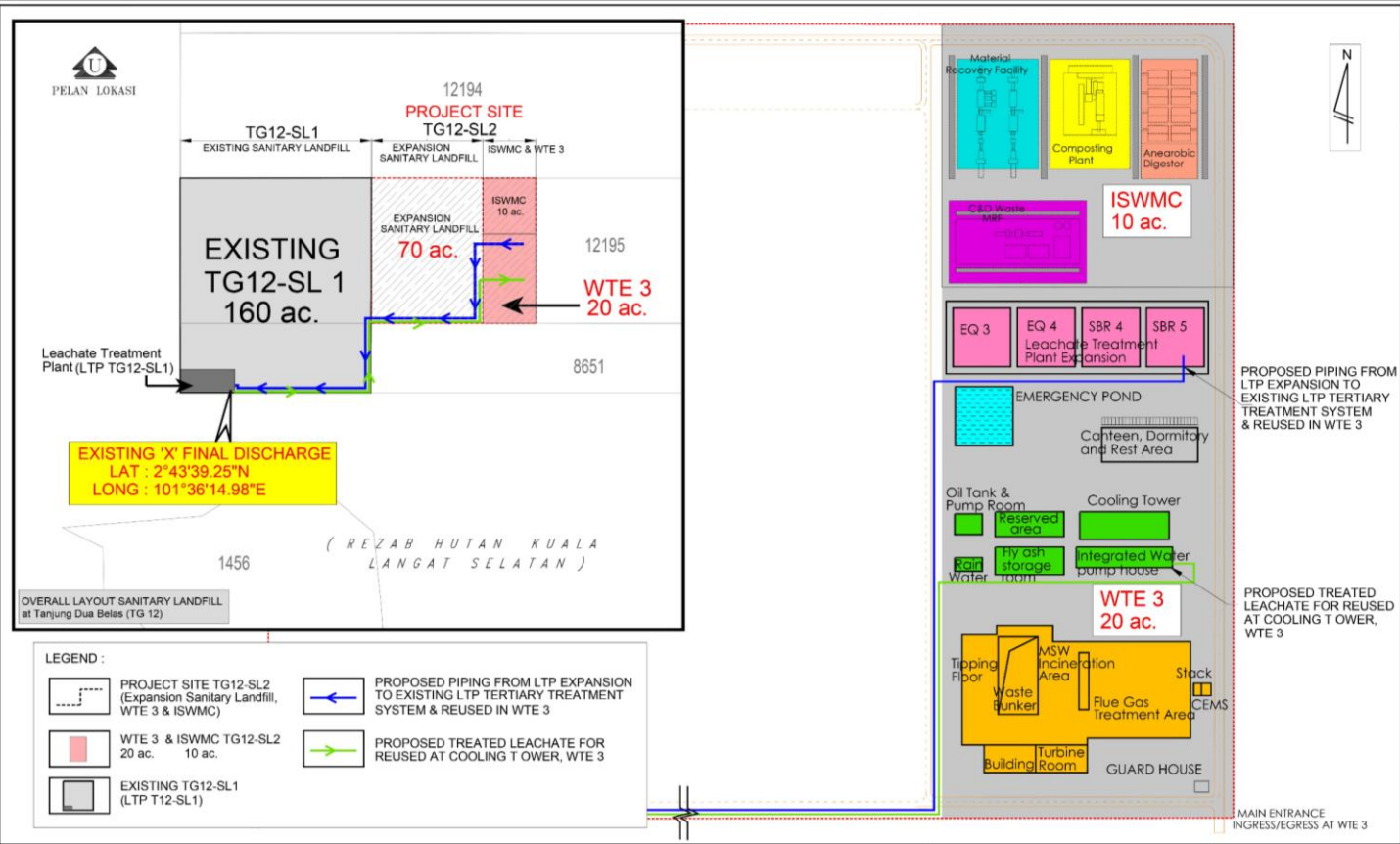
TYPICAL SOLID WASTE THERMAL TREATMENT PLANT (WTE3) SET UP



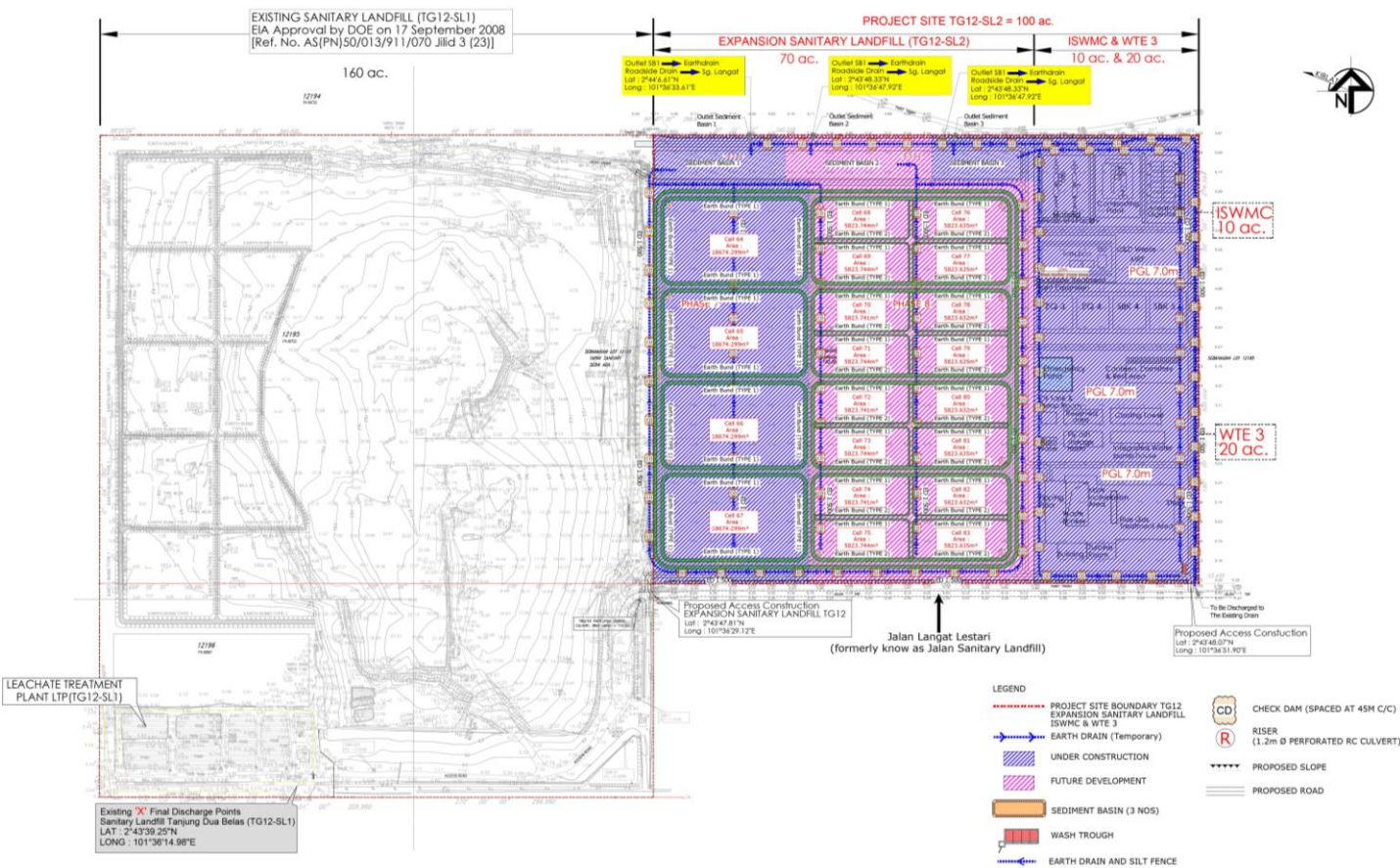
OVERALL MASTER LAYOUT PLAN



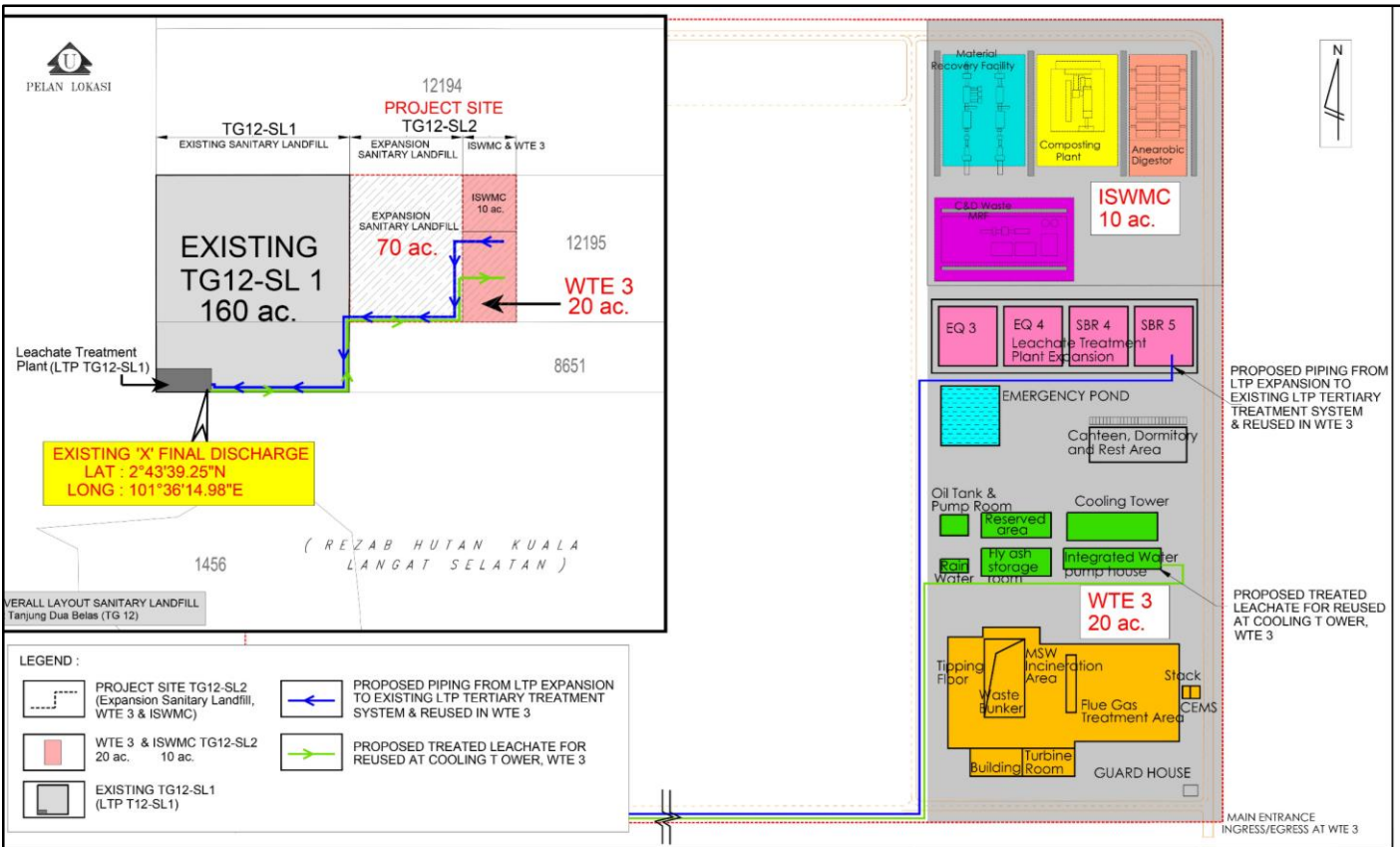
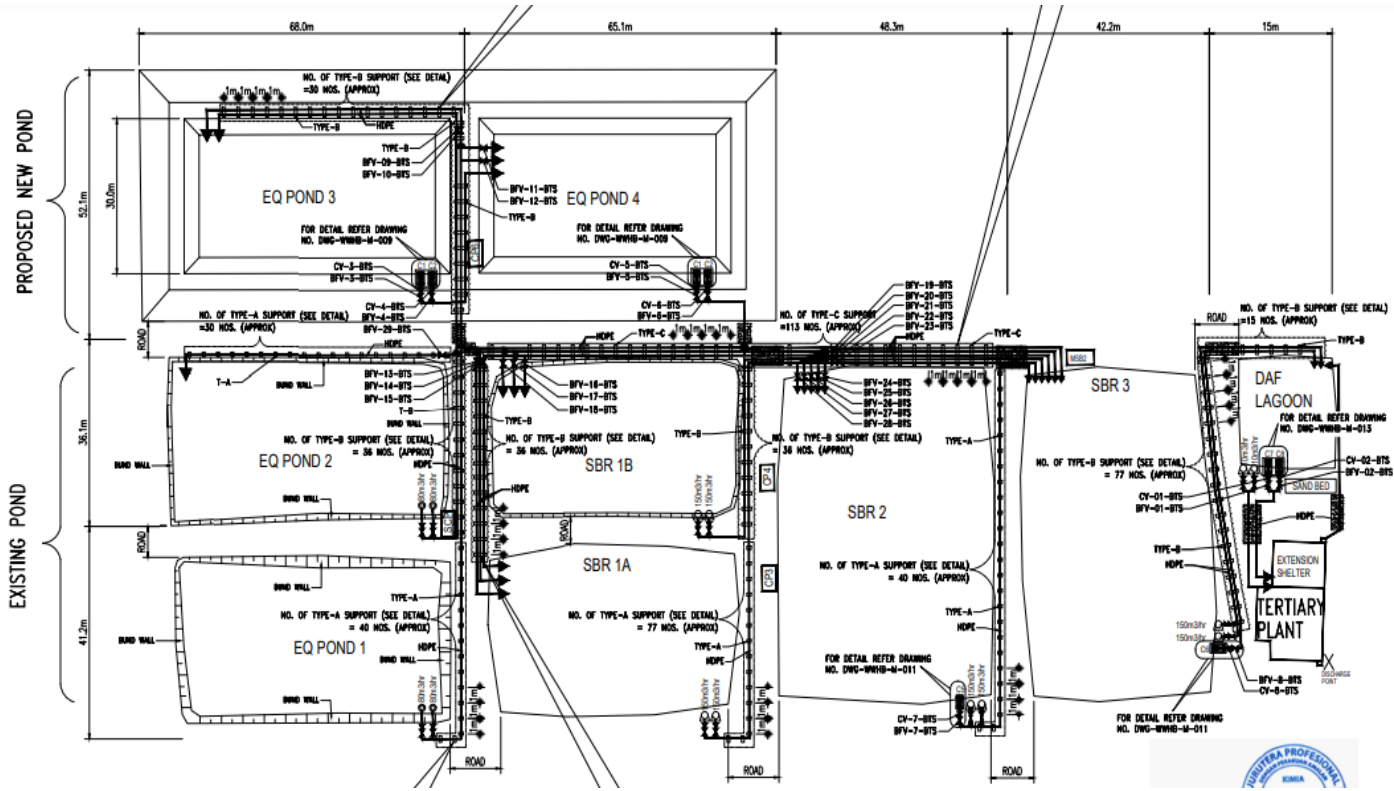
PROPOSE LAYOUT OF WTE3 AND ISWMC



