

## **EXECUTIVE SUMMARY**

### **PROJECT TITLE**

**“Proposed Scheduled Waste Recovery Facility at Lot 38104 (PT 13811), Jalan Industri Galla 12, Mukim Labu, Daerah Seremban, Negeri Sembilan Darul Khusus”**

### **PROJECT PROPONENT**

**Perusahaan Thulam Sdn. Bhd. (1175629-A)**

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Negeri Sembilan Darul Khusus

***Attn.: Mr. Jeyabalan Vadivelu***

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***Attn.: Mr. Kumar Annavoo***

## I. INTRODUCTION

The Proposed Project is an off-site scheduled waste recovery plant will be established at Lot 38104 (PT 13811), Jalan Industri Galla 12, Mukim Labu, Daerah Seremban, Negeri Sembilan. The proposed waste codes are **SW 305, SW 306, SW 322 and SW 323** at a capacity given in Table 1. The Proposed Project is initiated by **Perusahaan Thulam Sdn. Bhd.**

**Table 1: Proposed Waste Codes and Capacity (MT/month)**

<b>Waste Code</b>	<b>Description [as in EQ (Scheduled Waste) Reg. 2005]</b>	<b>Capacity, MT/month</b>
SW 305	Spent lubricating oil	700
SW 306	Spent hydraulic oil	300
SW 322	Waste of non-halogenated organic solvents	130
SW 323	Waste of halogenated organic solvents	130

The Proposed Project Site is geographically located at latitude of 02°44'11.3"N and a longitude of 101°53'45.1"E. The Proposed Site comes under the jurisdiction of Majlis Bandaraya Seremban (MBS).

**Figure 1 : Location of the Proposed Plant**



## **II. CURRENT ENVIRONMENTAL SETTING**

### **A. Physical Environment**

#### ***i) Morphological Features of the Project Site***

The entire industrial area is located on a flat land which is a well-developed industrial area as part of the Kawasan Perindustrian Galla. A nearly level terrain with average elevations characterizes the entire industrial area where the proposed factory lot is located.

#### ***ii) Streamflow Pattern***

The Galla Industrial Park is drained by internal drainage network of the industrial area. The drainage network will discharge the surface runoff at Sg. Kepayang which flows southeasterly direction and joins Sg. Linggi at about 8 km from the Proposed Plant. The Sg. Linggi will flow southerly until final discharge to straits of Melaka. There is a water intake point downstream at Sg. Linggi (i.e., about 25 km downstream of the Proposed Plant).

#### ***iii) Geology and Soil***

Based on the Geological Map of Malaysia which was published by the Geological Survey Department of Malaysia (1985), the geological formation of the Proposed Site and their surrounding area are the intrusive rocks. The intrusive rocks are mainly the acid intrusive (undifferentiated).

Based on the Reconnaissance Soil Map (2002), published by the Agriculture Department, Malaysia, the major soil type found in this area is the Rengam-Jerangau Series. Soils of Rengam Series are developed over a wide range of terrain from undulating and rolling to hilly but because of their close proximity to the Main Range most of them occur on rolling terrain. They are normally developed on medium to coarse grained granite from which they derive their characteristic 'gritty feel' which is due to the presence of angular quartz grains.

**iv) Landuse**

Major portion of the land use within 5 km radius encompass by urban development, plantation and part of reserve forest (fringes of Galla Forest Reserve). The urban associated land use is mainly dominated by housing developments and few industrial areas. Residential areas within 5 km radius are Taman Mutiara Galla, Taman Bukit Galena, Taman Jasper Jaya, Bandar Ainsdale, Taman Tiroi, Taman Permata, Taman Makmur, Kg. Ulu Pelegong, Kg. Dato Mohd Said, Taman Bukit Kepayang, Seremban 2 Hillpark, Taman Templer, Taman AST, Emerald Park Seremban 2, Taman Bukit Berlian, Taman Gembira and Taman Labu Jaya. The industrial area within 5 km radius is Galla Industrial Park. The **nearest residential** area observed, i.e., **houses at Taman Mutiara Galla** is located at about **400 m** from the Proposed Plant.

**v) Water Quality**

Four (4) water samples will be collected to represents baseline water quality of the Project Site and the surrounding area. The description & coordinate of the sampling locations are given in Table 2 below:

**Table 2: Description of the Water Quality Baseline Sampling Points**

<b>Sampling Point</b>	<b>Description</b>	<b>Coordinate</b>
W1	Upstream of Concrete Drain near the Proposed Plant (Along Jalan Industri Galla 12).	02°44'13"N 101°53'45.2"E
W2	Downstream of Concrete Drain near the Proposed Plant (Along Jalan Industri Galla 12).	02°44'0.97"N 101°53'48.8"E
W3	Upstream of Sg. Kepayang	02°44'18.3"N 101°53'47.9"E
W4	Downstream of Sg. Kepayang	02°44'10.7"N 101°53'54"E

The water sample was collected and analyzed by DSM accredited laboratory Safety & Environmental Laboratory Sdn. Bhd. The result was compared with National Water Quality Standard Class IIA. The baseline results show that most of the parameters complied with the recommended limit of National Water Quality Standard (NWQS) Class

IIA except for BOD levels at all four points and COD at W1, W3 and W4. Ammoniacal Nitrogen and TSS also exceeded at W3 and W4. The exceeding levels are most probably due to the industrial activity upstream and downstream of the Proposed Plant. Exceeding level of TSS and ammoniacal nitrogen at W3 and W4 due to some development activities (land clearing at upstream of Sg. Kepayang).

