PETRONAS DAGANGAN BERHAD

WASTE MANAGEMENT PROCEDURE

DECEMBER 2017

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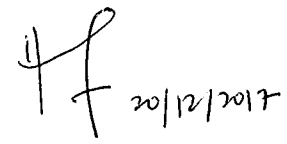
HUSNA FAIRUZ BINTI AHMAD AKBAR Environment Executive, HSE Division, PDB	

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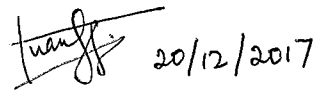
NG TUAN HOOI Staff (Environment), HSE Division, PDB	

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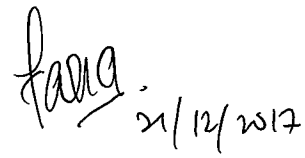
TARIQ ASHRA BIN SULAIMAN Head, HSE Division, PDB	

REVISION HISTORY

Date	Revision	Description of Updates	Author
Feb 2011	00	New- PDB Scheduled Waste Guideline	Nor Hashilah bt Abd Halim
Oct 2017	01	PDB Waste Management Procedure	Husna Fairuz bt Ahmad Akbar Ng Tuan Hooi

TABLE OF CONTENTS

1. PURPOSE

1.1. The purpose of these Procedures is to describe a consistent approach in the management of wastes for PDB that meets PETRONAS and regulatory requirements, and other international standards of good practices. Specific requirements are covered in the PETRONAS HSE Standard *18.00.02 HSE Mandatory Control Framework (MCF)* under Sub-element *3.4 Hazardous Waste Management*, PETRONAS Technical Standard *PTS 18.72.01 Waste Management* and PETRONAS Downstream requirements per *DBE-02.03-L2-654 Hazardous Waste Management*.

2. SCOPE AND APPLICATIONS

2.1. These procedures apply to waste generated at PDB sites or facilities as follows:

PDB Facilities/Sites	Scope of Application
PDB-operated facilities and Joint Venture facilities under PDB's operational control, such as most of PDB's Terminals (Fuel, LPG and Aviation)	These Procedures apply.
Fuel and LPG terminals under Joint Venture, in which is under the operational control of JV Company (not under PDB's operational control)	These Procedures do not apply. However, PDB shall exercise influence to JV Companies on environmental commitments as reflected in PDB's HSE Policy.
All Company Owned and Dealer Operated (CODO) PETRONAS Stations, including NGV Stations, and other similar facilities whereby: • Asset owned and maintained by PDB • Station operated by Dealer	These Procedures apply only for those waste generated from clean-up of spills resulting from integrity failure of assets (storage tanks and piping). These Procedures do not apply to waste generated from station/Mesra shop operations. PDB shall exercise governance and influence to Dealers through provisions in the respective Dealership (or any other applicable) Agreements. Dealers are expected to comply with the relevant procedures and guidelines such as Retail HSE Manual etc.
Other facilities and operations that are not under PDB Operational Control • Contractors and suppliers • Customers (Commercial and Household) • LPG Premier Dealers and Dealers • All Dealer Owned and Dealer Operated (DODO) PETRONAS Stations	These Procedures do not apply. However, PDB shall exercise influence to JV Companies on environmental commitments as reflected in PDB's HSE Policy.

2.2. For PDB's International Subsidiaries, the waste shall be managed in compliance with the host country's regulatory requirements, and in accordance to these procedures.

2.3. **Exceptions:** These procedures do not apply to:

a) Aqueous / wastewater discharges to the environment

b) Air emissions to the atmosphere; and

c) Sewage.