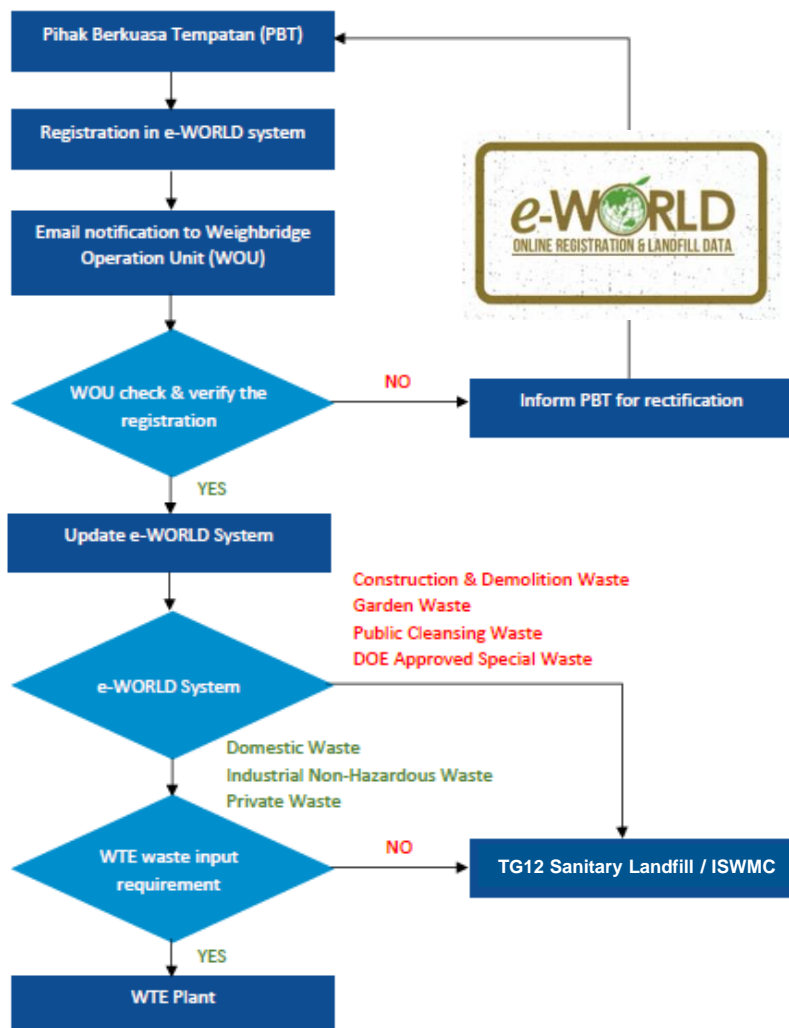
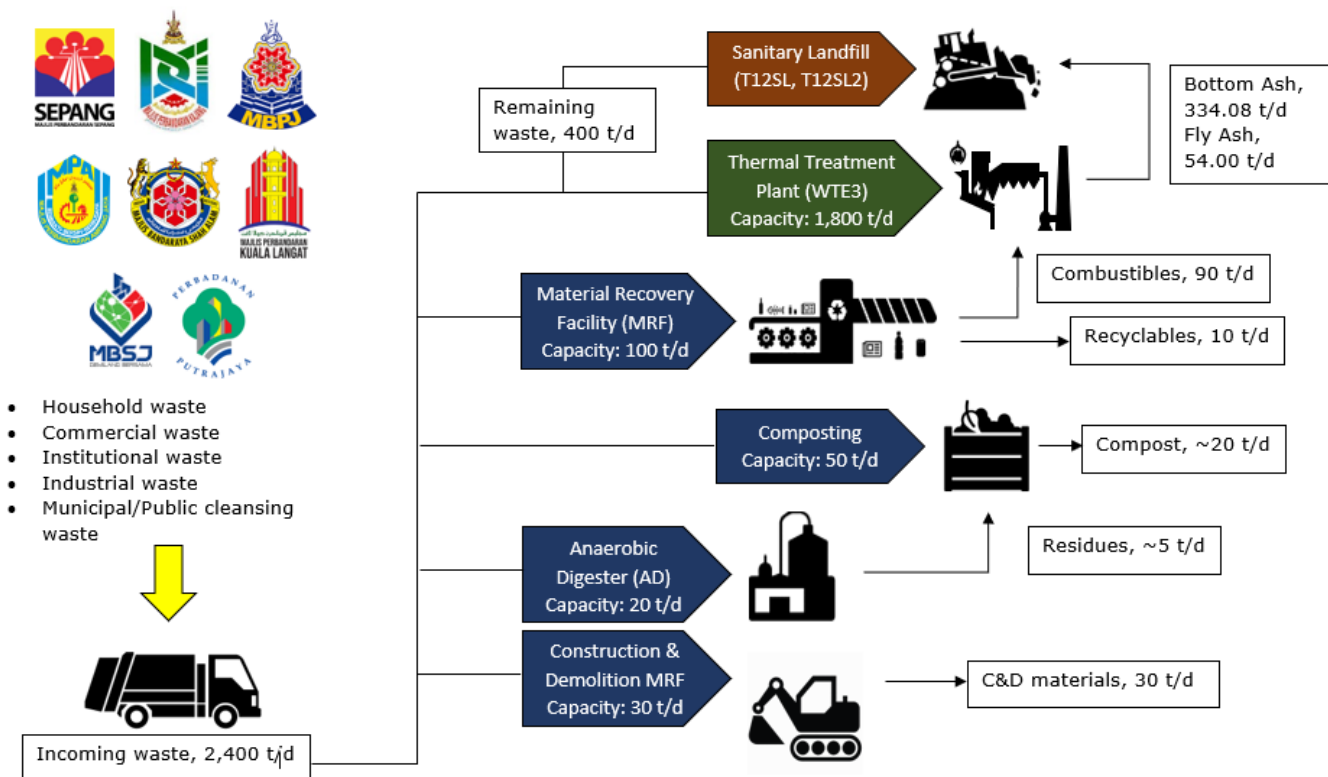
LAYOUT PLAN OF PROPOSED TG12SL2



PROPOSED LTP EXPANSION AT TG12SL2 AND EXISTING LTP AT TG12SL1



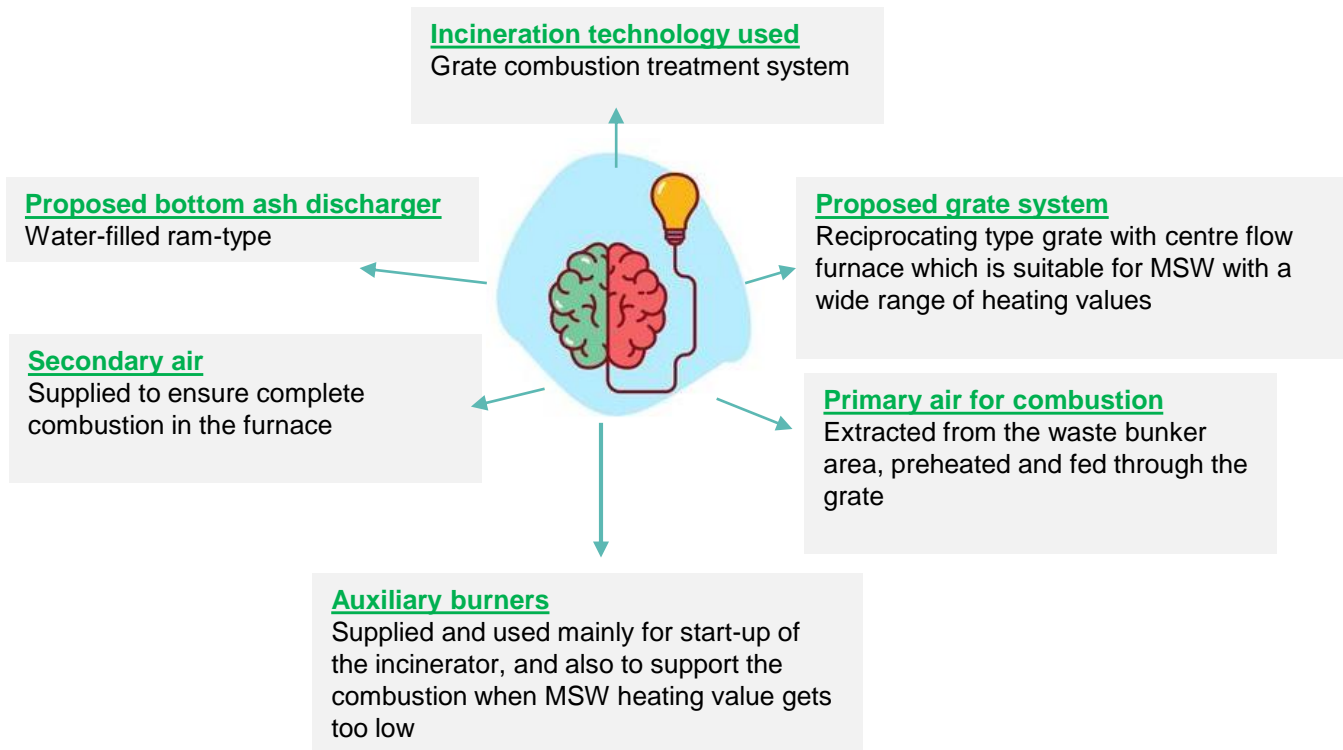
WASTE FLOW IN TANJUNG DUA BELAS WASTE TREATMENT AND DISPOSAL FACILITY



ISWMC WASTE FLOW ON e-WORLD SYSTEM

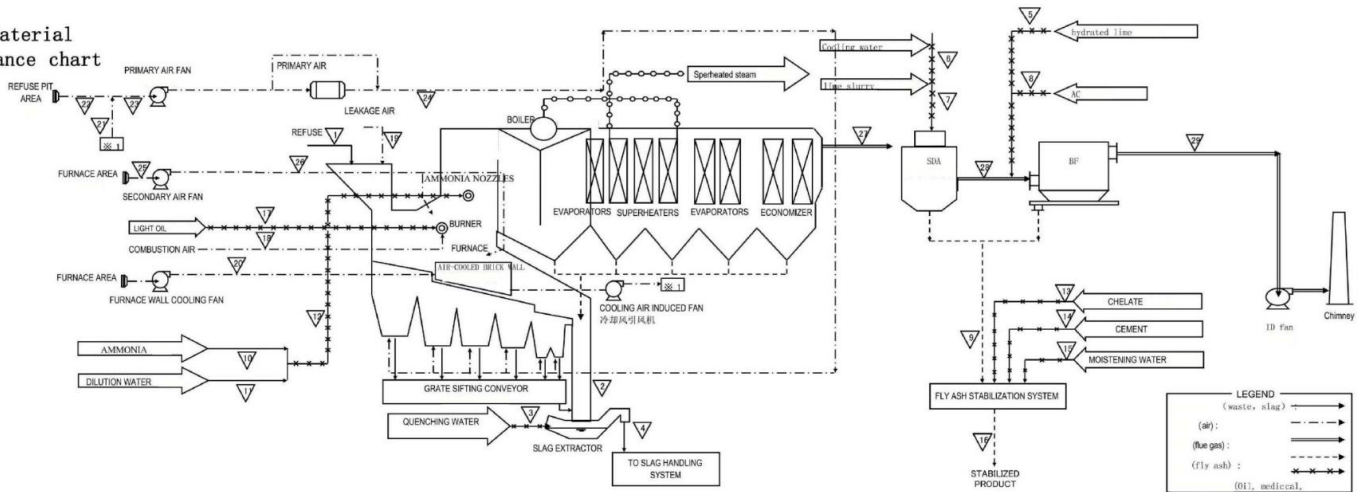
DESIGN BASIS OF WTE3

1800 TONS PER DAY	90 %	45 MW PER DAY	8000 HOURS PER YEAR
SOLID WASTE ACCEPTANCE RATE	SOLID WASTE VOLUME REDUCTION RATE	CAPACITY OF GENERATING ENERGY	RATE OF OPERATION



WTE3 PROCESS FLOW & MASS BALANCE

Material balance chart



	No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19		
	LHV	waste	dry slag	quenching water	wet slag	hydrated lime	cooling water	lime slurry	activated carbon	fly ash	ammonia water	dilution water	diluted ammonia	chelating agent	cement	Humidification water	stabilized fly ash	diesel	Combustion air	Leak air		
	kJ/kg	kg/h	kg/h	kg/h	kg/h	kg/h	kg/h	kg/h	kg/h	kg/h	kg/h	kg/h	kg/h	kg/h	kg/h	kg/h	kg/h	kg/h	m ³ /h	°C	m ³ /h	°C
HLV.max	8,792	32,143	5,965	3,451	8,521	*	721	2890	17	1049	104	559	664	21	105	315	1490	0	0	---	7,458	20
110%MCR	7,536	41,250	7,655	4,429	10,935	*	851	3409	20	1238	123	660	783	24.8	123.8	371.3	1,757.3	0	0	---	9,571	20
100%MCR	7,536	37,500	6,959	4,026	9,941	*	773	3099	18	1125	112.0	600	712	22.5	112.5	337.5	1,597.5	0	0	---	8,701	20
70%MCR	7,536	26,250	4,871	2,818	6,959	*	541	2169	13	788	78	420	498	15.8	78.8	236.3	1,118.3	0	0	---	6,090	20
HLV.min	5,443	37,500	6,959	4,026	9,941	*	660	2,643	16	960	96	512	607	19	96	288	1,363	0	0	20	8,701	20

	No.	20	21	22	23	24	25	26	27	28	29										
	LHV	cooling air	cooling air	air from bunker	air from primary fan inlet	air from preheater	air from secondary fan inlet	air from secondary fan outlet	flue gas from economizer	flue gas from bag filter inlet	flue gas from bag filter outlet										
	kJ/kg	m ³ /h	°C	m ³ /h	°C	m ³ /h	°C	m ³ /h	°C	m ³ /h	°C										
HLV.max	8,792	13,600	20	13,600	95	70,615	20	84,215	32	84,215	110	35,776	20	35,776	20	152,674	190	156,322	155	156,322	150
110%MCR	7,536	13,600	20	13,600	95	89,257	20	102,857	30	102,857	160	34,274	20	34,274	20	180,082	195	184,385	155	184,385	150
100%MCR	7,536	13,600	20	13,600	95	79,907	20	93,507	31	93,507	160	31,186	20	31,186	20	163,738	190	167,623	155	167,623	150
70%MCR	7,536	13,600	20	13,600	95	51,855	20	65,455	36	65,455	160	21,816	20	21,816	20	114,603	185	117,336	155	117,336	150
HLV.min	5,443	13,600	20	13,600	95	68,364	20	81,964	32	81,964	220	17,131	20	17,131	20	139,669	190	143,000	155	143,000	150

-(*) : The material in the chart is the value of each incinerator

Process	Input (A)	Qty (kg/h)	Output (B)	Qty (kg/h)
Incinerator + Boiler	Waste	75,000	Flue gas from economizer	407,463
	Ammonia	224	Bottom ash (wet)	19,882
	Dilution Water	1200	Water loss	2,088
	Leakage Air	22,500.79		
	Primary air	241,809.10		
	Secondary air	80,647		
	Quenching water	8,052		
	Subtotal	429,433	Subtotal	429,433
Deacidification Tower	Flue gas from economizer	407,463	Flue gas (bag filter outlet)	412,992
	Cooling Water	1,546	Fly ash	2,250
	Lime Slurry	6,198		
	Activated carbon	36		
	Subtotal	415,242	Subtotal	415,242
Ash Stabilization	Fly ash	2,250	Fly ash stabilized	3,195
	Chelate	45		
	Cement	225		
	Water	675		
	Subtotal	3,195	Subtotal	3,195
TOTAL INPUT (A)	847,870	TOTAL OUTPUT (B)	847,870	

TANJUNG DUA BELAS SANITARY LANDFILL (TG12SL2)

Size of Landfill:

Existing:

TG12SL1 (160 acres)

Proposed Expansion:

TG12SL2 including ISWMC (70 acres)

Landfill Phasing

Existing :

Phase 1- Phase 6

Cell 1 to 63

Proposed:

Phase 7 & 8 Cell 64 to 83 –

TG12SL 2



Lifespan of the Landfill (Expansion for TG12SL2)

The proposed expansion is expected to be operational for approximately 30 years.

Receiving Tonnage for existing & expansion:

Current: 2,400 ton/day

Current Waste Density (Compacted): 800 kg/m³

Proposed waste handling in TG12SL2 & ISWMC component: 500 ton/day

Facilities

The new expansion area (TG12SL2) will share the same facilities as TG12SL1. The new expansion area will only involve a leachate treatment plant expansion, a detention pond and new waste cells.

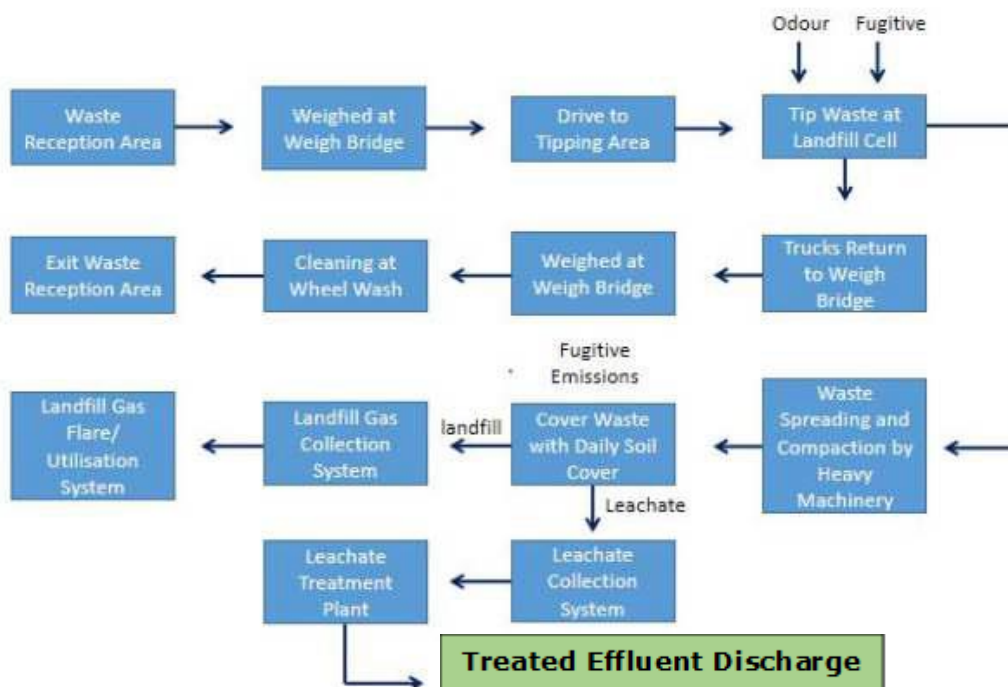
Types of Waste

- All municipal solid wastes shall be collected from residential, commercial, industrial (non-scheduled waste), governmental or institutional establishments, and community (markets, community centre) areas.
- Scheduled waste (toxic or hazardous), explosive, burning or smouldering waste and bio-medical wastes. Not accepted in the landfill.