***vi) Air Quality***

Baseline ambient air quality was measured at the boundary of the Project Site and the nearest sensitive receptors. The sampling sites A1 is at the boundary of the Proposed Project Site. Sampling points A2 is at the nearest sensitive receptor Taman Mutiara Galla. The result obtained shows all parameters indicated levels within the Malaysian Ambient Air Quality Standards (MAAQS).

***vii) Noise Quality***

Baseline noise levels were measured (i.e., 24 hours) at the boundary of the Proposed Project Site and at the nearest residential area (sensitive receptor). The sampling sites N1 is at the boundary of the Proposed Project Site. Sampling points N2 is at the nearest sensitive receptor Taman Mutiara Galla. The results recorded that at Point N1 shows the noise level complied with the recommended limit for industrial zone for day time and night time. However, at Point N2 at Taman Mutiara Galla, did not comply with the recommended limit. The noise levels exceeded the recommended limit for day time and night time. This could be due to the movement of traffic near both localities and also some human activities during day and night time.

**B. Biological Environment**

The proposed Project Site which is located within the existing industrial lots of Galla Industrial Park. No significant biological ecosystem exists within the project area. The surrounding empty lots of the industrial area were observed with secondary vegetation dominated by Acacia trees along with some woody plants.

Figure 2 : Aerial View of the Proposed Plant and Surrounding Area



### III. PROJECT DESCRIPTION

The Proposed off-site recovery facility by Perusahaan Thulam Sdn. Bhd. will be established at **Lot 38104 (PT 13811), Jalan Industri Galla 12, Mukim Labu, Daerah Seremban, Negeri Sembilan.**

The Project Proponent [i.e., Perusahaan Thulam Sdn. Bhd.] has proposed to establish a scheduled waste recovery facility which will accept the following waste codes: **SW 305, SW 306, SW 322 and SW 323.** The scheduled waste send to the plant will be handled and accepted in relations to the established waste acceptance criteria by the Proposed Plant. The proposed wastes and capacity given in Table 3 below:

**Table 3: Proposed Waste Codes and Capacity (MT/month)**

<b>Waste Code</b>	<b>Description [as in EQ (Scheduled Waste) Reg. 2005]</b>	<b>Capacity, MT/month</b>
SW 305	Spent lubricating oil	700
SW 306	Spent hydraulic oil	300
SW 322	Waste of non-halogenated organic solvents	130
SW 323	Waste of halogenated organic solvents	130