3. OVERALL RESPONSIBLE PARTIES

3.1. Roles and responsibilities in implementing these Procedures are as follows:

Party	Responsibilities
Terminal Manager/ Superintendent	i. Ensure full implementation of these Procedures and compliance to regulatory requirements. ii. Ensure competency requirements are met per procedure 7.1 – 7.2.
Certified Scheduled Waste Management Competent Person (CePSWaM)	i. Responsible for overall scheduled waste management according to these Procedures and regulatory requirement. May delegate certain functions to trained staff in the day-to-day handling of scheduled waste. ii. Conduct studies, prepare and submit reports, plans, proposals, engineering drawings or other documents relating to scheduled waste matters to regulatory authorities; iii. Collaborate with HSE Division in provide information to establish PDB Waste Management Plan. iv. Ensure staff involved in handling of hazardous waste is trained. v. Ensure competency requirements are met per Procedures 7.1 – 7.2. vi. Conduct Tier 1 Audit using Tier 1 checklist provided in Appendix H.
Terminal Operations Technicians	i. Conduct handling of scheduled waste according to these Procedures per direction of CePSWaM and Terminal Manager/Superintendent. ii. Ensure competency requirements are met per Procedure 7.2.
Divisions within PDB (e.g. through Territory Managers, HSE Focal, contract owners etc.)	i. Ensure that sites under operational control comply to the requirements of EM and these Procedures; ii. Communicate to all relevant stakeholders (eg. dealers, business partners, contractors, suppliers etc.), on waste management commitments and their responsibilities to those commitments as reflected in HSE Policy.
Other facilities and operations that are not under PDB Operational Control (JV sites not under PDB Operational control, Dealers, contractors, suppliers, customers)	i. Collaborate with PDB and ensure adherence to the intent of environmental and waste commitment as reflected in PDB HSE Policy, comply with regulatory requirements, and HSE provisions in contractual or other agreements with PDB.
HSE Division (Environment, Capability, Performance, Assurance)	i. Exercise governance role and provide advice for the management of waste at PDB facilities/sites. ii. Conduct performance monitoring & reporting and data analysis of key performance indicators of waste per Procedures 6.1. iii. Review work procedure/manual (from other departments in PDB) related to waste management and incorporate appropriate input from Environment TP/SME.

4. GENERAL PROCEDURES

4.1. Wastes generated shall be managed by each site/facility in accordance to workflow outlined in **Procedure Flowchart** which covers the following processes:

- Waste identification and sources of waste generation;
- Waste inventory;
- Waste handling, segregation and storage;
- Offsite waste transportation, storage, treatment, recovery/recycling and/or disposal;
- Reporting.

4.2. Waste listed in the First Schedule of the Malaysian *Environmental Quality (Scheduled Wastes) Regulations 2005* is classified as scheduled waste. Examples of scheduled waste typically generated by PDB's operations are included in **Appendix A**.

4.3. For PDB's International Subsidiaries, hazardous waste shall be identified and managed in compliance with the host country's regulatory requirements.

4.4. Wastes that do not have hazardous characteristic and not listed under First Schedule, are by default classified as non-hazardous waste. Examples of non-hazardous waste include used paper, food waste and containers, plastic bottles, uncontaminated used packaging materials (eg. boxes and plastic containers).

5. WASTE MANAGEMENT/MINIMIZATION PLAN

5.1. CePSWaM shall provide information to and collaborate with PDB HSE Division to provide information to establish PDB Waste Management Plan. The purpose of the waste management plan is to determine the adequacy and effectiveness of waste management practices, as well as treatment and disposal capability and technology options.

5.1.1. Management of waste for newly planned or existing facilities shall consider, in the following descending order of preference:

i. Remove – the elimination waste at source;
ii. Source Reduction – the generation of less waste through more efficient practices;
iii. Reuse – the use of materials or products that are reusable in their original form;
iv. Recycle – the conversion of wastes into usable materials;
v. Recovery - the extraction of energy or material from wastes;
vi. Treatment – the destruction, detoxification and/or neutralization of residue through processes; and
vii. Responsible disposal – Deposition of wastes on land or in water using methods appropriate for a given situation.

5.2. When developing the Waste Management Plan as provided in **Appendix G**, opportunities for waste minimization, such as reduction or elimination of waste, volume or toxicity, recycling and reclaiming, and/or treatment/disposal, should be evaluated. When a potential waste minimisation practice is identified, a pilot exercise may be conducted for evaluation.