Landfill Dimensions (new expansion):

- Flat and low-lying area (RL 4.30 m to RL 6.27 m).
- There is no deep excavation due to the high level of groundwater.
- The excavation on original ground level only for construction of earth bund's base with estimated depth between 0.3 m to 0.6 m, subject to groundwater level encountered during excavation work carry out.
- Landfill is recommended to be profiled at gradient of 1V:6H (V for vertical and H for horizontal) for first to third tier and 1V:10H for last tier with 6m high each tier except 3rd tier which has 5m high only. 3m high earth bund proposed surrounds the landfill area as barrier and protection for the waste slope.

GENERAL PROCESS FLOW OF TANJUNG DUA BELAS SANITARY LANDFILL AND FUTURE TG12SL2



DETAIL CALCULATION FOR TANJUNG DUA BELAS SANITARY LANDFILL PHASE 2 (TG12SL2)

Table 5.11: Estimation on Capacity and Life Span of the Proposed Expansion Sanitary Landfill and Merging with the Existing TG 12

No.	Tier	Height (m)	Overall			Waste Capacity Without Daily Cover		Daily Cover (Earthfill)		Waste Capacity with Daily Cover		Lifespan (years)	Remarks
			Cells	Bottom Area (m ³)	Top Area (m ³)	Volume (m ³)	Conversion (tonnes)	Volume (m ³)	Conversion (tonnes)	Volume (m ³)	Volume (tonnes)		
1.	2	15	P7 (C64 – C67)	97,400	14,100	836,250	836,250	150,525	83,625	752,625	752,625	0.86	Without WTE
2.	2	15	P8 (C68 – C83)	133,000	39,400				77,580	698,220	698,220	0.80	
2a.			(60% of total volume)			775,800	775,800	139,644	51,720	465,480	465,480	4.25	With WTE
2b.			(40% of total volume)			517,200	517,200	93,096	75,300	677,700	677,700	6.19	
3.	2	15	P5 & P7 Merging TL20	24,300	76,100	753,000	753,000	135,540	0	668,250	706,050	6.45	With WTE
4.	2	11	P5 & P7 Merging TL31	82,300	39,200	668,250	668,250	0	78,450	141,210	137,907	6.30	
5.	2	15	P5 & P7 Merging TL20	233,100	155,400	784,500	784,500	141,210	76,615	689,535	689,535	30.94	
6.	2	11	P5 & P7 Merging TL31	94,500	44,800	766,150	766,150	137,907	443,290	797,922	4,657,860	4,657,860	
			Total			5,101,150	5,101,150	797,922	443,290	4,657,860	4,657,860	30.94	

Source: Nexus EC Sdn. Bhd., 2023

Notes:

876,000 tonnes per annual

2,400 tonne daily Waste without WTE

400 tonne daily Waste with WTE & ISWMC Components

1 tonne waste = 1 m³ waste

1 m³ waste = 1 tonne waste

1 m³ earth fill = 1.8 tonne earth fill

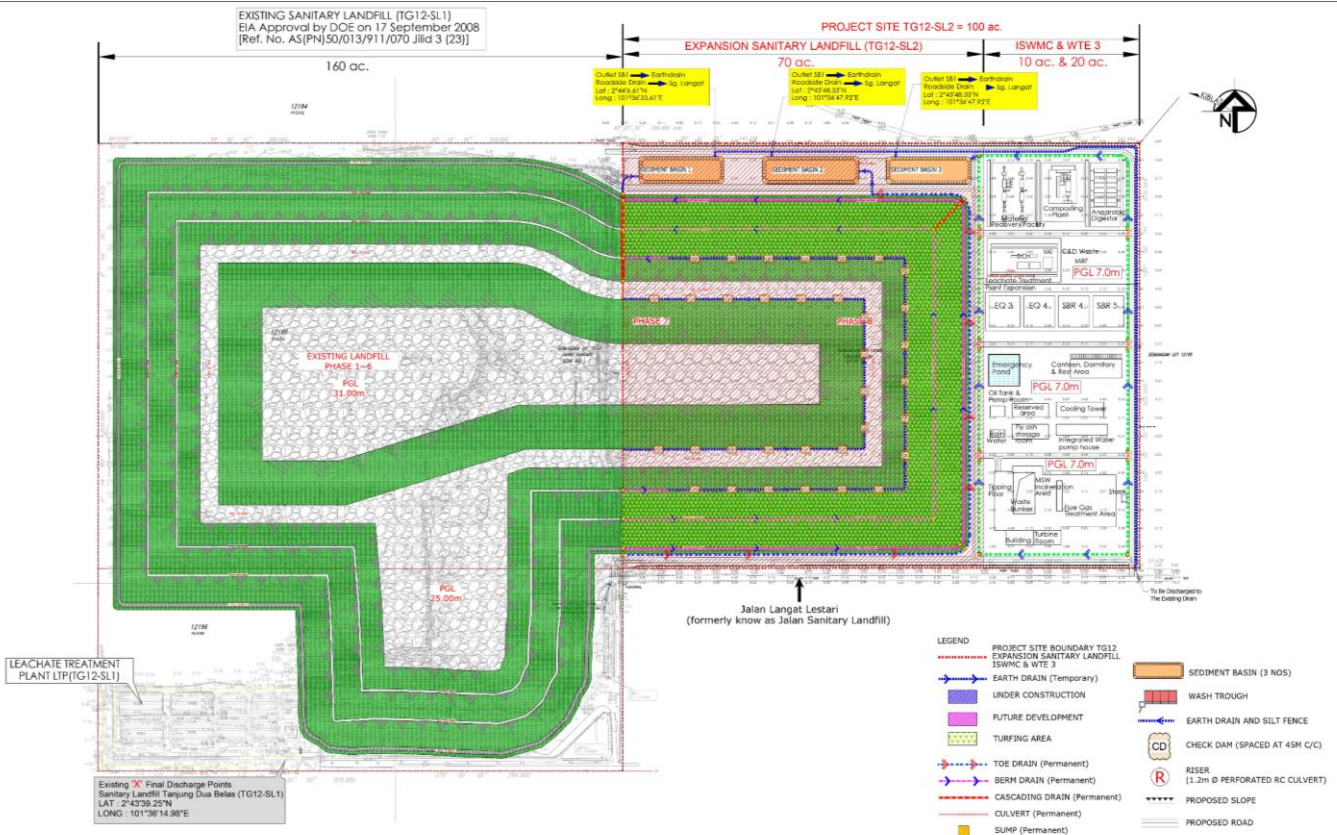
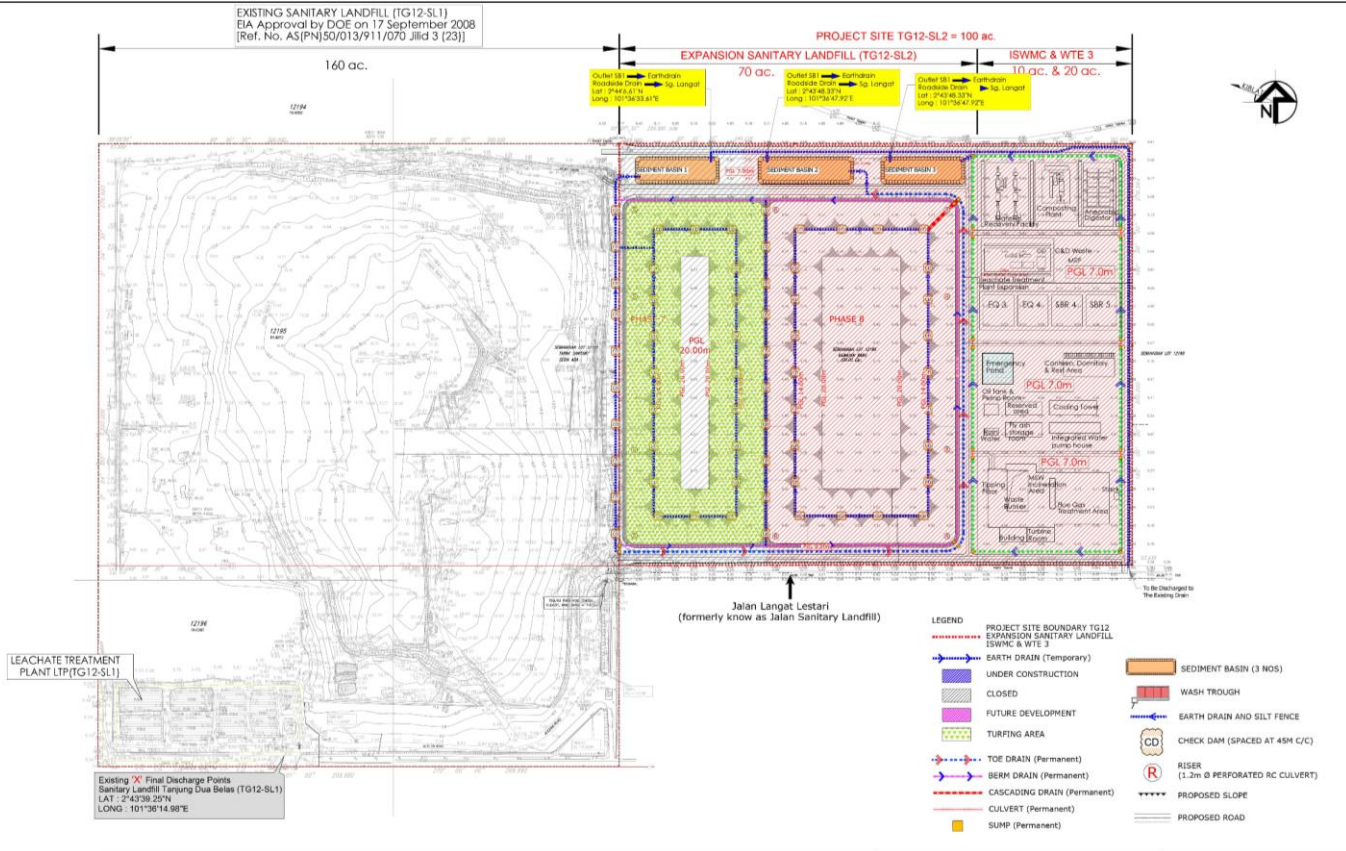
Density (mg/m³): MSW

1

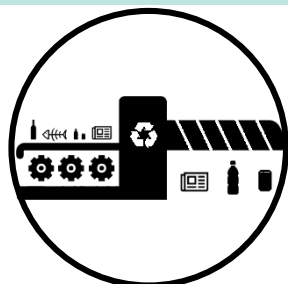
Earth fill/

1.8

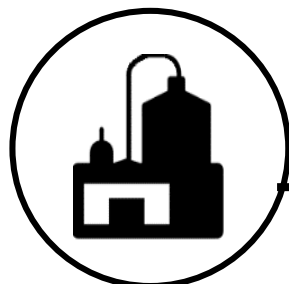
PHASE OF DEVELOPMENT OF CELL 68 TO CELL 83 AT TG12SL2



Integrated Solid Waste Management Centre (ISWMC) Waste Treatment Facilities



Materials recovery facility (MRF) plant for municipal solid wastes (a sorting system to recover valuable recyclables) at a capacity of **100 tons per day (TPD) capacity plant**



Anaerobic digestion (AD) plant for organic wastes (a component of municipal solid waste mainly from MRF rejects) at a capacity of **20 tons per day (TPD) capacity plant**



Composting plant of garden and landscape waste (a component of solid waste, or green waste) at a capacity of **50 tons per day (TPD) capacity plant**



Construction & demolition wastes material recovery plan (C&D MRF) (which is a component of solid wastes) at **30 tons per day (TPD) capacity plant**

Fuel and Chemical Consumption for WTE3 Plant

Consumables	Quantity (MT/h)	Application	Storage
Light Diesel Oil	174 MT/yr (8,200 kg/t waste)	Auxiliary fuel for start-up, shut down and maintain temperature at set level	Oil Tank Area
20% Ammonia	0.224	In-boiler denitrification	Ammonia Tank area
Calcium hydroxide (lime slurry)	6.198	Absorbent to neutralize acid gases	Calcium Hydroxide Silo
Activated Carbon	0.036	Adsorbent to remove heavy metals and PCDD	Activated Carbon Silo

WASTE GENERATION



CONSTRUCTION STAGE



✓ Biomass waste

Type	Extent (Ha)	Average AGB (tonnes/Ha)	Total AGB (tonnes)
Secondary Forest Trees and shrubs	40.47	46.6	1,885.84

✓ Domestic waste

Generation of 200 kg/day (200 PE)

✓ Construction waste

Particularly the ISWMC and WTE3 (area size= 121,406 m²) is estimated to be 971.25 tonnes

✓ Scheduled waste

Expected to generate SW305, SW306, SW408, SW409, SW410, etc

✓ Sewage waste

Estimated to generate 45,000 L/day (for 200 workers)

OPERATIONAL STAGE



✓ Solid Waste

Solid Waste	Estimated Quantity (MT/d)
Administrative & Domestic waste i. Food waste and packaging ii. Empty bottles and cans iii. Papers	0.08 [Calculated based on 1kg/person/day]
WTE3 Plant and ISWMC Facilities i. Rejects from waste from bunker ii. Bottom ash from WTE3 gate	Bottom Ash = 334.08 t/d Fly ash = 54 t/d
ISWMC Treatment and Recovery Facilities i. Inert wastes from MRF plant ii. Sludge from AD plant iii. Inert wastes from C&D waste recycling plant iv. Inert wastes from Composting plant	Refer to waste flow.

✓ Sewage waste

Estimated to generate 19m³/day (for 80 workers + waste truck transporters)

✓ Scheduled waste

TG12SL2 & ISWMC Facilities Operation

-Expected to generate **SW305, SW306, SW307, SW409, SW410.**

-Combustible in nature and can potentially be fed into the WTE3 grate as feedstock for energy recovery; Subjected to approval by DOE under Special Waste Management OR shall be sent to prescribed scheduled waste recovery facilities.

-**SW204** from leachate treatment plant

-Shall be required to be disposed under Special Waste Management .

WTE3

-Expected to generate SW104 (bottom ash & fly ash).

Bottom ash generation

-will be used for nearby sanitary landfill as soil covering due to its inert characteristics

Fly ash generation

-The management of fly ash depends on the TCLP and TTLC analysis to be conducted to determine its treatment whether the fly ash after solidification can be disposed at landfill or to be sold to brick factory post obtaining Special Management approval from DOE.



LEACHATE MANAGEMENT



- ✓ Low and high concentration waste stream shall be treated in a leachate treatment system expansion and tertiary treatment system within the existing Leachate Treatment Plant for Tanjung Dua Belas Sanitary Landfill.
- ✓ Treated leachate water to be recycled back to the WTE complex for use as make up water for circulating cooling water tank.
- ✓ As a minimum requirement, leachate water shall be treated to meet Acceptable Conditions for Discharge of Leachate, Second Schedule (Regulation 13) of the Environmental Quality (Control of Pollution from Solid Waste Transfer Station and Landfill) Regulation 2009.
- ✓ This will allow the treated waste water to be discharged in the event that the treated waste water is not recycled for plant process use when the WTE plant is shut down for maintenance.

Design Flowrate For the LTP Extension

NO	SOURCE	QUANTITY (M ³ /D)
1	Sanitary Landfill	1,520
2	WTE 3 Plant Low Concentration Waste	90
3	WTE 3 Plant High Concentration Waste	535
4	MRF	12
5	Anaerobic Digester	7
6	Composting	23
	TOTAL	2,187

Existing Final Discharge Point



Final discharge point of the existing Leachate Treatment System (LTS) at Tanjung Dua Belas Sanitary Landfill shall remain in use for the LTS expansion.