#### ***Recovery Process***

#### ***Recovery Process of SW 305 and SW 306***

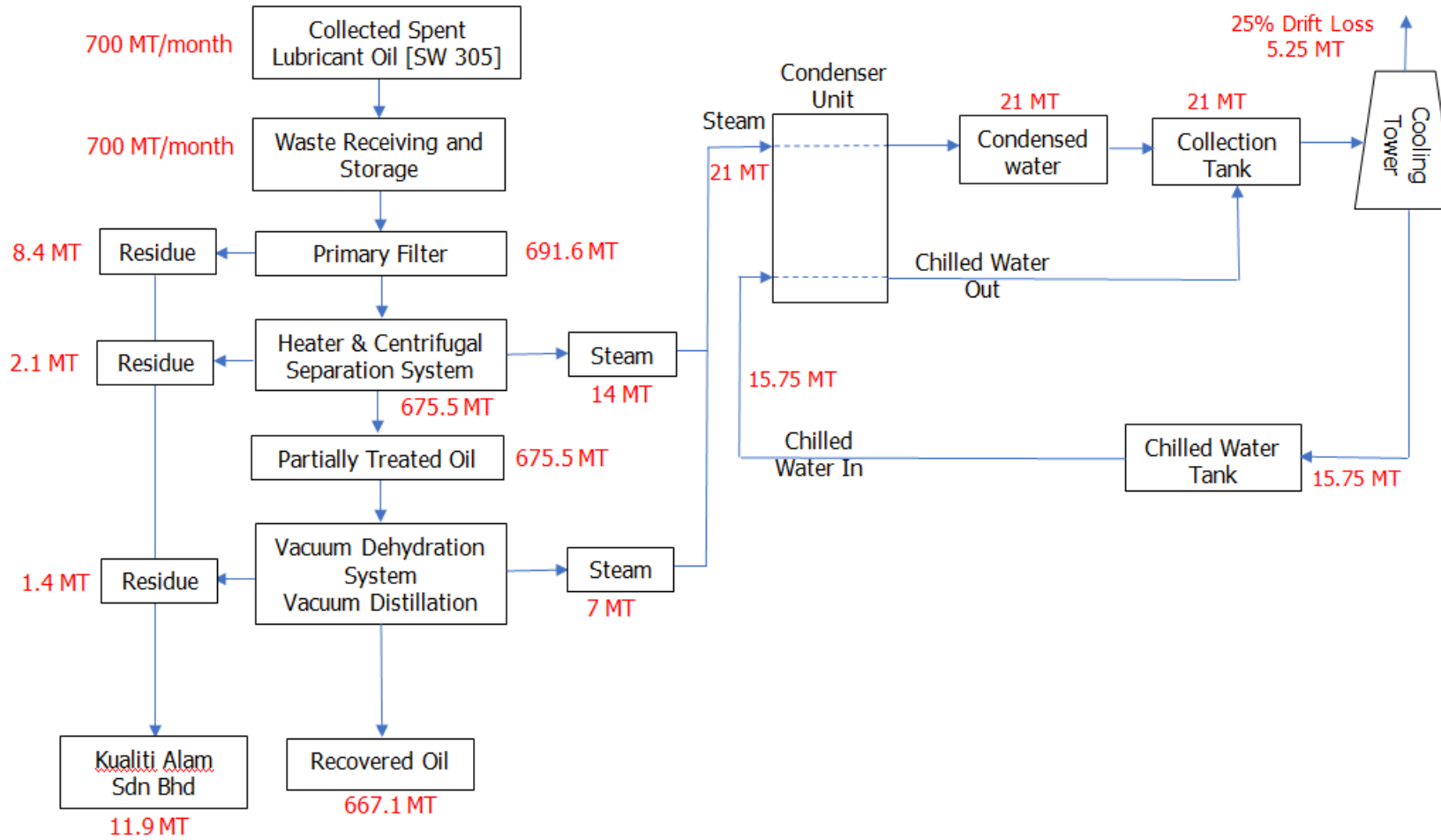
Waste oil will be collected from 2 different types of scheduled wastes: SW 305 (spent lubricating oil) and SW306 (spent hydraulic oil). The amount of SW 305 will be 700 MT/month and SW 306 will be 300 MT/month are expected to be collected. The wastes will be collected from automotive industries, power plants, oil refineries and other oil-based industries. The collected waste oil will undergo oil recovery process using **CYD Centrifugal-Vacuum Oil Purification Machine.** The machine uses integrated centrifugal dehydration method with vacuum dehydration technology. It has high efficiency to remove free liquid water and 80 % of the moisture content. It adopts high polymer material filtration system using German Technology of centrifugal filtration which

eliminate the larger liquid water and large size of particles from the oil. The vacuum dehydration system will eliminate the trace water and tiny particles.