5.3. If a waste minimization opportunity exists whether at site level or corporate level, a Waste Minimisation Plan shall be developed per **Appendix G** with clear targets, with approval obtained from PDB management. The plan should be reviewed annually.

5.4. **Exclusions:** Waste Management and Minimization Plan is not required for sites not operated by PDB.

6. REPORTING AND DOCUMENTATION

6.1. PERFORMANCE

6.1.1. CePSWaM and/or Terminal Superintendent shall report the following on KPI to existing reporting platform (e.g. SDD Online) on a monthly basis.

- Quantity of hazardous waste generated (kg or tonnes);
- Quantity of hazardous waste disposed (kg or tonnes); and
- Quantity of hazardous waste recovered (kg or tonnes).

6.1.2. HSE Division (HSE Performance) to compile, review and verify accuracy of quantity hazardous waste reported in Procedure 6.1.1 and to report these to Group HSE in accordance to *PTS 18.06.04 HSE Performance Monitoring and Reporting* on quarterly basis.

6.1.3. Other performance measurements for hazardous waste to be monitored, tracked and reported, where applicable:

- Total number of hazardous waste management non-compliance;
- Percentage of reduction of waste generated (actual vs. plan);
- Cost reduction for waste disposal (actual vs. plan); and
- Progress of waste minimisation program (actual vs. plan).

6.1.4. HSE Division (Environment) to conduct analysis and report on the KPI for hazardous waste (per Procedures 6.1.2 and 6.1.3) and incorporate the information in PDB Waste Management Plan and/or Waste Minimisation Plan.

6.1.5. **Exclusions:** KPI Performance reporting related to waste for PDB and/or PETRONAS, as mentioned in Procedures 6.1.1 – 6.1.4, is currently not required for sites not operated by PDB. However, these Procedures apply only for those waste generated from clean-up of spills resulting from integrity failure of assets (storage tanks and piping).

6.2. RECORDS MANAGEMENT

6.2.1. CePSWaM and/or Terminal Superintendent shall maintain records related to waste management at their respective sites, where applicable, as follows:

- Site-specific Waste Management/Minimization Plan and related documents;
- Relevant permits, licenses or approvals from regulatory authorities;
- Site procedure/work instructions on waste management;
- Site-specific hazardous waste inventory;
- Site-specific hazardous waste information or waste card;
- Hazardous Waste Consignment Notes/Manifests;
- Tier 1 Assurance reports and progress of closure of gaps on hazardous wastes management;
- Site-specific hazardous waste KPI reports; and/or
- Correspondences with and/or reports submitted to regulatory authorities.

6.2.2. HSE Division shall maintain records related to waste management at Corporate level, where applicable, as follows:

- PDB-wide Waste Management/Minimization Plan and related documents;
- Summary inventory of permits, licenses or approvals from regulatory authorities of all PDB facilities;
- Tier 2 and Tier 3 Assurance reports and progress of closure of gaps on hazardous wastes management;
- PDB-wide hazardous waste KPI reports; and/or
- Key correspondences with and/or reports submitted to regulatory authorities.

6.2.3. Records and documentations to be kept for a minimum of 5 years per HSEMS requirement and Consignment Notes to be kept for a minimum of 3 years per Environment Quality (Scheduled Waste) Regulations 2005, unless specified otherwise by local regulations.

6.2.4. **Exclusions:** For sites not operated by PDB, Procedures 6.2.1 – 6.2.3 do not apply. All records shall be kept and managed according to the provisions of prevailing laws. Although not required to be submitted to PDB and/or PETRONAS, these records shall be made available upon request by PDB and/or PETRONAS, or regulatory authorities (eg. during inspection and audits).