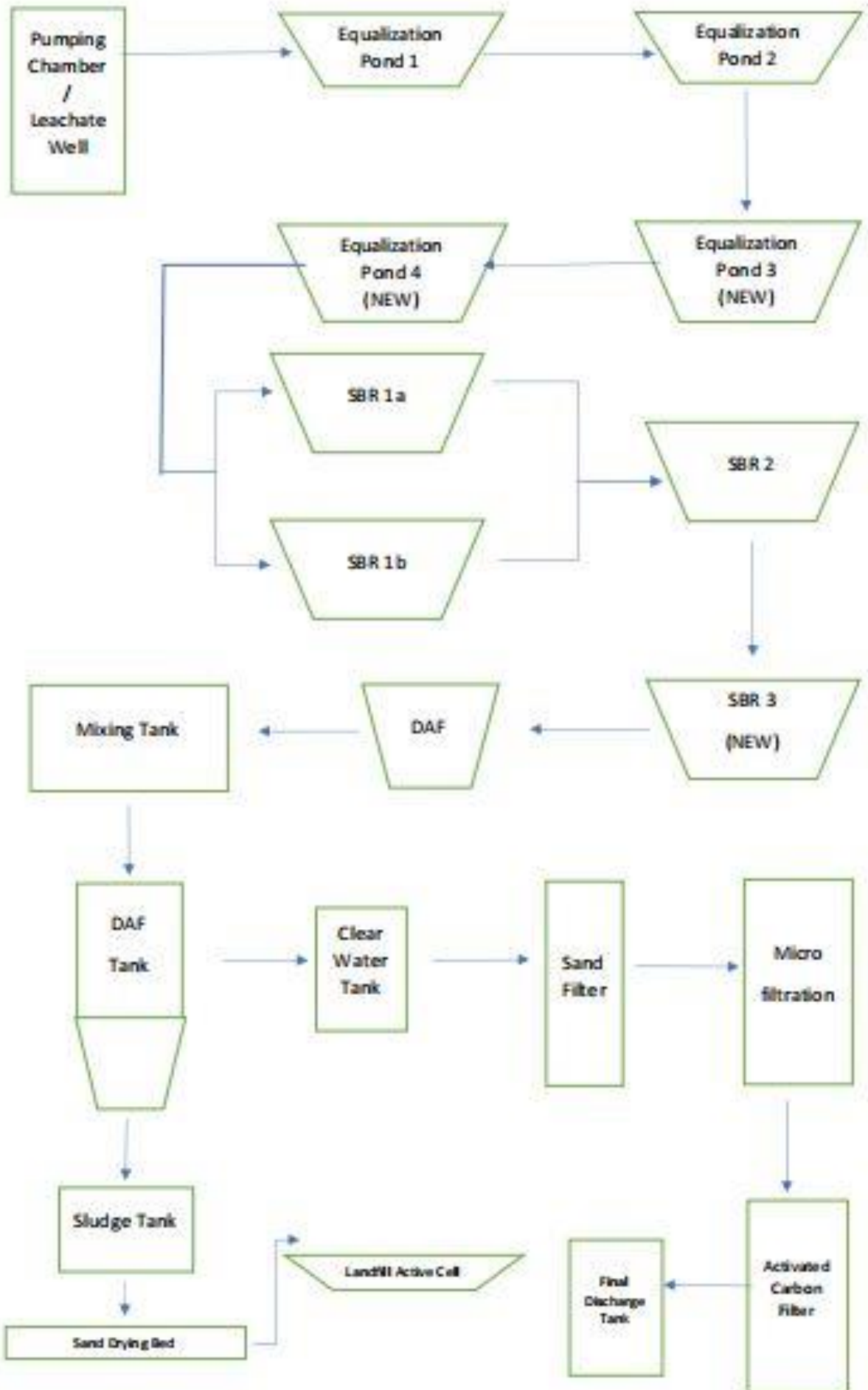
Coordinate:

N 02°43' 39.25"

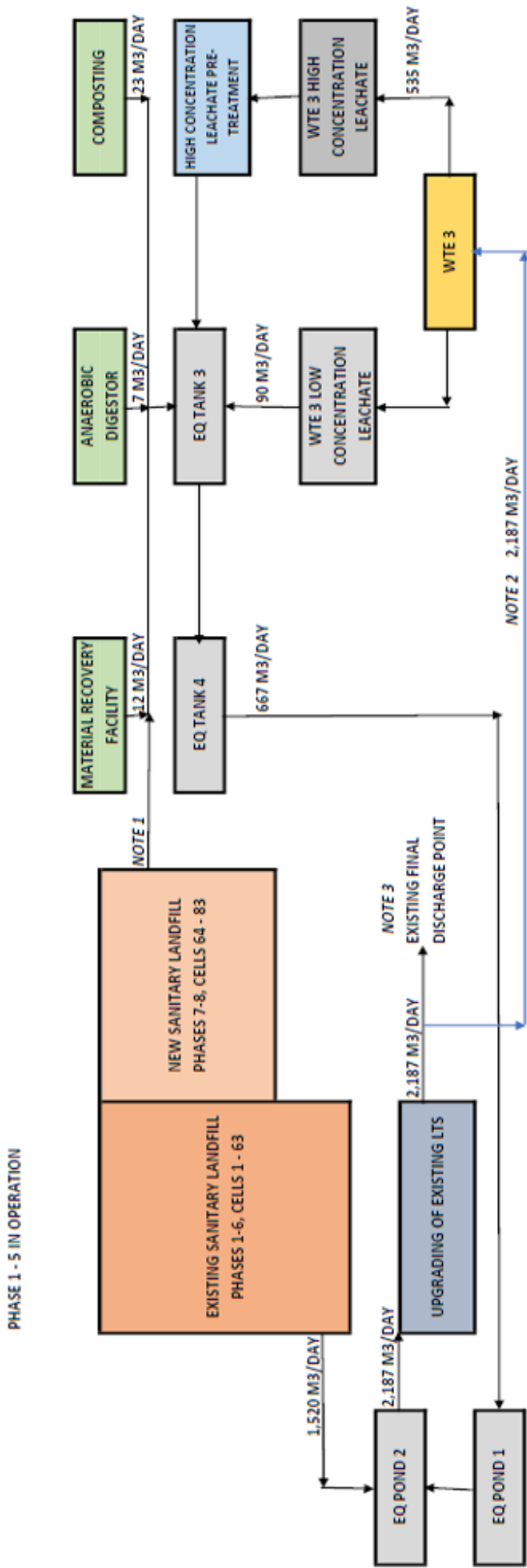
E 101°36' 14.98"

Please refer to **Figure 6.13** for the location of current LTP Final Discharge.

LTP PROCESS FLOWCHART

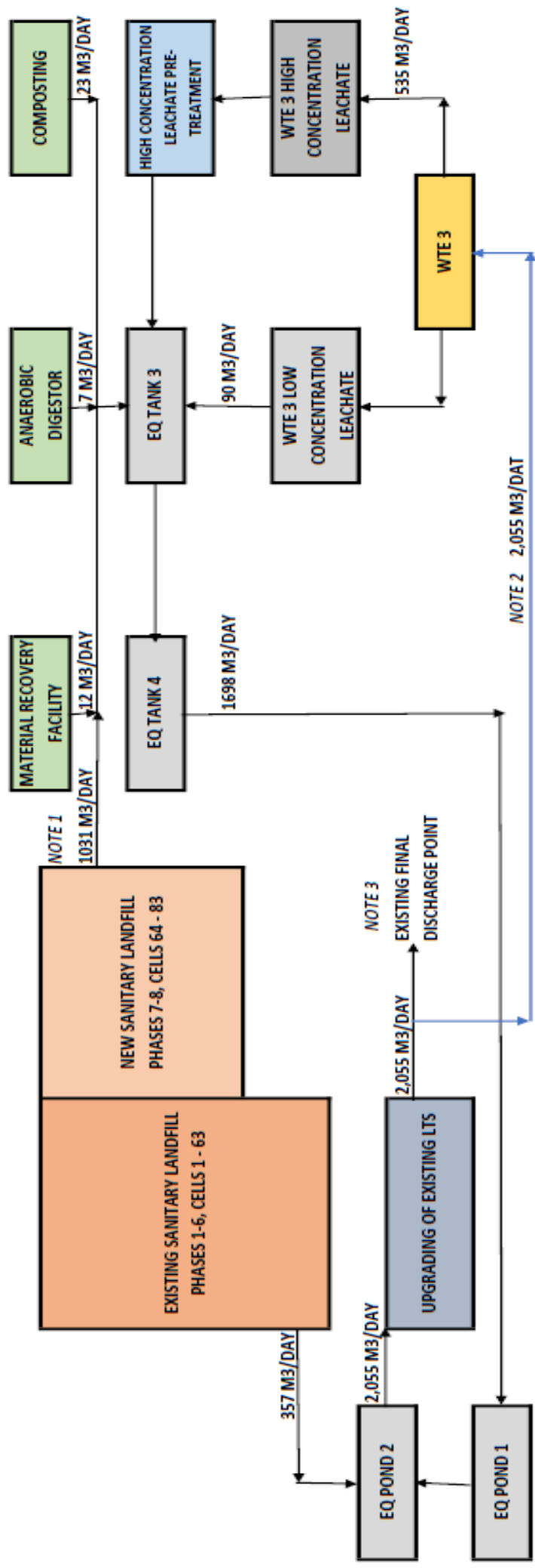


SCHEMATIC DIAGRAM FOR COMBINED LEACHATE TREATMENT SYSTEM AT ISWM (PHASE 1-5)



SCHEMATIC DIAGRAM FOR COMBINED LEACHATE TREATMENT SYSTEM AT ISWM (PHASE 8)

Phase 8 in operation
 Phase 7 closed
 Phase 1 - 6 closed



EXISTING ENVIRONMENT – PHYSICAL ENVIRONMENT



TOPOGRAPHY

Generally characterized as low-lying flat terrain with average elevations ranging from RL 4.30 m to RL 6.27 m above mean sea level (msl).

- The highest point is RL 6.27 which located at the southwestern part of the site area.
- The lowest point is RL 4.30 which located at the southeastern part of the Project Site.

WTE3 & TG12SL2 Project Site

- The proposed thermal treatment plant (WTE3), Integrated Solid Waste Management Centre (ISWMC) and expansion of TG12 Sanitary Landfill Phase 2 (TG12SL2) is located on the eastern region of the existing TG12 Sanitary Landfill (TG12SL1).



HYDROLOGY

- The TG12SL2 Site is located on a low-lying flat terrain.
- Sg Langat is located about 6 km to the north of the Project site and the flow direction is from east to west.
- The earth drains from TG12SL Sites flow towards south eastern area into a channelized Sg. Langat which flows northerly and eventually discharge into the Straits of Melaka.
- There is one (1) water intake point and water treatment plant (Labohan Dagang) located approximately 13km downstream of the proposed Project Site.



GEOLOGY

The regional geology of the proposed development is situated Beruas Formation which consists of peat, humic, clay, silt and to a lesser extent sand and gravels. This can be further confirmed by the presence of peat and clay at the site that can be referred in engineering borehole log. There are no geological fault lines within the Project Site.

EXISTING ENVIRONMENT – PHYSICAL ENVIRONMENT



SOIL INVESTIGATION

According to the Reconnaissance Soil Map of Peninsular Malaysia (Pindaan 2002): -
The soil within the Project Site is classified as peat soil.

- a) Subsoil Layer 1 ($0 < N \leq 10$) – Very Loose PEAT- 2.0m to 3.0m thick.
- b) Subsoil Layer 2 ($0 < N \leq 19$) – Very Soft to Very Stiff CLAY- 3 to 36 m thick.
- c) Subsoil Layer 3 ($10 < N \leq 49$) – Medium Dense to Dense SAND or silty -3 to 15 m thick.
- d) Subsoil Layer 4 ($N > 50$) – Very Dense SAND or silty SAND



GROUNDWATER

The nearest tube well is located at Bandar Seri Ehsan which is 4.5 km northeast of the Project Site, could be correlated to the groundwater volume. The tube well at Bandar Seri Ehsan indicates that the groundwater could yield between $>10.0 - <20.0$ meter³/hour.



LANDUSE

- I. Forest is the prevalent land use, with a total area of 12,166.44 acres (54.33% of the impact area). Forest area determines the landscape of the total impact area which consists of lowland forest.
- II. The main cultivated crops in the vicinity of the Project Site are horticulture (oil palm) which covers approximately 6,366.71 acres (28.42%) of the impact area.
- III. The third most prevalent land use of the surroundings is open area with 3,073.62 acres or 13.73% of the total impact area.
- IV. The residential takes up 315.45 acres or 1.41% of the total impact area. The residential areas surrounding the project site are Aerofront city, Bandar Seri Ehsan, Kampung Sg. Kelambu, Kampung Tumbok Darat and Kampung Ulu Teris.
- V. The Project Site covers approximately 0.45% of the total impact area mainly comprises of idle grassland/lalang and forest.

EXISTING ENVIRONMENT – BIOLOGICAL ENVIRONMENT

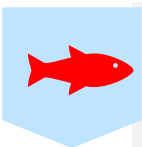


FLORA AND FAUNA

- The proposed project site is located within peat swamp forest.
- Nearest forest reserve is HSK Kuala Langat Selatan which located to the south (~300m) and west (~600m).
- HSK Kuala Langat Selatan is part of South Kuala Langat Peat Swamp Forest (SKLPSF) where it also included two designated forest reserve area as HSK Kuala Langat Selatan Tambahan.
- Based on Rancangan Tempatan Kuala Langat 2030 (Pengubahan 2), proposed project site is not part of gazetted Environmental Sensitive Area (ESA).
- The Proposed Project Site is not listed as Important Birds and Biodiversity Area (IBA)

Wildlife Species Checklist

- A total of 34 species which composed 4 mammal species, 19 bird species, and 10 herpetofauna species (6 reptilian, 4 amphibians) successfully recorded via direct/indirect observations and camera trap survey which conducted from 17th October 2022 until 19th November 2022.
- Hence total successful camera trapping effort for this study was 34 nights/days from eight (8) camera traps (Camera 2 and Camera 10 were lost during sampling period). Based on the IUCN Red list classes (IUCN 2023), 2 species listed as threatened group (Endangered & Vulnerable) while remaining 32 species listed as lower risk group (Least Concern).



AQUATIC SPECIES

- No aquaculture activities observed within the vicinity of proposed project site. Based on DOF Selangor [Date: 23rd March 2023; Ref. PRK.SEK/13/H/JLD14 ()] no fisheries aquaculture activities exist within the vicinity of proposed project site. All ponds for aquaculture no 52, 53 and 59 were utilised to farm breeding *Clarias spp.* (Keli) and *Pangasius spp.* (Patin) and catfishes.
- No sampling conducted for peat swamp fishes, thus species checklist was based on study conducted for at Raja Muda Peat Swamp Forest Reserves (Norhisyam et al. [2012]; Ryon et al., [2014]; Ahmad et al., [2015]) and Sg. Karang Peat Swamp Forest Reserves (Ahmad et al., 2015).
- At least 59 peat swamp fish species from 15 families were expected to be presence at surrounding proposed project and South Kuala Langat Peat Swamp Forest (SKLPSF).
- According to IUCN Red list classes (IUCN, 2023) peat swamp fishes which had been reported from respective studies can be categorized into the following categories: 2 species as Endangered; 2 species as Vulnerable; 2 species as Near Threatened; 27 species as Least Concern; 2 species as Data Deficient; while remaining 24 species is not evaluated.

EXISTING ENVIRONMENT – SOCIO-ECONOMIC & HUMAN ENVIRONMENT



SOCIO-

A total of 365 respondents from the identified 27 residential areas within the 5-km ZOI was surveyed on 12 – 15 May 2023. The final respondent count was at 370 respondents with Bandar Seri Ehsan, Kg Labohan Dagang and Taman Langat Murni 85.1% and whilst Kg RTB Bukit Changgang at 14.9% of the total respondents. Main issues Raised during the FGD are as in the table:-

FGD	Issue/ Problem/ Request	Suggestion/ Comments
FGD 1	Health and Social Welfare <ul style="list-style-type: none"> Due to the existing odor issue brought forth by the nearby recycled paper mill, a negative perception was given by the local community towards the Project. The attendees suggested that the Project Proponent need to have the initiative to develop a landfill that does not contribute to environmental pollution, particularly air pollution 	<ul style="list-style-type: none"> The Ketua Kampung supports the Project with conditions if the Project is beneficial and has advantages in the future. Proposed the development of the Project be done in a closed and controlled area. To overcome the issue of foreign workers, the community leader suggested that the Project Proponent to hire locals during the Project development as well as garbage truck drivers during the operational phase. The community leader also suggested to control and monitor existing foreign workers as well as garbage truck drivers and collectors to ensure issues brought forward does not occur in the future.
	Infrastructure and Road Network <ul style="list-style-type: none"> The cited that the existing road network is still adequate and traffic flow is smooth. Nevertheless, during the operational phase of the Project, traffic flow and accessibility will be affected, especially during peak hours on weekdays. 	
	Livability <ul style="list-style-type: none"> The attendees requested increased provisions of cemeteries as it is a social need for the non-muslim population. They note that the expansion and upgrading of the Project is a social need for the population of Selangor to ensure that environment within the locality is preserved. 	
	Others <ul style="list-style-type: none"> Council members and ketua kampung suggested that the garbage trucks can be better replaced so that the drivers do not release any leachate onto public roads which can cause pollution. They also expressed their concerns on increased negative impacts such as cleanliness issues and nuisances caused by the foreign workers associated with the development of the Project. Concerned on the negative social impact brought on by the presence of foreign workers. 	