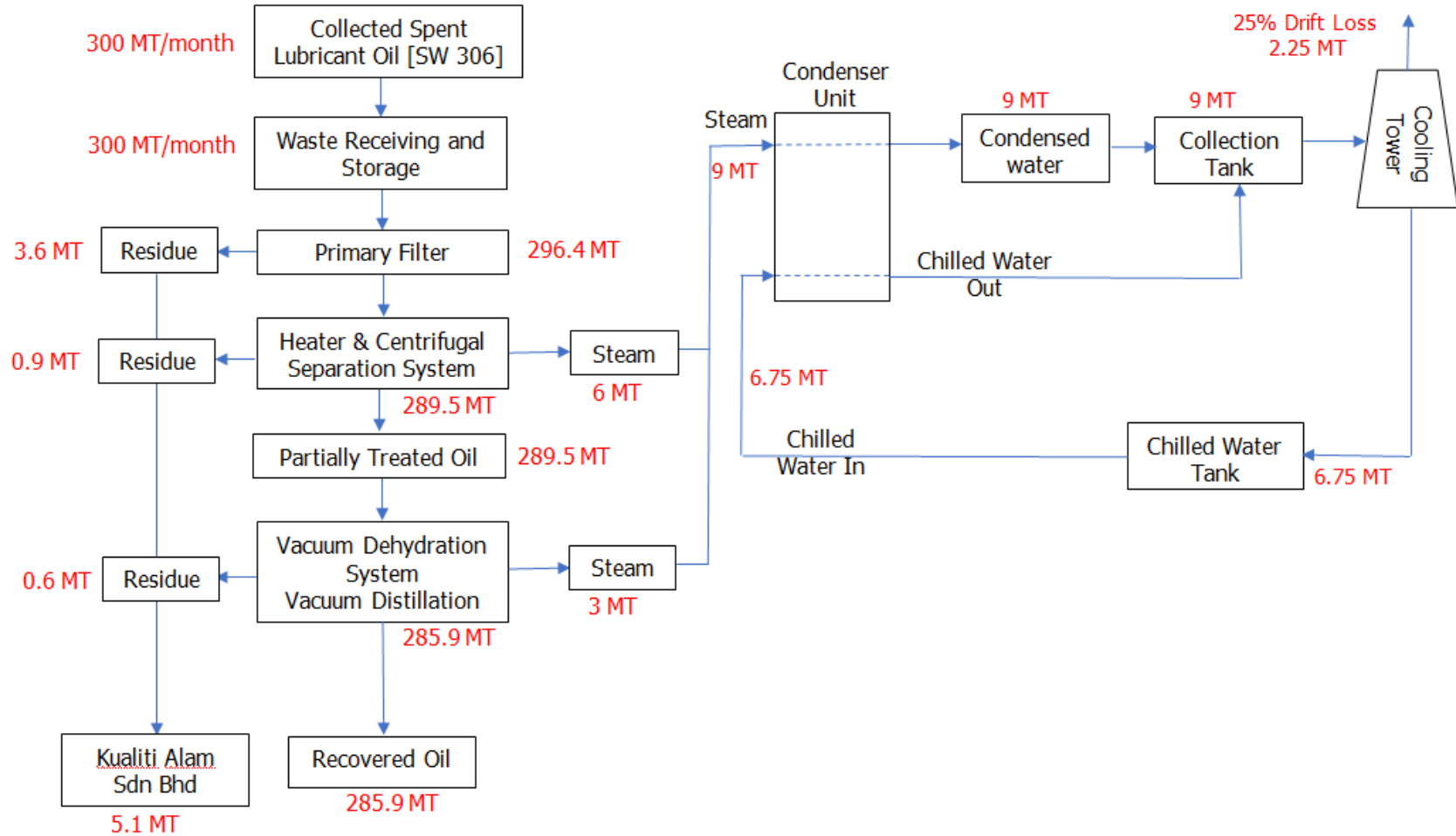
The spent oil will be feed into the purification machine inlet by oil inlet pump. The oil will flow into the primary filter and large size particles will be removed from the oil. After the primary filtration, oil will flow into heater and being heated to 90 - 100 °C. The heated oil will be pumped to the integrated **centrifugal dehydration system** to extract solid (residues) and water from the waste oil. The centrifugal process will settle down the solids and separate the oil and water. Solids (i.e., residues) collected during this process will be labelled as SW 501 and stored temporarily at the residual storage area. The residual waste will be sent to Kualiti Alam Sdn. Bhd., for final disposal. The oil from the centrifugal dehydration system will be pumped to the **vacuum dehydration system** for further purification process. The oil in the vacuum dehydration system will go through vacuum distillation and condensation process to separate the recovered oil, remaining water and solids. The recovered oil which is the final product will be stored in the IBS tanks as finish product.

The water separated from the recovery process (i.e., maximum 21 MT/month and 9 MT/month for SW 305 and SW 306 respectively) will be sent to condenser unit in the form of steam. The steam will be converted to condensed water and stored in collection tank prior to send to cooling towers to generate chilled water for the condenser unit. About 25% of the water will be evaporated hourly at cooling tower as drift loss. **The water separated will be recycled fully within the closed loop system. Hence no discharge will be generated from the proposed recovery process.** The process flowchart and mass balance for SW 305 and SW 306 are given in Figures 3 and 4.

**Figure 3: Process Flow Chart and Mass Balance for SW 305**



**Figure 4: Process Flow Chart and Mass Balance for SW 306**



### ***Recovery Process of SW 322 and SW 323***

Spent solvent will be collected from 2 different types of scheduled wastes: SW 322 (Waste of non-halogenated organic solvents) and SW323 (Waste of halogenated organic solvents). ***A total of 260 MT/month*** (combined capacity) of these scheduled wastes are expected to be collected. The collected waste solvents will undergo recovery process using industrial distillation unit of ***ROTO PLUS Solvent Reclaimer***.