7. COMPETENCY

7.1. COMPETENT PERSON

7.1.1. Per requirement of Section 49A, Environmental Quality Act 1974, the owner/occupier of premise shall employ a person who has been certified by Director-General of Environment as competent person in the management of scheduled waste (CePSWaM). The CePSWaM may delegate certain functions to trained staff in the day-to-day handling of scheduled waste. However, the CePSWaM remains accountable for the overall scheduled waste management at the site.

7.1.2. For small or remote sites with low quantities of generation of scheduled waste generated, a proxy arrangement of scheduled waste competent person may be considered subject to approval by local regulatory authority.

7.2. STAFF TRAINING

7.2.1. Staff involved in identification, handling, labelling, transportation, storage, disposal and waste spillage response of hazardous waste shall attend training prior to commencement of undertaking the tasks and attend refresher training yearly.

7.2.2. HSE Division (Capability) shall establish training requirement for all staff involved in the task above and incorporated into PDB's Training Matrix and training records to be kept in accordance to the PDB's records management. This Procedure does not apply to sites not operated by PDB.

7.2.3. Training on hazardous waste management shall be conducted by TP (Environment), SME or CePSWaM. For sites not operated by PDB, the respective dealers shall ensure that they are trained on waste arrangement (eg. through HSE training programs for dealers).

8. ASSURANCE

8.1. Tier 1 Audit on hazardous waste shall be conducted by CePSWaM on the hazardous waste management on a quarterly basis, using the checklist as per **Appendix H.**

8.2. Results of Tier 1 Audit shall be analysed, monitored and tracked by CePSWaM and to be submitted to HSE Division (Assurance) on a quarterly basis for tracking of closure and analysis.

8.3. For sites not operated by PDB, Tier 1 Audit shall be conducted according to the prescribed mechanism and checklists per *PDB HSE Assurance Procedure*.

9. BIBLIOGRAPHY

In this Procedure, reference is directly or indirectly made to the following Standards/**P**ublications**.** Unless specifically designated by date, the latest edition of each publication shall be used, together with any supplements/revisions thereto:

STANDARDS AND PTS

- PETRONAS HSE Standard 18.00.01 HSE Management System Standard, March 2014.
- PETRONAS HSE Standard 18.00.02 Health, Safety & Environment Mandatory Control Framework, Element 3.4 Hazardous Waste Management, Rev. 2.0, September 2016.
- PETRONAS Technical Standards PTS 18.72.01 Waste Management, December 2014.
- PETRONAS Downstream Operational Excellence Management System (OEMS) DBE-02.03-L2-654 Hazardous Waste Management
- PETRONAS Records Management Policy and Guidelines, Enterprise Information Management, PETRONAS, 2014.

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ACTS/LEGISLATIONS/REGULATIONS

- Environmental Quality Act 1974, Regulations, Rules, Orders, and their amendments, July 2014.
- Environmental Quality (Scheduled Wastes) Regulations, 2005

GUIDELINES

- Guidelines for Packaging, Labelling and Storage of Scheduled Waste in Malaysia, Department of Environment Malaysia, January 2014.

WORK PROCEDURES/MANUAL

- Operating Procedures 040 Handling of Waste Oil or Oily Sludge Disposal (Aviation), July 2013.
- Operating Procedures 063 Scheduled Waste Management (LPG), June 2015.
- Operating procedures 089 Scheduled Waste Management (Fuel), June 2015.
- Operating procedure 175 Scheduled Waste Management (Aviation), June 2015.
- Operating Procedures 164 Waste Transfer from Oil Interceptor (Aviation), August 2013.
- Manual Kesihatan, Keselamatan Dan Alam Sekitar Stesen PETRONAS, July 2013.