EXISTING ENVIRONMENT – SOCIO-ECONOMIC & HUMAN ENVIRONMENT



SOCIO-ECONOMIC AND HUMAN ENVIRONMENT

Main issues Raised during the FGD are as in the table:-

FGD	Issue/ Problem/ Request	Suggestion/ Comments
FGD2	<p>Health and Social Welfare</p> <ul style="list-style-type: none"> Residents of Bandar Seri Ehsan had a negative perception towards the Project as they are experiencing air pollution in the form of odor originating from the existing Tanjung Dua Belas Landfill. The odor issue is most prominent during night time and when it is raining. Odor is also brought by leachate being released by the garbage trucks along public road. They also cited that garbage are not collected as per the allocated scheduled. 	<ul style="list-style-type: none"> Suggested to have a segregated road system between heavy vehicles and garbage trucks and light vehicles.
	<ul style="list-style-type: none"> Negative perception towards the Project as Bandar Seri Ehsan is located approximately 4 km from the existing landfill. 	
	<p>Infrastructure and Road Network</p> <ul style="list-style-type: none"> Concerned that road damages will occur especially during the construction period due to movement of heavy vehicles. Negative perception towards presence of heavy vehicles as it will increase the likelihood of road accidents for the residents. <p>Economic Impact</p> <ul style="list-style-type: none"> In view that the Project will impact the land value of Bandar Seri Ehsan. <p>Quality of Life</p> <ul style="list-style-type: none"> Negative perception towards the use of incineration as a waste disposal method. The production of toxic smoke that can cause various sickness They are of the opinion that the Project will be able to solve the existing air pollution issues Stated that the Project will bring negative impact in the form of odor pollution in the event the concessionaire or Project Proponent does not operate the Project in an efficient and sound manner. 	

EXISTING ENVIRONMENT – SOCIO-ECONOMIC & HUMAN ENVIRONMENT



SOCIO-ECONOMIC AND HUMAN ENVIRONMENT

Main issues Raised during the FGD are as in the table:-

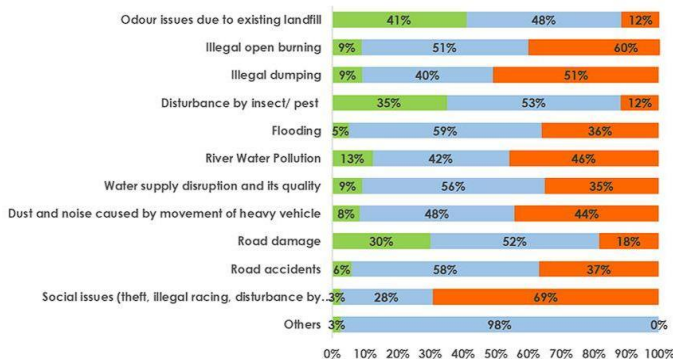
FGD	Issue/ Problem/ Request	Suggestion/ Comments
FGD3	<p>Infrastructure and Accessibility</p> <ul style="list-style-type: none"> Requested for the On-site Detention (OSD) tank be provided for the Project Requested that the drainage be designed to ensure it is sufficient and adequate to cover the entire surface flow of the proposed area. <p>Health and Social Welfare</p> <ul style="list-style-type: none"> Pejabat Kesihatan Kuala Langat has not received any complaints from the local or surrounding residents regarding illnesses caused by the existing landfill. <p>Others</p> <ul style="list-style-type: none"> The technical agencies proposed for the Project Proponent to engage with LUAS and the Forestry Department in view that the Project is located close to the Kuala Langat Forest Reserve. This is view that wild animals will likely enter the Project site during construction and operation of the Project. 	<ul style="list-style-type: none"> Suggested to have a segregated road system between heavy vehicles and garbage trucks and light vehicles.

EXISTING ENVIRONMENT – SOCIO-ECONOMIC & HUMAN ENVIRONMENT

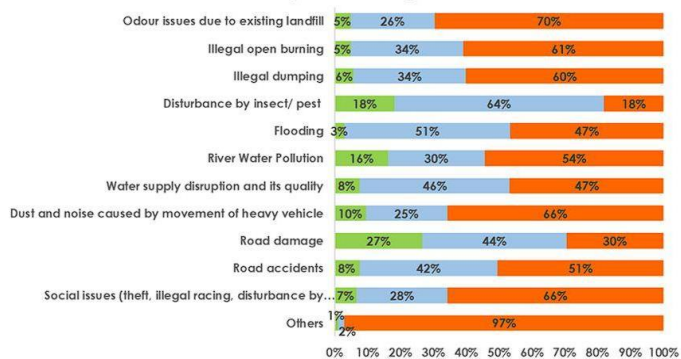


Existing Social Issues and Problems

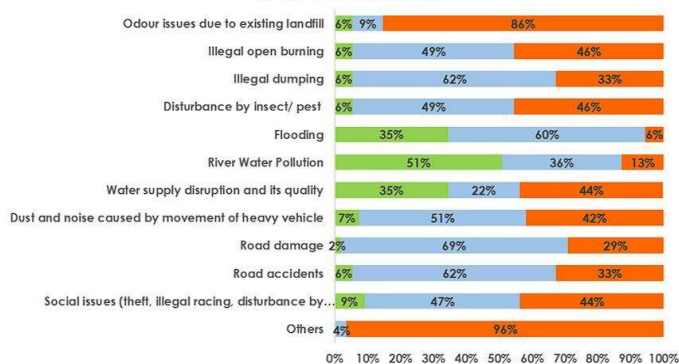
Bandar Seri Ehsan



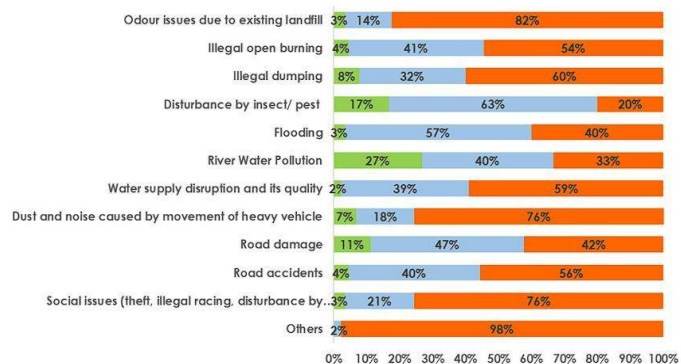
Taman Langat Murni/Langat Utama



Kg RTB Bkt Changgang

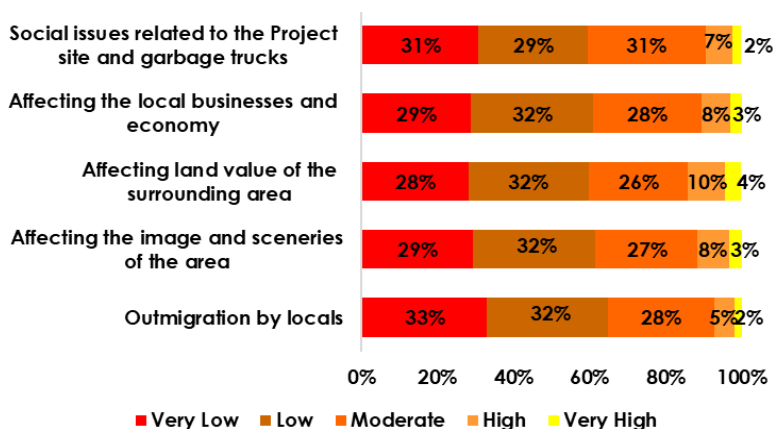


Kg Labohan Dagang



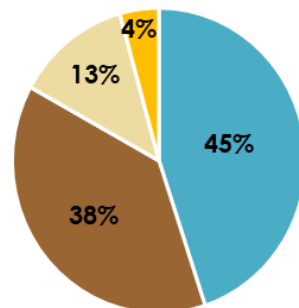
■ Happens often
 ■ Happens sometime
 ■ Does not happen

Level of Acceptance Towards the Project



Level of Acceptance Towards the Project

■ In favour
■ In favour with conditions
■ Not in favour
■ No comment





EXISTING ENVIRONMENT – PUBLIC HEALTH ENVIRONMENT

	Klinik Kesihatan Teluk Datok	Hospital Banting
Eye and respiratory diseases	Represented by conjunctivitis, upper respiratory tract infections, asthma, tuberculosis, pneumonia and chronic bronchitis made up 7.6% and 24.2% of all adult and children cases	Represented by conjunctivitis, upper respiratory tract infections, influenza, asthma, tuberculosis, pneumonia, chronic bronchitis, emphysema and lung cancer made up 11.7% of all adult and 22.5% of all children cases.
Cardiovascular diseases	Represented by hypertension, ischaemic heart disease and cerebrovascular accident or stroke made up only 1.4% of all adult cases.	Represented by hypertension, heart failure, ischaemic heart disease and cerebrovascular accident/stroke made up 1.5% and 0.07% of all adults and children cases.
Disease cases related to water pollution	No disease case related to water pollution.	represented by dysenteries, typhoid and paratyphoid, and food poisoning made up 0.003% and 0.02% of all adults and children cases.
Disease cases related to animal vectors and reservoirs	Only dengue fever cases were reported, and they made up only 0.09% and 0.15% of all adult and children cases, respectively. Therefore, vectorborne and animal reservoir transmitted diseases are also uncommon in the area.	Only dengue fever cases and a typhus case were reported, with dengue fever being the most common disease reported. These animal vectors and reservoirs related disease cases made up 0.26% and 0.09% of all adult and children cases, respectively.
Skin disease cases	Dermatitis and eczema, urticaria and erythemas made up 0.8% and 2.6% of all adult and children cases, respectively. The most common skin diseases reported were urticaria, dermatitis and eczema.	Represented by cutaneous abscess/furuncle and carbuncle, cellulitis, dermatitis and eczema, psoriasis, urticaria, disorder of skin appendages and erythemas, made up 1.7% and 1.0% of all adult and children cases.



EXISTING ENVIRONMENT – TRAFFIC

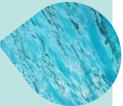
Existing Traffic at Existing Road Network in Year 2023

Road Segment	Direction	Capacity (pcu/hour)	Peak hour Traffic Flow (pcu/hour)		Volume/ Capacity (LOS)	
			AM	PM	AM	PM
Jalan Labohan Dagang Nila (Route 32)	To Nilai	2,400	1,606	1,038	0.67(B)	0.43(A)
	To Labohan Dagang	2,400	1,069	1,529	0.44(A)	0.61(B)
Jalan Sanitary Landfill	Both way	1,200	297	360	0.25(A)	0.30(A)

Source: RSI Consultant

- The results show that existing road within the vicinity of the sanitary landfill site is still operating below the road capacity and it still in good LOS.

EXISTING ENVIRONMENT – PHYSICAL ENVIRONMENT (BASELINE WATER MONITORING)



WATER QUALITY

No.	Parameter (mg/L, unless otherwise stated)	SL2W1	SL2W2	SL2W3	SL2W4	SL2W4A	SL2W5	SL2W6	SL2W7	SL2W8 (M)	SL2W8 (F)	SL2W9 (M)	SL2W9 (F)	SL2W10 (M)	SL2W10 (F)	SL2W10 (E)	SL2K1 (M)	SL2K1 (E)	Class IIA (DOE)	Recommended Raw Water Quality Criteria (MOH)
**WQE Parameters																				
1	pH	7.31	7.21	5.91	7.22	7.52	7.10	7.15	6.49	6.72	6.59	6.7	6.68	6.59	6.48	5.31	5.31	5.29	6.0 - 9.0	5.5 - 9.0
2	Temperature, °C	31.1	30.7	31.2	28.0	28.2	28.3	28.6	30.6	28.4	28.5	28.5	28.6	28.6	28.7	29.8	29.8	29.9	-	-
3	Chemical Oxygen Demand (COD) _{Mn}	35	34	1187	610	648	293	328	274	22	14	13	12	19	18	417	417	324	25	10
4	Biochemical Oxygen Demand (BOD) _{5@20}	3	5.2	3.4	26	27	9	4.07	4.64	4.64	4.62	4.65	4.67	4.61	4.61	4.28	4.28	4.25	3	6
5	Dissolved Oxygen (DO) _{sat}	3.24	2.11	3.14	3.81	3.72	3.62	4.07	4.64	4.64	4.62	4.65	4.67	4.61	4.61	4.28	4.28	4.25	3-7	-
6	Total Suspended Solids (TSS) ₂₀	24	24	18	5	8	10	10	24	216	64	84	95	92	92	11	11	11	50	-
7	Oil & Grease (Oil/Grease) ₁₅	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	7; N	-
8	Ammoniacal Nitrogen, NH ₄ ⁺	4.3	11.7	8	125	136	44.9	37.9	35.5	2.1	1.7	1.5	1.7	2.0	2.0	4.6	4.6	4.9	0.3	-
9	Faecal Coliform, CFU/100ml	1520	1620	1320	18100	15900	3700	2800	2300	10	3000	3900	3900	3450	3450	10	10	10	100	-
10	Total Coliform, CFU/100ml	3200	400	2600	93000	78000	13000	14000	15000	3800	21400	2400	12000	12200	12200	1100	650	650	5000	5000
11	Salinity, mg/l	40	53	3042	801	651	409	380	366	276	276	69	81	80	80	578	450	450	50	1000
12	Conductivity, µS/cm	0.3	0.4	0.3	1.9	1.9	0.3	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1	50
13	Conductivity, µS/cm	865	711	532	1934	1992	633	598	548	130	130	147	146	148	148	241	241	240	-	-
**Heavy Metals																				
14	Mercury (Hg) ₂	<0.005	<0.005	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.05	0.005
15	Cadmium (Cd) ₂	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.01	0.005
16	Chromium Trivalent (Cr ₃₊)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	-
17	Chromium Hexavalent (Cr ₆₊)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.05	-
18	Arsenic (As) ₃	<0.005	<0.005	<0.005	0.007	0.007	0.005	0.005	0.005	0.015	0.015	0.007	0.009	0.005	0.005	0.005	<0.005	<0.005	0.05	0.01
19	Chloride (Cl) ₂	0.02	0.02	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	0.01
20	Copper (Cu) ₂	0.010	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.02	0.01
21	Copper (Cu) ₂	0.010	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.02	0.01
22	Manganese (Mn) ₂	0.015	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.02	0.01
23	Nickel (Ni) ₂	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.05	-
24	Tin (Sn) ₂	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.05	-
25	Zinc (Zn) ₂	<0.005	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	3.0	3.0
26	Boron (B) ₂	0.093	0.117	0.123	0.150	0.156	0.090	0.063	0.037	0.025	0.009	0.005	0.006	0.013	0.005	0.010	0.018	0.018	1.0	-
27	Iron (Fe) ₂	5.16	4.39	4.41	2.29	2.32	5.47	6.00	7.95	2.70	3.17	1.83	2.11	2.11	2.37	4.33	4.33	4.12	5.0	1.0
28	Argentum/Silver (Ag) ₂	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.05	0.05
29	Barium (Ba) ₂	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.01
30	Strontium (Sr) ₂	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	0.01	0.01
Other parameters																				
31	Fluoride (F) ₂	0.9	2.9	2.9	3.0	1.9	2.7	2.8	2.3	0.4	0.5	0.5	0.5	0.5	0.4	0.4	2.7	2.0	1.5	1.5
32	Formaldehyde	<0.1	<0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.01	0.002
33	Phenol	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.01	0.002
34	Sulphide (S) ₂	30	30	11000	5700	4600	2200	2400	2200	20	20	15	15	30	30	30	2400	2500	-	300 TCU
35	Color, ADMI	30	30	11000	5700	4600	2200	2400	2200	20	20	15	15	30	30	30	2400	2500	-	300 TCU
36	Titrate, ml	0.00	0.3	18.1	66.1	2.7	0.8	0.5	9.5	1.6	2.2	2.4	2.3	2.1	2.2	2.4	0.6	5.0	-	-
37	Total Phosphorus, TP	0.2	0.3	0.8	1.9	1.5	0.7	0.6	0.6	0.5	0.2	0.2	0.2	0.2	0.2	0.7	0.3	0.4	0.2	-
38	% DO saturation	87.2	73.3	37.2	20.5	11.2	36.7	63.3	87.5	83.4	87.0	85.8	92.7	85.3	79.2	84.2	84.2	86.3	-	-
39	Leptospira	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
40	Enterococci	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
41	Cyanobacteria	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
42	Flow rate m ³ /hr	5.63	5.65	49.19	1249.45	531.15	2813.92	3375.35	4758.19	69480.44	63613.70	116500.65	105284.39	120154.83	106463.35	571.12	518.17	518.17	-	-
43	Water Quality Index	85(III)	85(III)	26(IV)	40(IV)	39(IV)	50(IV)	49(IV)	53(III)	69(III)	75(III)	74(III)	74(III)	74(III)	73(III)	73(III)	43(IV)	46(IV)	-	-

Source: Environmental Science (M) Sdn. Bhd., National Water Quality Standard for Malaysia, Class IIA - Parameters of Second Schedule (Regulation 13) of Environmental Quality (Control of Pollution from Solid Waste Transfer Station and Landfill) Reg. 2009; Acceptable Conditions for Discharge of Leachate. Parameters of Drinking Water Quality Standard, MHR (2004) for Recommended Raw Water Quality

EXISTING ENVIRONMENT – PHYSICAL ENVIRONMENT (BASELINE MONITORING)

AIR QUALITY



- The baseline air quality conducted in 9th January to 13th January 2023 at:
 - A1 - existing TG 12 Sanitary Landfill next to the Project Site
 - A2 – Bandar Seri Ehsan
 - A3 – Taman Langat Murni
 - A4 – At Aerofront City Development (on-going construction)

All parameters are **within** the respective limits stated in the Malaysia Ambient Air Quality Standard (2020).