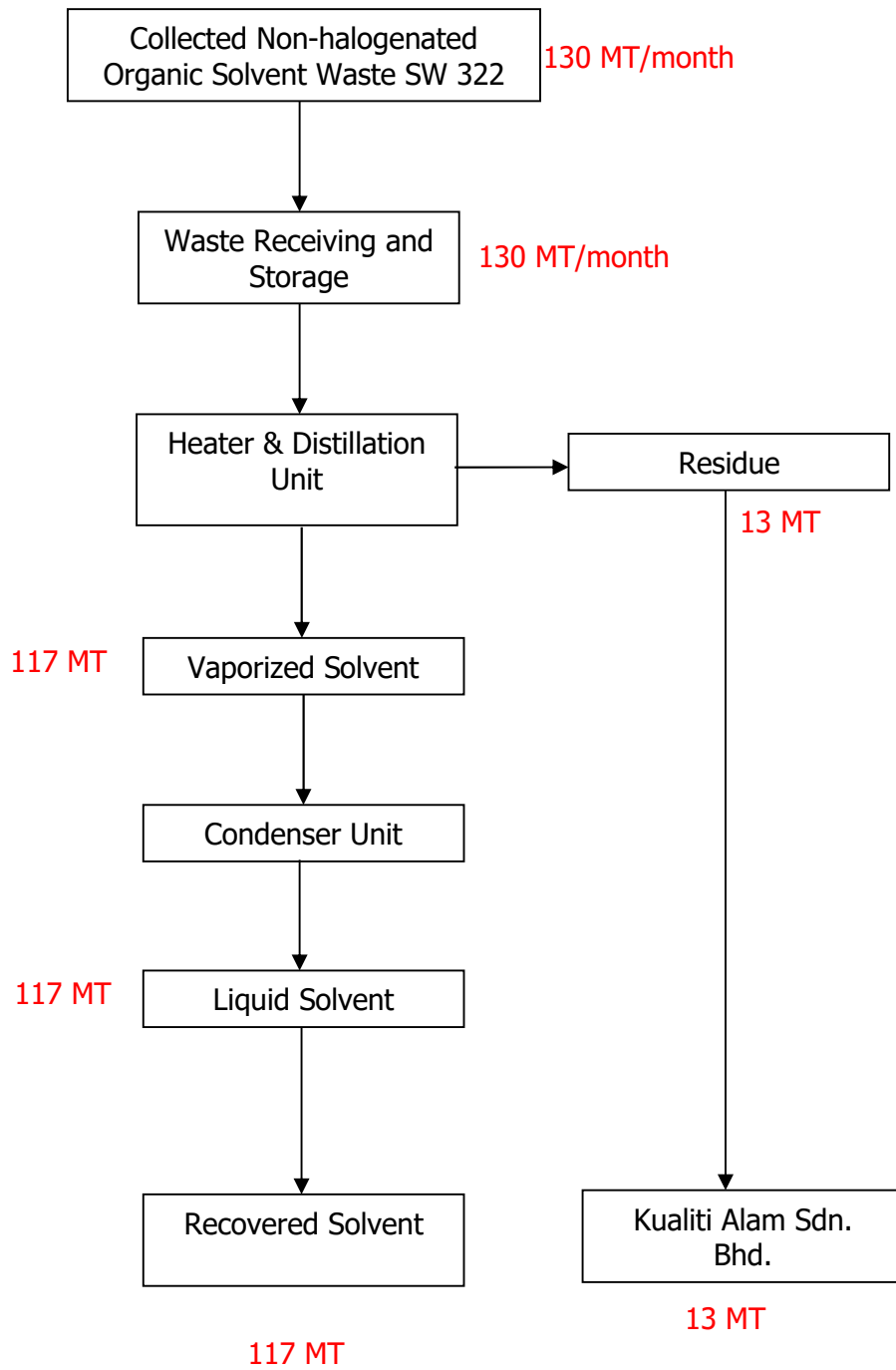
The distillation cycle starts with loading of the waste solvent in the unit tank by external pneumatic pump. The heating process will start, and the heating of diathermic oil found in the heating jacket. When the solvent reaches its boiling point temperature, the vapor produced flow to the upper area of the tank and is thus separated from the contaminants that remain on the bottom.

The solvent vapors are then conveyed to the condenser, where they are brought back to the liquid state and simultaneously cooled down, so that the distilled solvent is collected and stored as final product. During the cycle, the tank content is mixed by the rotor scrapers which keep the heating surface smooth and free from scaling. This allows even highly contaminated solvents to be recovered, reducing the quantity of residues significantly.