10. GLOSSARY OF TERMS

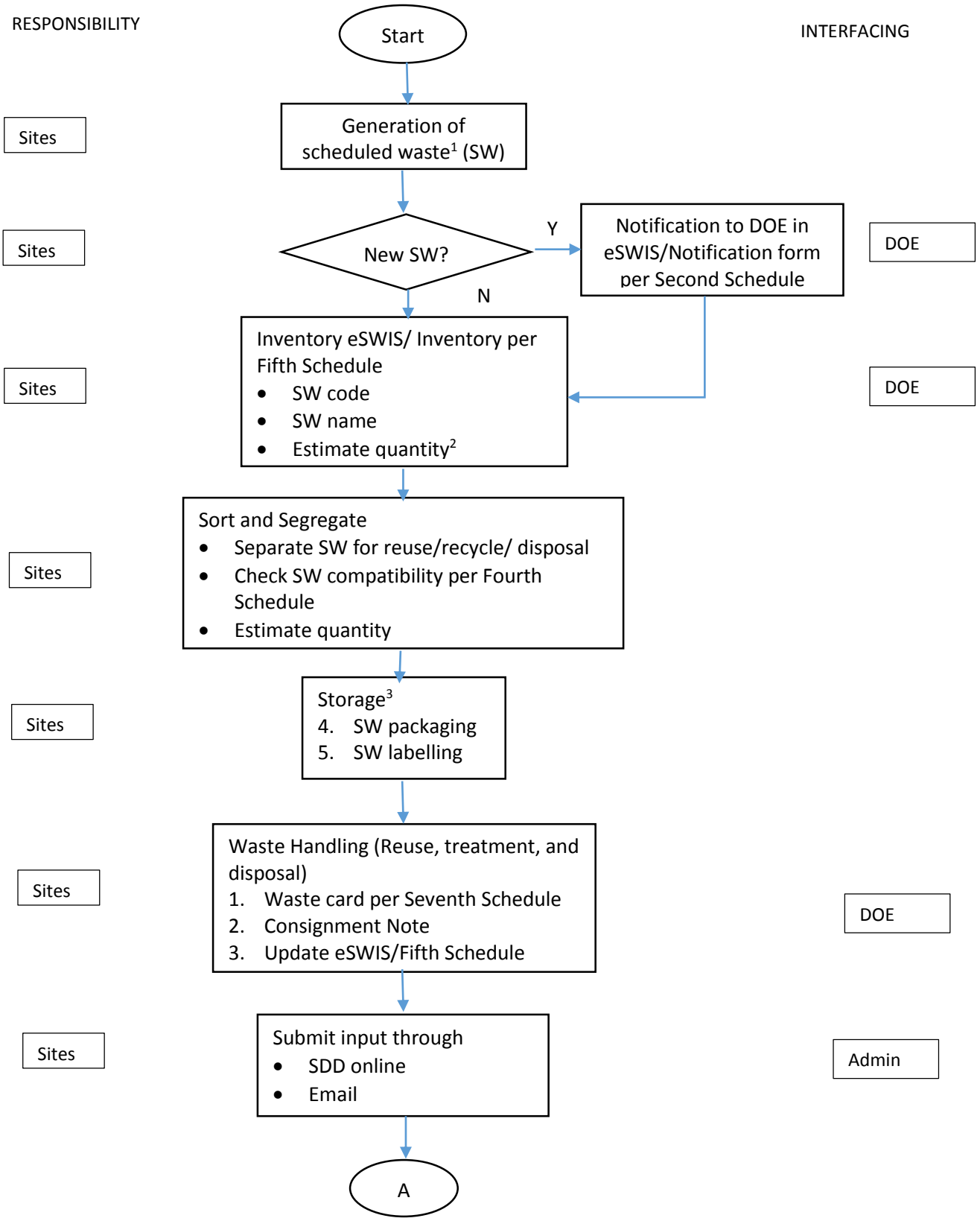
10.1. Definition of Terms in this Procedure