NOISE LEVEL



The baseline noise quality conducted in 9th January to 13th January 2023 at:

- N1 - existing TG 12 Sanitary Landfill next to the Project Site
- N2 – Bandar Seri Ehsan
- N3 – Taman Langat Murni
- N4 – At Aerofront City Development (on-going construction)

- All noise sampling locations during night-time were within the permissible limits against Guidelines for Environmental Noise Limits and Control, Third Edition 2021; Second Schedule (Limited Sound Level (LAeq)).
- Under the receiving land use category of low density residential and noise sensitive receptor, the maximum permissible levels (LAeq), Existing Built Up Areas were 60 dBA (day-time) and 55 dBA (night-time). Noise levels at N2 (i.e., 59.8 dBA day-time), were within the maximum permissible levels (LAeq) while existing noise level at N2 (i.e., 58.6 dBA night-time) had exceeded the maximum permissible levels (LAeq).
- Under the receiving land use category of mixed development, the maximum permissible levels (LAeq) For Existing Built Up Areas; Guidelines for Environmental Noise Limits & Control, 3rd Edition, were 65 dBA (day-time) and 60 dBA (night-time). Noise levels at N3 (i.e. 61.7 dBA day-time) were within the maximum permissible levels (LAeq) while existing noise level at N3 (i.e., 61.7 dBA night-time) had exceeded the maximum permissible levels (LAeq).
- Meanwhile, for the noise levels at N1 (i.e. 58.9 dBA day time & 51.6 dBA night-time) and N4 (i.e. 61.6 dBA day-time & 59.0 dBA night-time), there is no category of receiving land used to be considered under Second Schedule: Recommended Permissible Sound Level (LAeq) By Receiving Land Use For Existing Built Up Areas. Hence, the noise level to be maintained as the existing climate.



EXISTING ENVIRONMENT – PHYSICAL ENVIRONMENT (BASELINE MONITORING)

GROUND WATER QUALITY



- Baseline groundwater monitoring for Site TG12SL was conducted on 12 January 2023 in three (3) monitoring wells at the Proposed Tanjung Dua Belas Landfill.
- During baseline sampling, it can be concluded that the parameters Sulfate (at GW2), Iron and Hardness (CACO₃ at GW1), Total Coliform, Chloride, Nitrite (at GW3), Nitrate (at GW1(pm)), BOD, COD, Ammonia, Iron and Total Dissolved Solids have exceeded the KKM Acceptable Value for Recommended Raw Water Quality for the National Drinking Water Quality Standard, 2004 and the DOE National Groundwater Quality Standard for Conventionally Treated Drinking Water, 2017 on all three (3) points, namely. , GW1, GW2 and GW3.
- Parameters that exceed the limit are due to the activities of current landfills, oil palm plantations, surrounding landfills, industrial and anthropogenic activities.

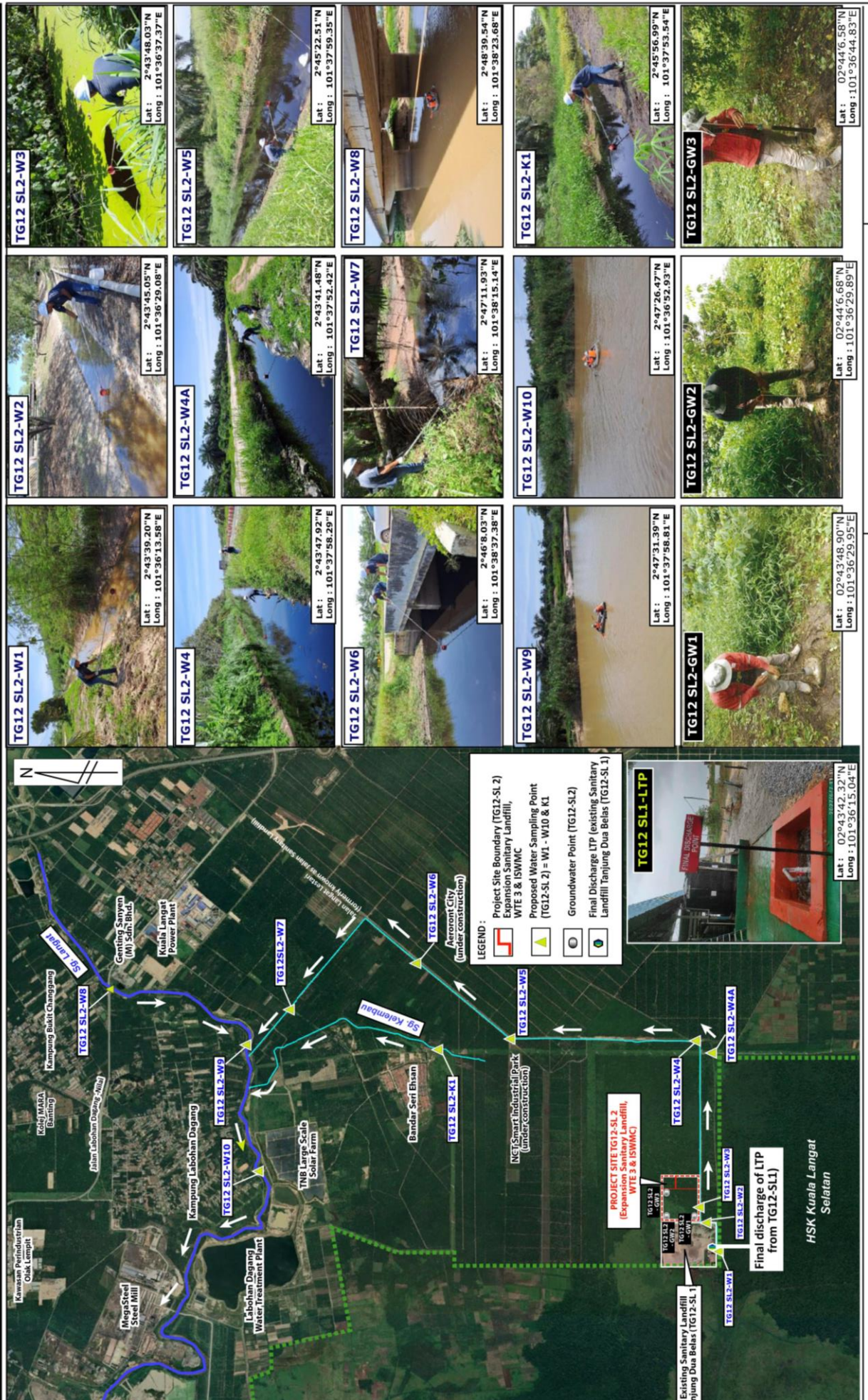
ODOUR ASSESSMENT



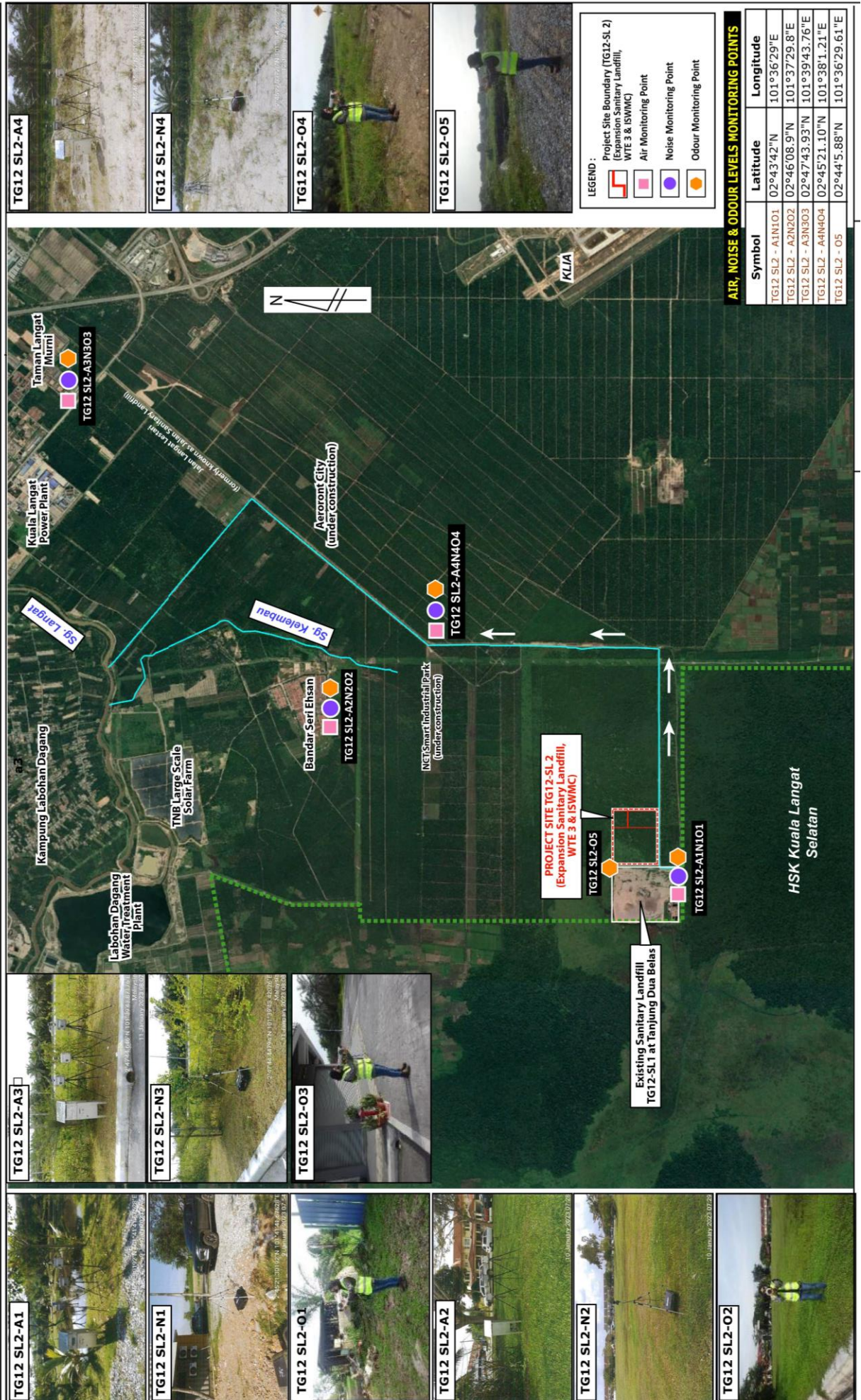
It could be observed that the highest D/T perceived for unpleasant smell (leachate/landfill smell) was 4 D/T at Junction leading to the sanitary landfill (O4).



BASELINE SAMPLING LOCATIONS (RIVER WATER & GROUNDWATER)



BASELINE SAMPLING LOCATIONS (AIR, NOISE & ODOUR)




CONSTRUCTION PHASE


ACTIVITIES : Site Clearing, Earthworks, Construction of Access Road, WTE3 Plant, Tanjung Dua Belas Sanitary Landfill TG12SL2, LTP Expansion and ISWMC Components.

RECEPTORS : Sg. Langat, Bandar Seri Ehsan (3.7km) and Aerofront Development (2.5km).


IMPACTS



Land clearing and earthworks **increases soil erosion risk** at the Project Site which will increase suspended solids in Sg. Langat.



Workers Quarters: Untreated sewage and sullage discharge from portable toilets or individual septic tanks will increase levels of DO, BOD, COD & NH₃-N in the rivers.



Improper discharge or spillage at construction sites leading to river water & soil contamination e.g., grease, diesel, etc.

POLLUTION PREVENTION AND MITIGATING MEASURES

- Proper design and implementation of **LD-P2M2** :
 - o Erosion control : turfing, mulching.
 - o Surface runoff control : temporary drains, check dams, sumps.
 - o Sedimentation control : three (3) Sediment Basins

Sewage Management

- Portable toilets or toilets with septic tank.
- All discharge treated to Standard A of EQ (Sewage) Regulations 2009.

Fuel, Oil and Lubricant Spillage Management

- Provision of skid tanks, oil spill kits, containment bunds and implementation of SW management in accordance with Environmental Quality (Scheduled Wastes) Regulation 2005.
- **Emergency Response Plan (ERP)** and contingency plans for accidental spill incidents.

OPERATION PHASE

ACTIVITIES : Operation of WTE3, TG12SL2, ISWMC Facilities and LTP

RECEPTORS : Sg. Langat, Bandar Seri Ehsan (3.7km) and Aerofront Development (2.5km).

IMPACTS

Leachate from waste bunker at WTE3 Plant, TG12SL2 landfill and ISWMC components if not treated properly will increase levels of BOD, COD, NH₃-N, Nitrate & Total Phosphorus and resulting in extensive organic pollution at Sg. Langat.

POLLUTION PREVENTION AND MITIGATING MEASURES

Leachate Treatment

- **New LTP expansion** to be added at TG12SL2 .
- To treat the leachate to the EIA modelled level and to the Second Schedule (Regulation 13) of EQ (Control of Pollution from Solid Waste Transfer Station and Landfill) Reg. 2009: Acceptable Conditions for discharge of Leachate before final discharge into the Sg. Langat.



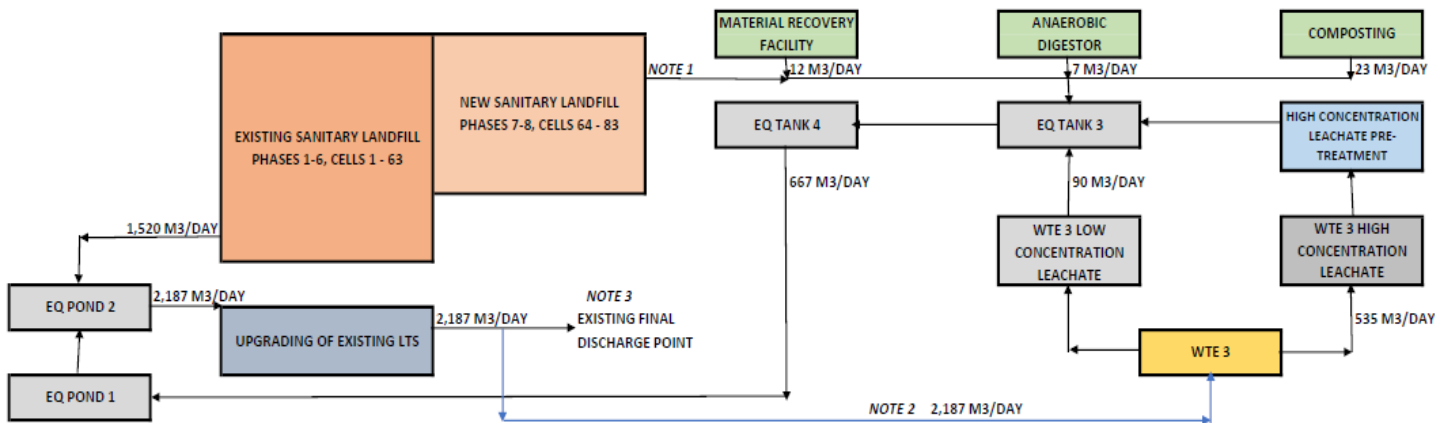
OPERATION PHASE

ACTIVITIES:

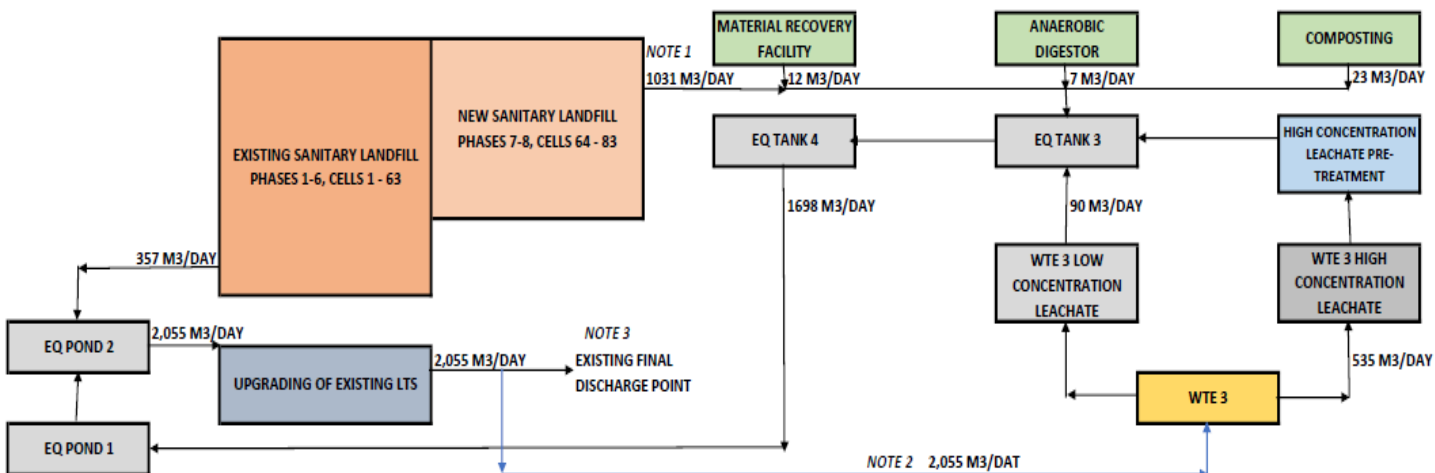
1. The total amount of leachate treated at the LTS is 2,187 m³/day
2. The treated leachate will be recycled and re-use in WTE3 during normal operational condition and there will be no discharge into canal prior discharging into Sg. Langat.