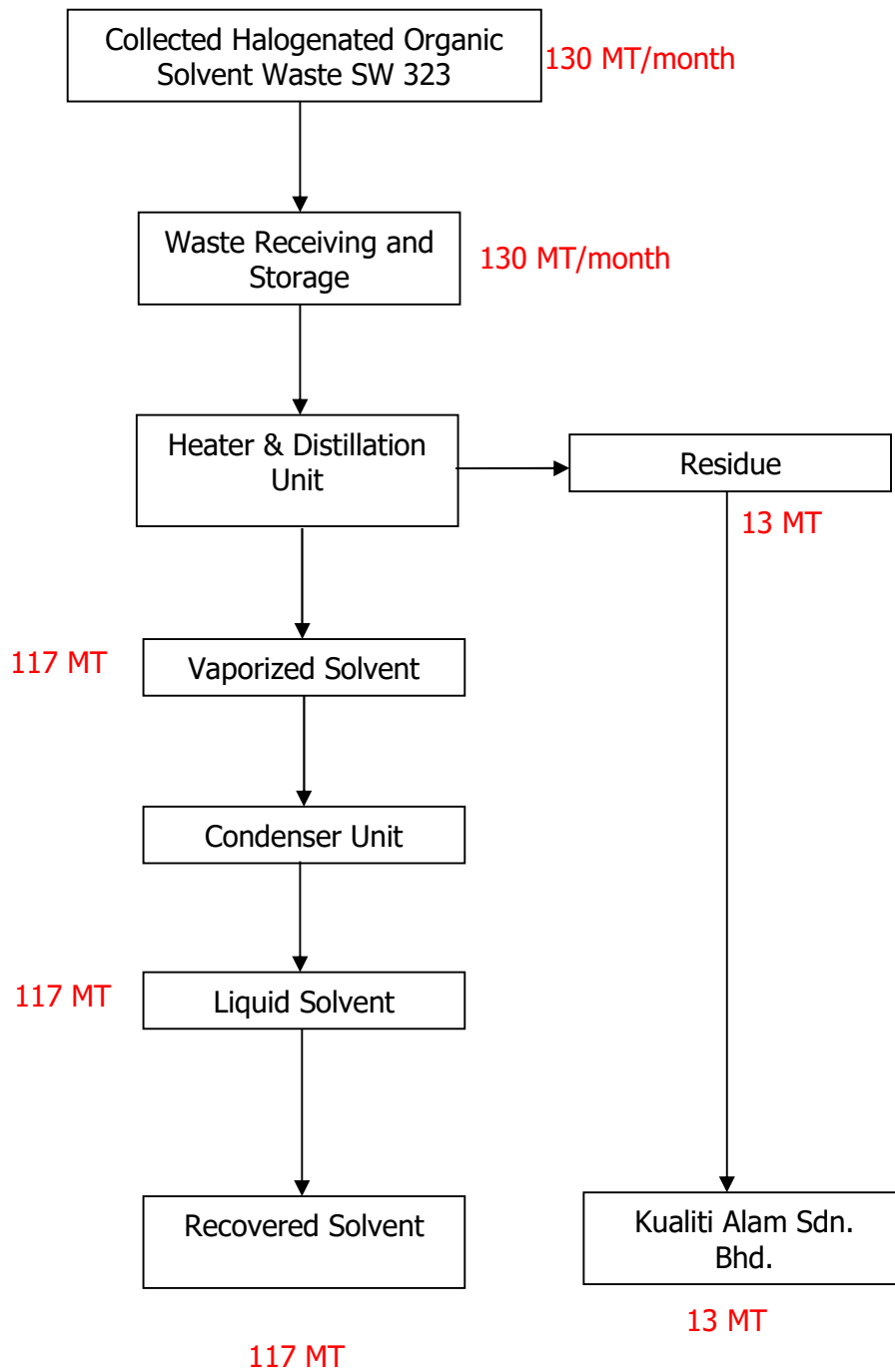
The boiling point of the solvent can be lowered by means of a vacuum unit. This allows to process solvents with high-boiling point (up to 270 °C) as well as substances that are extremely sensitive to heat. It will be a ***closed loop system*** where no emission of fume or VOC will be emitting to atmosphere.

At the end of the cycle, the residue is safely discharged through a 3" ball valve. With the aid of the scraper rotation, the residue is conveyed to the discharge point found at the center of the tank tapered bottom. To prevent clogging of the discharge channel, a special rotating scraper is provided, which helps the compacted residues to flow out. The residue will be collected in metal drums and labelled as SW 501. The residue will be stored at designated residual waste storage area prior to dispose at Kualiti Alam Sdn. Bhd. The process flowchart and mass balance are given in Figures 5 and 6.

**Figure 5: Process Flow Chart and Mass Balance for SW 322**



**Figure 6: Process Flow Chart and Mass Balance for SW 323**



#### **IV. ENVIRONMENTAL CONSIDERATIONS**

The potential impacts of the proposed development generally occur during the implementation of the project and its recommended mitigation measures are tabulated in Table 4. Activities inherent in the pre-construction phase are rather localized and are not expected to generate any significant detrimental impacts.

During the operation and maintenance phase, usage of scheduled wastes as raw material may create adverse impacts to the environment. Therefore, proper measures have been incorporated into the plant to counter these impacts.

#### **V. ENVIRONMENTAL MANAGEMENT PLAN (EMP) FRAMEWORK**

The EMP is proposed as a means to ensure that the proposed mitigation measures are implemented effectively to render the anticipated impacts to acceptable levels.

- On-site management plan during the operational phase would be mainly the service and maintenance scheme for the proposed project;
- Water, ambient air and noise monitoring programs to evaluate the effectiveness of the mitigation measures, which are implemented, to further improve where necessary.
- A framework of Emergency Response Plan (ERP) also attached in Chapter 9.