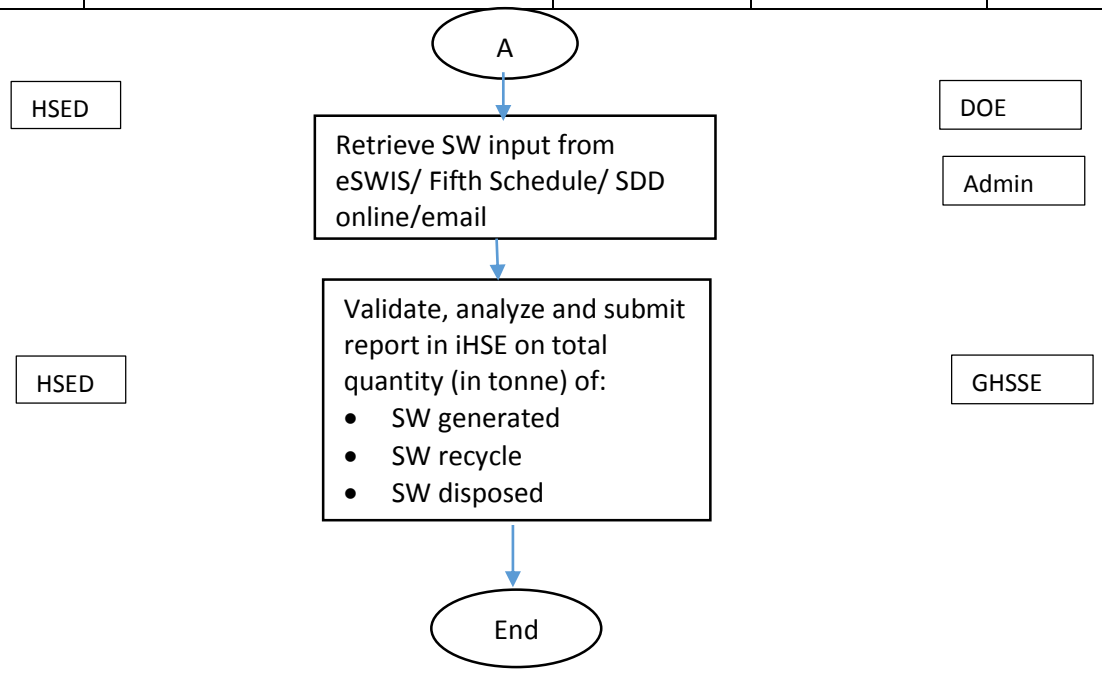
Terms	Definitions
Hazardous Waste	Hazardous waste is any gaseous, liquid or solid waste, if not properly managed, which because of its quantity, physical, chemical or infectious biological characteristics can result in hazards to human health or the environment.
Non-Hazardous Waste	Waste which do not fall within hazardous waste classification are by default classified as non-hazardous waste.
Prescribed premises	Premises prescribed by the *Environmental Quality (Prescribed Premises) (Scheduled Wastes Treatment and Disposal Facilities) Order 1989*[1].
Scheduled Waste	Any waste failing within categories of waste listed in First Schedule of *Environment Quality (Scheduled Waste) Regulations 2005*. All Scheduled Wastes are considered as hazardous waste.
Special Management of Scheduled Waste	Exclusion of scheduled waste generated from particular process or facility from being treated, disposed or recovered by prescribed premises or on-site facilities or recovery facilities per *Environment Quality (Scheduled Waste) Regulations 2005*
Waste	Any substance, whether or not that substance can be reduced, reused, recycled and recovered: • that is surplus, unwanted, rejected, discarded, abandoned, • obsolete, expired or disposed of; • which the generator has no further use of; • that must be treated or disposed of; or • that is identified as a waste by the authority, Exceptions are: • a by-product is not considered waste unless the except a by-product has no value to the producer or any other parties known; and Any portion of waste, once re-used, recycled or recovered, ceases to be waste.
Waste card	Document that contains scheduled waste information per Seventh Schedule of *Environment Quality (Scheduled Waste) Regulations 2005* in respect of each category of scheduled waste.
Waste Container	A portable storage vessel, not permanently connected to process, used to accumulate and/or package waste.
Waste Generator	The unit or person generating waste.