Integrated Leachate Management with Water Reclamation and Re-use for LTP

PHASE 1 - 5 IN OPERATION



Phase 8 in operation
Phase 7 closed
Phase 1 - 6 closed





CONSTRUCTION PHASE

ACTIVITIES : Site Clearing, Earthworks, Construction of Access Road, WTE3 Plant, Tanjung Dua Belas Sanitary Landfill TG12SL2, LTP Expansion and ISWMC Components.

RECEPTORS : Bandar Seri Ehsan (3.7km) and Aerofront Development (2.5km).

IMPACTS



Increased **level of TSP/PM10** due to spillage or wind-blown dust from uncovered material which may have some effects on aesthetic value and health aspects.



Traffic movement on dirt road will churn up the surface and may incite hazy condition especially during dry and windy periods.



Leveling of ground and the use of heavy machinery for the compaction of the fill material during earthwork and construction activities will give rise to dust pollution.

POLLUTION PREVENTION AND MITIGATING MEASURES

- Provision of **wash trough**.
- Constant wetting and cleaning of roads connecting the Site to external public roads.

SPEED



LIMIT

- **Traffic management** through speed limits and regular maintenance of vehicles / machinery.

- To erect **hoarding** along the boundary of the Project Site.

OPERATION PHASE

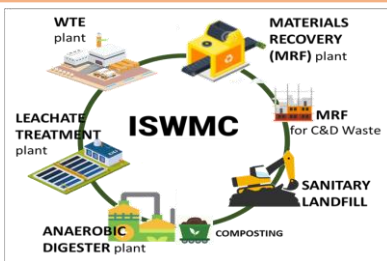
ACTIVITIES : Operation of WTE3, TG12SL2, ISWMC Facilities and LTP

RECEPTORS : Bandar Seri Ehsan (3.7km) and Aerofront Development (2.5km).

IMPACTS



Gas emission from the stacks during the WTE3 operation.

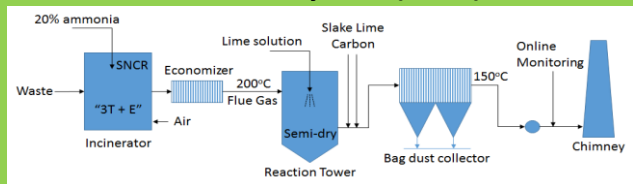


Dust from landfill operation.

Odorous gases generated in the waste pit in WTE3 Plant landfill waste cells at TG12SL2 and ISWMC components.

POLLUTION PREVENTION AND MITIGATING MEASURES

Air Pollution Control System (APCS)



- **Emission** - Comply to EQ (Clean Air) Regs 2014

- **Daily cover** material is introduced at the end of the day of operation at the Landfill.



- The waste pit will be within a **totally enclosed structure**.
- Use of **odour neutralizing** sprays and additives where odours cannot be prevented.



CONSTRUCTION PHASE

ACTIVITIES : Site Clearing, Earthworks, Construction of Access Road, WTE3 Plant, Tanjung Dua Belas Sanitary Landfill TG12SL2, LTP Expansion and ISWMC Components.

RECEPTORS : Bandar Seri Ehsan (3.7km) and Aerofront Development (2.5km).

IMPACTS

Nearest residential receptors shall experience **minimal noise level** emitted from tractors, scrapers, dozers, loaders, graders, excavators and trucks.



POLLUTION PREVENTION AND MITIGATING MEASURES

- Installation of **hoarding** with minimum 1.8m as a noise barrier height or vegetative buffer to reduce noise intrusion to the receptors.
- Noisy construction activities should be done only during day-time to preserve tranquility of night-time.
- Continuous **monitoring** during construction stage.

OPERATION PHASE

ACTIVITIES : Operation of WTE3, TG12SL2, ISWMC Facilities and LTP

RECEPTORS : Bandar Seri Ehsan (3.7km) and Aerofront Development (2.5km).

IMPACTS

WTE3 operation noise generating from air blower, draught fan, air compressor, circulating water pump, steam turbine generator as well as vehicles noise such as rubbish trucks and forklift in Tanjung Dua Belas ISWMC.



POLLUTION PREVENTION AND MITIGATING MEASURES

- Proposed **vegetative buffer** at the site boundary as natural air and noise barrier.
- To periodically **maintain/service** the garbage truck to ensure it is at its optimal operating conditions at all times;
- **Impose speed** limit of 35km/hr for garbage truck going through the village road.





MAIN IMPACTS FOR GROUNDWATER

OPERATION PHASE

ACTIVITIES : WTE3 processes, TG12SL2 and ISWMC components operation.
RECEPTORS : Groundwater aquifer and Sg. Langat.

IMPACTS

Possibilities of **groundwater contamination** of heavy metal during operation due to contact of ashes with water from the WTE3 Plant and also leachate from the TG12SL2.



POLLUTION PREVENTION AND MITIGATING MEASURES

- Proper **handling** of scheduled waste at site.
- A **proper drainage system** should be designed in the project area to stabilize the groundwater system after the construction.
- **Groundwater sampling**, and monitoring within the Project Site in accordance with the requirements of DOE Malaysia.



MAIN IMPACTS FOR ECOLOGY

CONSTRUCTION PHASE

ACTIVITIES : Site Clearing, Earthworks, workers quarters within the Site.

RECEPTORS : Sg. Langat, Aquatic species.

IMPACTS

Loss of secondary forest vegetation and generation of **1,885.84 tons biomass**.

POLLUTION PREVENTION AND MITIGATING MEASURES

- Open burning is **prohibited**.
- The biomass will be disposed off to the existing Tanjung Dua Belas Sanitary Landfill.



OPERATION PHASE

ACTIVITIES : Final discharge of treated Leachate from LTP

RECEPTORS : Sg. Langat, Aquatic species in Sg. Langat

IMPACTS

- Reduce fishes and shrimp within the river due to water quality in Sg. Langat might be affected.
- The proposed WTE3, TG12SL2 and ISWMC components development could possibly affect fishers and aquatic species if polluting activities within the Tanjung Dua Belas Sanitary landfill and WTE3 Plant are not properly mitigated especially leachate leakages.



POLLUTION PREVENTION AND MITIGATING MEASURES

- **Final discharge of the LTP** to Sg. Langat must **comply** with EIA modelled limit and DOE Limit.



CONSTRUCTION PHASE

ACTIVITIES : Site Clearing, Earthworks, Construction of Access Road, WTE3 Plant, Tanjung Dua Belas Sanitary Landfill TG12SL2, LTP Expansion and ISWMC Components.

RECEPTORS : Sg. Langat, Bandar Seri Ehsan (3.7km) and Aerofront Development (2.5km).

IMPACTS



Generation of 1,885.84 tons biomass.

Generation of **construction and demolition waste** from site clearing and construction activities

Generation of scheduled waste from maintenance of machinery at and domestic waste at base camps.

POLLUTION PREVENTION AND MITIGATING MEASURES

- **Biomass dispose** off to the Tanjung Dua Belas Landfill.

- **Reuse & recycle:** segregate waste onsite for recycling at other construction sites, sell valuable resources to recycling facilities
- Unsuitable material to be disposed to TG12SL.

- Scheduled waste to be **managed** in accordance with the EQ (Scheduled Waste) Regulations 2005.
- Domestic waste should be recycled (provision of recycle bins) where possible or disposed at TG12SL.

OPERATION PHASE

ACTIVITIES : Incoming Daily Solid Wastes of 2,400MT.

RECEPTORS : Sg. Langat, Aquatic species in Sg. Langat

IMPACTS

- **Improper disposal** of solid waste may affect aesthetic quality, a source of water contamination and proliferation of disease vectors.

- **Sludge** generation from the Leachate Treatment Plant at TG12SL and WTE3.
- **Fly ash and bottom ash** from waste incinerators.
- **Other SWs** from the maintenance workshop.

POLLUTION PREVENTION AND MITIGATING MEASURES

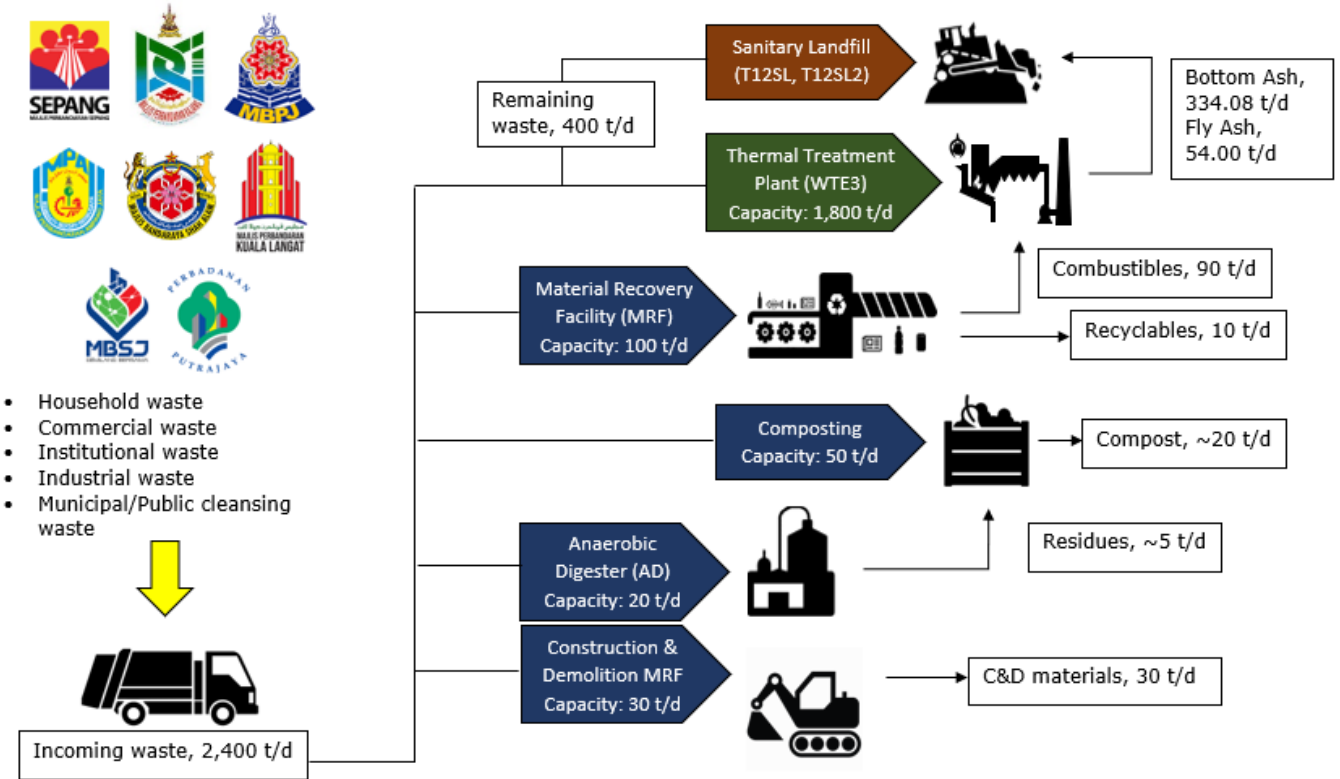
- Provision of a recycling center (MRF & C&D MRF) to encourage recovery of reusable portions of municipal waste such as glass, aluminum, plastics



- **Sludge** from LTP will be disposed of to the landfill.
- **Bottom ash and fly ash** from APCS will be disposed of to landfill, if approved under special management of wastes.
- **Scheduled wastes** to be managed in accordance with the EQ (Scheduled Waste) Regulations 2005.



OPERATION PHASE




No.	Type	Category of Waste	Disposal Method
Leachate Treatment Plant (LTP)			
1.	Sludge (Leachate treatment residue)	SW204	Disposal to Tanjung Dua Belas Sanitary Landfill.
Boilers, SNCR + Bag Filter (Air Pollution Control System)			
2.	Bottom ash	SW104	Disposal to Tanjung Dua Belas Sanitary Landfill*.
3.	Fly ash	SW104	Cement-stabilizer solidification technology for fly ash solidification and disposal to Tanjung Dua Belas Sanitary Landfill*.
Maintenance Workshops			
4.	Spent lubricating oil	SW 305	Disposal to Licensed SW contractor.
5.	Spent hydraulic oil	SW 306	Disposal to Licensed SW contractor.
6.	Rags, plastic, paper or filter contaminated with scheduled wastes.	SW 410	Disposal to Licensed SW contractor.

MAIN IMPACTS FOR SOCIO-ECONOMY ENVIRONMENT

CONSTRUCTION PHASE

RECEPTORS : Bandar Seri Ehsan (3.7km) and Aerofront Development (2.5km) , Estate Workers Plantations, road users of Jalan Langat Lestari.

IMPACTS




Influx of foreign workers causing security and social concerns.



Dust and noise disturbance.

Positive Impacts

- 
- Stimulates economy growth at the national, regional and local levels.
 - Creation of job opportunities.

POLLUTION PREVENTION AND MITIGATING MEASURES


- Provision of **base camps** and centralized labour quarters to minimize interaction with local communities.
- Project proponent to monitor worker activities
- Implementing **good housekeeping** and **best management practices (BMP)**.
- **Prioritizing** locals for employment and business opportunities.

OPERATION PHASE

ACTIVITIES : Sanitary Landfill and WTE Operation

RECEPTORS : Bandar Seri Ehsan (3.7km) and Aerofront Development (2.5km) , Estate Workers Plantations, road users of Jalan Langat Lestari

IMPACTS

- 
- **Increase current status of living** of the local population residing nearby in terms of infrastructures and increase employment opportunities.

- **Residual impacts** from the operation of the TG12SL2, WTE3 plant and ISWMC components, i.e., noise, air emission, odour, LTP effluent discharge.



POLLUTION PREVENTION AND MITIGATING MEASURES

- Implementation of **Social Impact Management Plan** as recommended in the SIA Study.
- Continual engagement and **corporate social responsibility (CSR)** with surrounding communities.



- Final discharge of the LTP to Sg. Langat must **comply** with EIA modelled limit and Second Schedule (Regulation 13) of EQ (Control of Pollution from Solid Waste Transfer Station and Landfill) Reg. 2009: Acceptable Conditions for Discharge of Leachate.
- WTE emission - **compliance** to Environmental Quality (Clean Air) Regulations 2014.



MAIN IMPACTS FOR HEALTH ENVIRONMENT

CONSTRUCTION PHASE

RECEPTORS : Bandar Seri Ehsan (3.7km) and Aerofront Development (2.5km) , Estate Workers, Plantations

IMPACTS



Localized **air pollution** due to suspended particulates or airborne dust.



Dengue fever outbreak

POLLUTION PREVENTION AND MITIGATING MEASURES

- Implementing good housekeeping and best management practices.
- Maintain cleanliness of the construction site and CLQ. Regular fogging whenever necessary to destroy adult mosquitoes.
- Tightly implementation of Standard Operation Procedures (SOP) in the Workplace.

OPERATION PHASE

ACTIVITIES : Landfill and WTEs Operation

RECEPTORS : Bandar Seri Ehsan (3.7km) and Aerofront Development (2.5km) , Estate Workers, Plantations, road users of Jalan Langat Lestari

IMPACTS

- Gases/emission will be emitted from the WTE3 stacks and released into the atmosphere.
- Leachate from the WTE3, TG12SL2 and ISWMC components are expected to contain heavy metals like lead, nickel and mercury, which may find its way into Sungai Langat.



POLLUTION PREVENTION AND MITIGATING MEASURES

- Emission from WTE3 Stacks must comply to Environmental Quality (Clean Air) Regulations 2014.
- Leachate from WTE3, TG12SL2 and ISWMC components will be treated by LTP TG12SL for treatment and to be 100% reused in WTE3 operation and if discharge, it must comply with EIA modelled limit and Second Schedule (Regulation 13) of EQ (Control of Pollution from Solid Waste Transfer Station and Landfill) Reg. 2009: Acceptable Conditions for Discharge of Leachate.



MAIN IMPACTS FOR TRAFFIC

CONSTRUCTION PHASE

RECEPTORS : Bandar Seri Ehsan (3.7km) and Aerofront Development (2.5km) , Estate Workers, Plantations

IMPACTS



Lorries and trucks delivering building materials, aggregate, etc. will increase traffic flow of the area especially at Jalan Langat Lestari

POLLUTION PREVENTION AND MITIGATING MEASURES



Traffic management is necessary to control traffic movements especially during peak hours.

OPERATION PHASE

ACTIVITIES : Incoming daily solid wastes of 2,400MT and WTE Operation

RECEPTORS : Bandar Seri Ehsan (3.7km) and Aerofront Development (2.5km) , Estate Workers Quarters, Plantation, road users of Jalan Langat Lestari

IMPACTS

- Jalan Langat Lestari is expected to receive the **increased traffic** volume from the proposed development.