#### **VI. CONCLUSION**

Under the Environmental Quality (Scheduled Wastes) Regulations 2005, all scheduled wastes must be treated within a prescribed premise. In line with the current on-going efforts to conserve precious natural resources and preserve the environment, recovery facilities that provide environmentally positive solutions and which are also sound economic investments should be encouraged especially in the areas of scheduled wastes management, recovery and disposal. The Proposed Project's operations will not create a significant adverse impact to the neighborhood and environment if the Proponent adheres to all regulatory requirements and complies with the conditions stipulated by the relevant authorities. The proposed facility will be operated in accordance with established and recognized standards.

**Table 4: Summary of Potential Impacts, Their Magnitude and Proposed Pollution Prevention and Mitigation Measures (P2M2)**

<b>Project Activities</b>	<b>Significant Potentially Impacts</b>	<b>P2M2</b>	<b>Ref. Page</b>
<b>A. Pre-Construction Activities</b>			
1. Documentation	<ul style="list-style-type: none"> <li>No significant impacts.</li> </ul>	<ul style="list-style-type: none"> <li>No mitigation measures require.</li> </ul>	7-1 & 8-1
2. Site investigation	<ul style="list-style-type: none"> <li>The establishment of the plant at existing industrial area, no major impacts are expected;</li> <li>Beneficial impacts through employment opportunities for those involve in preparation works.</li> </ul>	<ul style="list-style-type: none"> <li>No mitigation measures require.</li> </ul>	7-1 & 8-1
<b>B. Facility Construction/ Ancillary Works</b>			
1. Transporting construction material and plant equipment.	<ul style="list-style-type: none"> <li>Dust and exhaust emission;</li> <li>Traffic impedance on carrying capacity roads;</li> <li>Accident risk;</li> <li>Noise disturbance.</li> </ul>	<ul style="list-style-type: none"> <li>Covering the transported raw material with canvas sheet;</li> <li>Lorries carrying raw material should be covered with tarpaulin or canvas sheet;</li> <li>Control speed of lorries and erect proper road signs;</li> <li>Good maintenance of vehicles.</li> </ul>	7-2 to 7-3 & 8-1 to 8-2
2. Plant Renovation and Equipment Installation Works.	<ul style="list-style-type: none"> <li>Water quality deterioration, due to possible leakages of oil and grease from site vehicles, machinery and skid/diesel tank.</li> <li>Noise generation due to construction and installation works</li> </ul>	<ul style="list-style-type: none"> <li>Diesel/oil tank should be equipped with <b>concrete bund</b> (i.e., as per <i>Guidelines for Packaging, Labeling and Storage of Scheduled Wastes in Malaysia, 2014</i>);</li> <li>Ensure <b>proper transfer practice</b> from diesel tank to vehicle/machines and vehicle/machines to diesel tank to avoid spillages;</li> <li><b>Mop up operations</b> and contain the spill within the spilled area to avoid contamination of existing waterways.</li> </ul>	7-3 to 7-5 & 8-2 to 8-3

Project Activities	Significant Potentially Impacts	P2M2	Ref. Page
3. Solid waste disposal.	<ul style="list-style-type: none"> <li>• Public health, eyesore and odor;</li> <li>• Disease vector proliferation;</li> <li>• Sanitary problems.</li> </ul>	<ul style="list-style-type: none"> <li>• Provide for adequate solid waste collection and disposal;</li> <li>• Dispose appropriately and routinely to nearest approved dumpsite.</li> </ul>	7-5 to 7-6 & 8-4
<b><i>C. Operation &amp; Maintenance</i></b>			
1. Transport of Scheduled Waste to Plant	<ul style="list-style-type: none"> <li>• Risk : Leakage and spill from transport vehicles or container and risk of accidents and point source pollution discharging into the nearby waterways.</li> <li>• Traffic/Noise/Air Quality: Transit patterns disrupted, noise and congestion created and pedestrian hazards aggravated by heavy trucks transporting raw material and product to/from facility.</li> </ul>	<ul style="list-style-type: none"> <li>• Proper mode of transport with safety features for scheduled waste;</li> <li>• Well trained and experienced drivers;</li> <li>• Restrict delivery times to low traffic hours;</li> <li>• Avoid densely populated areas.</li> <li>• Transportation and handling in accordance with the SDS of the waste.</li> <li>• Maintaining the trucks in good condition. Emphasis on pre-trip checks to identify problems that may lead to accidents.</li> <li>• Establishment of an ERP framework detailing action required in case of accidents leading to spillages.</li> </ul>	7-8 to 7-9 & 8-4

Project Activities	Significant Potentially Impacts	P2M2	Ref. Page
2(i). Recovery Process (Air)	<ul style="list-style-type: none"> <li>• No possible air emission is expected from the proposed recovery process due to the proposed closed loop system.</li> <li>• Possibilities of fugitive VOC generation during the transfer process.</li> </ul>	<ul style="list-style-type: none"> <li>• Processing will be in vacuum circumstance with fully automatic controlling system.</li> <li>• Electricity will be used as heating source for the recovery process of SW 305 and SW 306.</li> <li>• The solvent recovery (i.e., SW 322 and SW 323) also will be carried out within closed loop system.</li> <li>• No direct exposure of solvent will be anticipated.</li> <li>• The process areas where the transfer activity took place will be fully closed to contain the fugitive VOC.</li> <li>• Mobile activated carbon filters will be placed within the process area to absorb any possible fugitive VOC.</li> </ul>	7-9 to 7-10 & 8-5
2(ii). Recovery Process (Water)	<ul style="list-style-type: none"> <li>• No Effluent will be generated from the proposed recovery process of SW 305, SW 306, SW 322 and SW 323.</li> </ul>	<ul style="list-style-type: none"> <li>• The recovery of SW 305, SW 306, SW 322 &amp; SW 323 will not generate any effluent.</li> <li>• The water segregated during recovery process will be cooled down at cooling tower where the chilled water produced will be reused for condenser unit within the purification machine.</li> <li>• It is estimated about 25 % of water vapour will be emit to atmosphere as drift loss at the cooling tower.</li> <li>• Since the recovery process will be carried out in closed loop system, no effluent will be generated.</li> </ul>	7-10 to 7-11 & 8-5

Project Activities	Significant Potentially Impacts	P2M2	Ref. Page
2(iii). Recovery Process (Soil Pollution & Groundwater)	<ul style="list-style-type: none"> <li>• Soil &amp; Groundwater Contamination</li> <li>• The adverse impacts on soil and groundwater resources are considered minimal due to the entire area will be covered with impermeable material mainly concrete.</li> <li>• Areas of potential accidental discharge of scheduled waste (i.e., loading/unloading area, internal drainage system, storage area).</li> </ul>	<ul style="list-style-type: none"> <li>• All primary containment and secondary containment (e.g., bunding) systems will be provided taking into consideration the compatibility of the material with the substances.</li> <li>• The containment wall for residual storage area shall comply with the <i>Guidelines for Packaging, Labeling and Storage of Scheduled Wastes in Malaysia</i>.</li> <li>• Routine and periodic preventive maintenance programs to ensure undesired release from the entire system.</li> </ul>	7-11 to 7-12 & 8-5 to 8-6
2 (iv). Recovery Process (Noise Pollution)	<ul style="list-style-type: none"> <li>• Operational Noise</li> <li>• The principal sources related to equipment include: Motor Driven Pumps, transportation of trucks handling waste and other material to and fro the facility.</li> </ul>	<ul style="list-style-type: none"> <li>• Generally, noise control will be carried out in four (4) ways, i.e., Control at source Control in transmission path Protect the receiver Implement landscaping program</li> </ul>	7-12 to 7-13 & 8-6 to 8-7

Project Activities	Significant Potentially Impacts	P2M2	Ref. Page
3. Scheduled Waste Management	<ul style="list-style-type: none"> <li>• Residual waste, SW 501 will be generated from recovery processes;</li> <li>• Small amount of SW 409 (dirty IBC tanks) and SW 410 (used filters) will be generated.</li> <li>• Improper storage and handling of these scheduled wastes could create danger to the surrounding, workers and groundwater contamination.</li> </ul>	<ul style="list-style-type: none"> <li>• The residual waste, SW 501 will be send to Kualiti Alam Sdn. Bhd for final disposal;</li> <li>• The scheduled waste i.e., SW 409 and SW 410 will be collected and stored in the designated storage area prior to send to DOE licensed recyclers.</li> <li>• Proper scheduled waste storage area will be provided in accordance with the <i>Guidelines for Packaging, Labeling and Storage of Scheduled Wastes in Malaysia</i>.</li> </ul>	7-13 to 7-14 & 8-7 to 8-8
4. Occupational Safety and Health Management	<ul style="list-style-type: none"> <li>• Workers susceptible to various risk during operation and maintenance;</li> <li>• Emergency in case of any accidents.</li> </ul>	<ul style="list-style-type: none"> <li>• Comply to OSH Act 1994 (Act 514) and it's relevant regulations;</li> <li>• Commitment of the Perusahaan Thulam Sdn. Bhd. management towards EHS aspects</li> <li>• Factories and Machineries Act would be adhered to;</li> <li>• Updated safety handbook to enhance work procedures;</li> <li>• Proper signboards serving as administrative control;</li> <li>• ERP (Emergency Response Plan) to counter emergency occurrences during operations;</li> <li>• Training and communication of the above laws and regulations to all relevant personnel.</li> </ul>	7-15 to 7-16 & 8-8 to 8-10