POLLUTION PREVENTION AND MITIGATING MEASURES

- Designing the facilities on the trucks/vehicles to minimize the likelihood of spillage occurring;
- Scheduling of the transportation trucks to ensure the truck turn-around time is not delayed and to prevent truck-waiting within the site, which will lead to a line-up of truck along the internal road along the Jalan Langat Lestari.
- Strict adherence to the relevant regulations pertaining to road transport.
- ISWMC Waste Flow on **e-World System**.



PROPOSED ENVIRONMENTAL MANAGEMENT PLAN (EMP)

Environmental Management Plan (EMP).

- Monitoring, Reporting & Auditing.

Competent Persons.



- Environmental Officer, Competent person for Industrial Effluent Treatment System (IETS) and the Leachate Treatment Plant (LTP), Air Pollution Control System and CePSWaM.

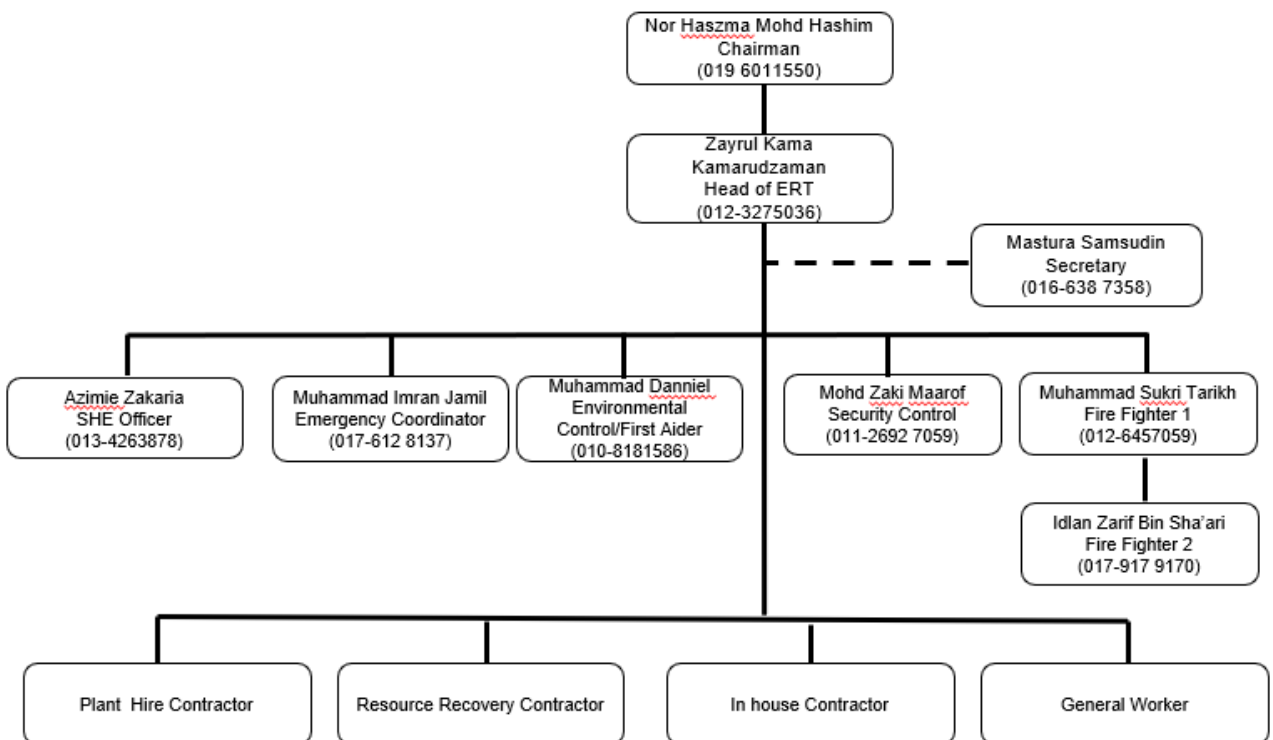
Landfill Closure

- Guideline for Safe Closure and Rehabilitation of MSW Landfill Sites by Ministry of Urban Wellbeing, Housing and Local Government, MUWHLG (2006).

Monitoring for Air Residual Impact - Proposed monitoring of Dioxin/Furan at Workers Quarters/Future Workers Hostel every six month during operation stage.

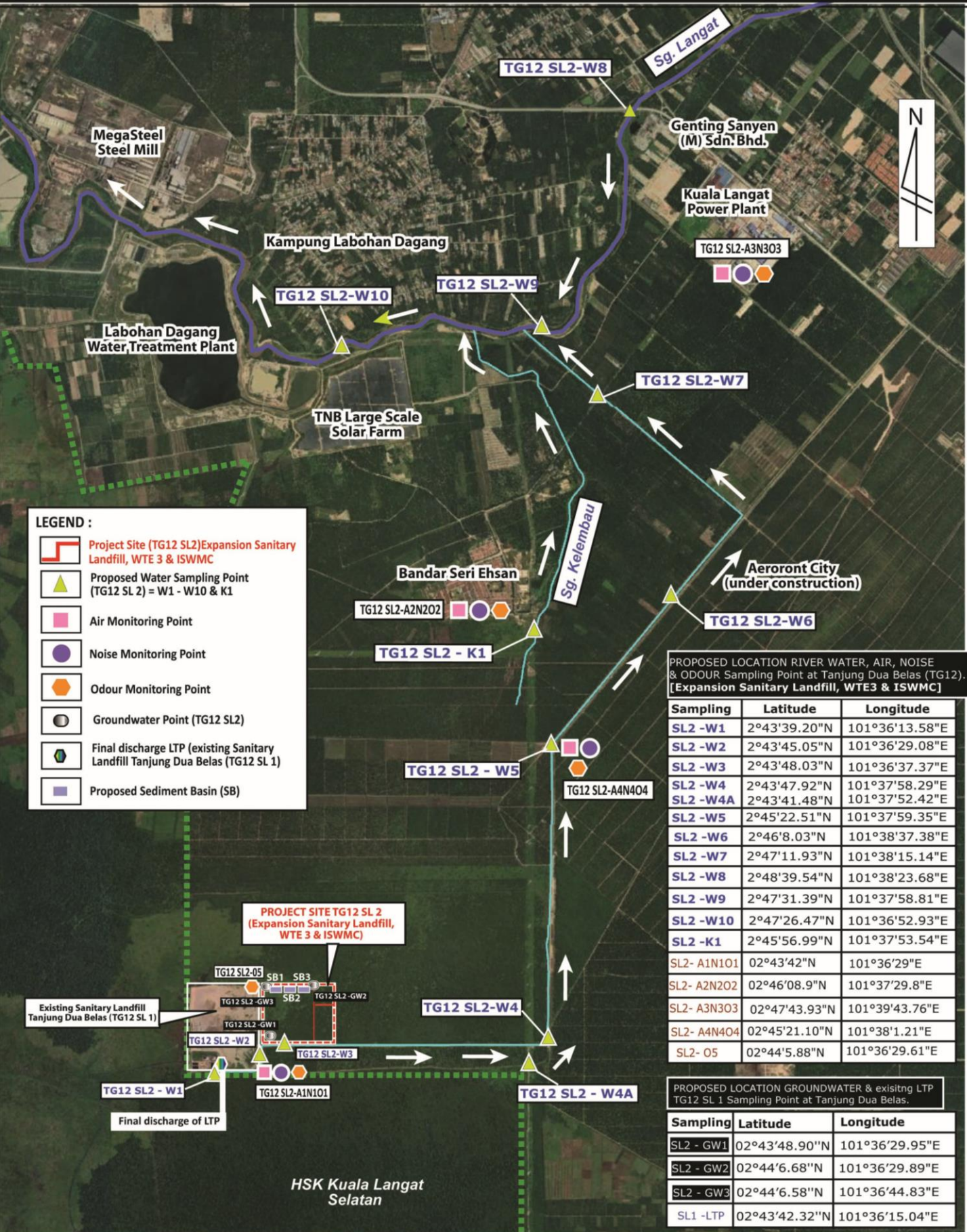


EXISTING ENVIRONMENTAL MANAGEMENT ORGANIZATION AND ERT COMMITTEE



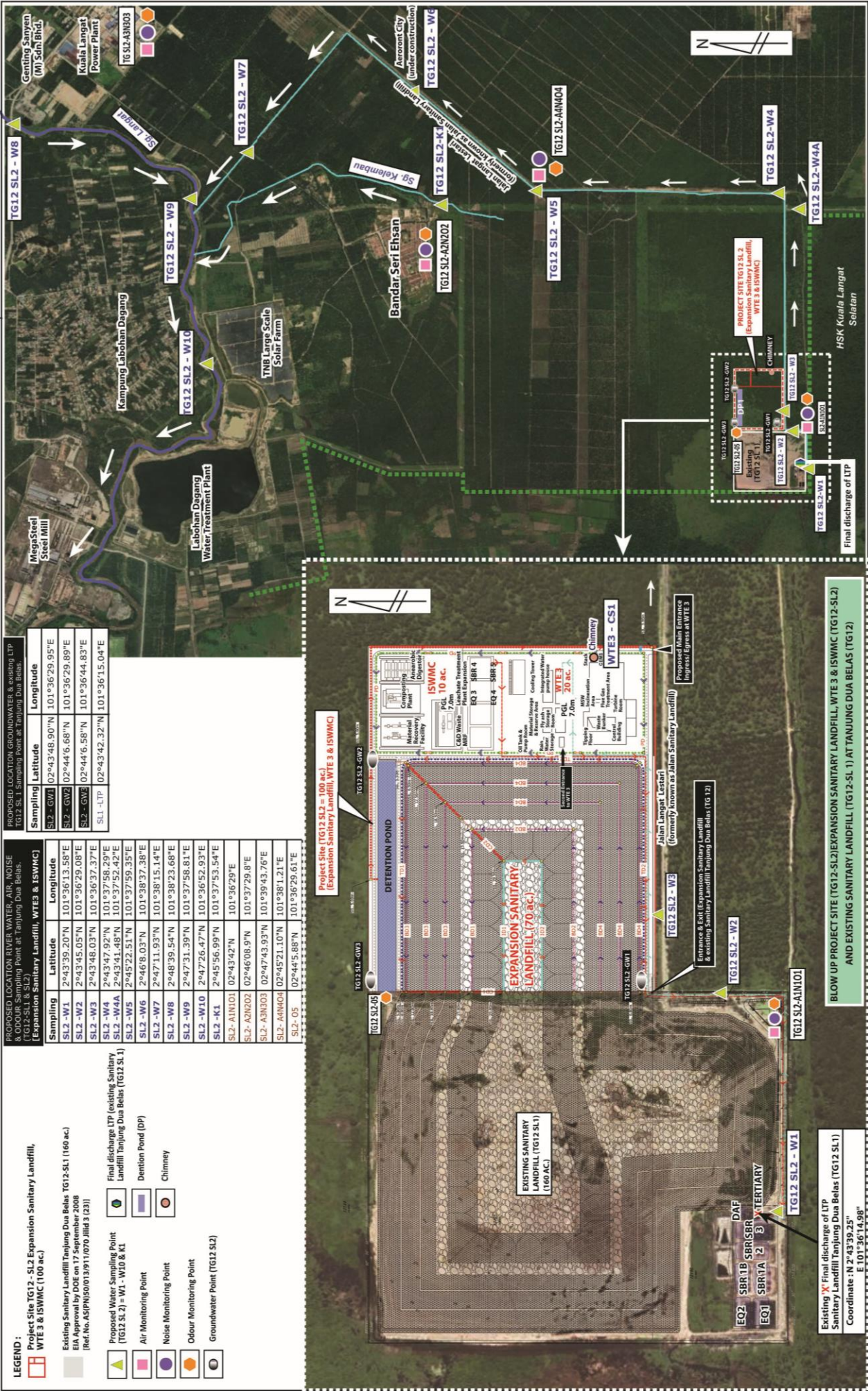
PROPOSED ENVIRONMENTAL MONITORING PROGRAM

CONSTRUCTION PHASE



PROPOSED ENVIRONMENTAL MONITORING PROGRAM

OPERATION PHASE



PROPOSED LOCATION RIVER WATER, AIR, NOISE & ODOUR Sampling Point at Tanjung Dua Belas. (TG12-SL1 & SL2)

Sampling	Latitude	Longitude
SL2 - GW1	02°43'48.90"N	101°36'29.95"E
SL2 - W1	02°43'48.90"N	101°36'29.95"E
SL2 - W2	02°44'16.68"N	101°36'29.89"E
SL2 - W3	02°44'16.68"N	101°36'29.89"E
SL2 - W4	02°44'16.58"N	101°36'44.83"E
SL2 - W5	02°44'16.58"N	101°36'44.83"E
SL1 - LTP	02°43'42.32"N	101°36'15.04"E

PROPOSED LOCATION RIVER WATER, AIR, NOISE & ODOUR Sampling Point at Tanjung Dua Belas. (TG12-SL1 & SL2)

Sampling	Latitude	Longitude
SL2 - W1	2°43'39.20"N	101°36'13.58"E
SL2 - W2	2°43'45.05"N	101°36'29.08"E
SL2 - W3	2°43'48.03"N	101°36'37.37"E
SL2 - W4	2°43'47.92"N	101°37'58.29"E
SL2 - W4A	2°43'41.48"N	101°37'52.42"E
SL2 - W5	2°45'22.51"N	101°37'59.35"E
SL2 - W6	2°46'18.03"N	101°38'37.38"E
SL2 - W7	2°47'11.93"N	101°38'15.14"E
SL2 - W8	2°48'39.54"N	101°38'23.68"E
SL2 - W9	2°47'31.39"N	101°37'58.81"E
SL2 - W10	2°47'26.47"N	101°36'52.93"E
SL2 - W11	2°45'56.99"N	101°37'53.54"E
SL2 - W12	2°45'56.99"N	101°37'53.54"E
SL2 - W13	02°43'42"N	101°36'29"E
SL2 - W14	02°46'08.9"N	101°37'29.8"E
SL2 - W15	02°47'43.93"N	101°39'43.76"E
SL2 - W16	02°45'21.10"N	101°38'1.21"E
SL2 - W17	02°44'5.88"N	101°36'29.61"E

LEGEND :

- Project Site TG12 - SL2 Expansion Sanitary Landfill, WTE 3 & ISWMC (100 ac)
- Existing Sanitary Landfill Tanjung Dua Belas TG12-SL1 (160 ac)
- EIA Approval by DOE on 17 September 2008 (Ref. No. A5/PN/50/013/911/070 Jilid 3 (23))
- Proposed Water Sampling Point (TG12 SL2) = W1 - W10 & K1
- Final discharge LTP (existing Sanitary Landfill) Tanjung Dua Belas (TG12 SL1)
- Detention Pond (DP)
- Chimney
- Air Monitoring Point
- Noise Monitoring Point
- Odour Monitoring Point
- Groundwater Point (TG12 SL2)



1. Water Quality Modelling Findings

Compliance to the Environmental Quality (Control of Pollution from Solid Waste Transfer Station and Landfill) Regulations 2009 at 0.0253 m³/s LTP effluent discharge **did not exhibit obvious impacts** towards the canal (and Sg. Langat) for most modeled parameters.

2. Groundwater Modelling Findings

There are **no indicator** shows the migration of the Arsenic and Cadmium plume horizontally in the entire simulation time of 30 years.

3. Air and Odour Modelling Findings

During Scenario 1 Normal Operation for WTE3, the calculated GLCs for identified criteria air pollutants at the identified off-site ASRs **met** the Malaysian Ambient Air Quality Standards at 2020 and the adopted Ontario's Ambient Air Quality Criteria for all pollutants except for PM2.5 at ASR4.

Occasionally perceive residual odour of less than 7 ou/m³ by modelling at Aerofront City Development (O4).

4. Noise modelling findings

The calculated LAeq noise levels during operation period met the respective recommended limits in the Guidelines for Environmental Noise Limits and Control (Third Edition, 2019 Reprint 2021) at the identified noise sensitive receptor at NSR 1: Bandar Seri Ehsan.

5. Health Impact Assessment Findings

The calculated HQ for exposure to air pollutants at Bandar Seri Ehsan (ASR 2) and Aerofront City Development (ASR 4) were all less than 1, indicating that the non-carcinogenic health effect of the air pollutants were considered as being acceptable.

The predicted heavy metal river water concentrations at the Labohan Dagang Water Treatment Plant intake point on Sg. Langat was assessed for their carcinogenic health effects from ingestion of selected heavy metals in water, under Scenario 1 (Treated Effluent Discharge, Normal Flow). The total LCR of 6.1×10^{-4} is above 10^{-4} , and is therefore deemed as clearly unacceptable. To mitigate it, the advance treatment technologies used in the proposed leachate treatment process and 100% treated effluent reused for WTE3.

6. Quantitative Risk Assessment Findings

The credible scenario consequences assessed does not reach involuntary recipients of industrial risk surrounding the project, which is in compliance with DOE's risk acceptance criteria.

7. Conclusion

The proposed WTE3 Plant, TG12SL2 and ISWMC components development can be carried out within the context of a carefully planned and managed project that will be ultimately beneficial to contribute towards the social acceptability and better solid waste management for the state of Selangor Darul Ehsan.