- Specific Abbreviations

No.	Abbreviation	Definitions
1.	CePSWaM	Certified Competent Person of Scheduled Waste Management
2.	CHSE	Corporate Health, Safety and Environment
3.	DOE	Department of Environment, Malaysia
4.	EQA	Environment Quality Act, 1974
5.	eSWIS	Electronic Scheduled Waste Information System
6.	PPE	Personal Protective Equipment
7.	PDB	PETRONAS Dagangan Berhad
8.	TP	Technical Professional
9.	SME	Subject Matter Expert

PROCEDURE FLOWCHART





Legend:

1. Determine the waste is classified under scheduled waste per EQ(Scheduled Waste)Regulation 2005-First Schedule
2. Estimate Scheduled Waste Quantity per Table A-1
3. Storage RULES:
   - Use appropriate container
   - Total quantity NOT MORE THAN 20 MT (approx. 20 drums) at one time
   - NOT MORE THAN 6 months from first date SW generated
   - DO NOT ALTER labelling

Table A-1 : Estimation table for generated scheduled waste

Waste Code	**Waste Description**	Estimated weight for **one (1) full** drum	Estimated weight in MT for **half-full** drum
SW 103	Waste of batteries containing cadmium and nickel or mercury or lithium	0.18 MT	0.09 MT
SW 110	Waste from electrical and electronic assemblies containing components such as accumulators, mercury-switches, glass from cathode-ray tubes and other activated glass or polychlorinated biphenyl-capacitors, or contaminated with cadmium, mercury, lead, nickel, chromium, copper, lithium, silver, manganese, or polychlorinated biphenyl.	0.06 MT	0.03 MT
SW 204	Sludge containing one or several metals including chromium, copper, nickel, zinc, lead, cadmium, aluminum, tin, vanadium and beryllium	0.18 MT	0.09 MT
SW 301	spent organics acids with pH less or equal to 2 which are corrosive or hazardous	0.29 MT	0.145 MT
SW 305	Spent lubricating oil	0.2 MT	0.1 MT
SW 309	Oil-water mixture such as ballast water	0.17 MT	0.085 MT
SW 310	Sludge from mineral oil storage tank	0.21 MT	0.105 MT
SW 311	Waste of oil or oily sludge	0.19 MT	0.095 MT
SW 312	Oily residue from automotive workshop, service station oil or grease interceptor	0.22 MT	0.11 MT
SW 408	Contaminated soil, debris or matter resulting from cleaning-up of a spill of chemical, mineral oil or scheduled waste	0.25 MT	0.125 MT
SW 409	Disposed container, bags or equipment contaminated with chemicals, pesticides, mineral oil or scheduled wastes	0.08 MT	0.04 MT
SW 410	Rags, plastics, papers or filters contaminated scheduled wastes	0.14 MT	0.07 MT
SW 411	Spent activated carbon	0.16 MT	0.08 MT
SW 417	Waste of inks, paints, pigments, lacquer, dye or varnish	0.14 MT	0.07 MT
SW 422	A mixture of scheduled and non-scheduled waste	0.2 MT	0.1 MT
SW 427	Mineral sludge including calcium hydroxide sludge, phosphating sludge and carbonate sludge	0.12 MT	0.06 MT
SW 429	Chemicals that are discarded or off-specification	0.21 MT	0.105 MT

APPENDIX A: Examples of Common or Potential Waste Generated at PDB Facilities

A1. Hazardous / Scheduled Waste

The labels provided in the table below are examples only for typical wastes generated at PDB facilities. Each facility should determine the specific characteristic of each waste for classification and labelling. For further details, please refer to: *Kod Amalan BT: Penggunaan Label dan Bekas Penstoran Buangan Terjadual, First Edition (DOE Malaysia, 25 May 2015)*

Waste Code	Waste Description (per Scheduled Waste Regulations 2005)	Examples of Waste	Example Labels
SW102	Waste of lead acid batteries in whole or crushed form	Lead-acid batteries	
SW103	Waste of batteries containing cadmium and nickel or mercury or lithium	Lithium batteries and other used batteries containing mercury, nickel or cadmium	
SW110	Waste from electrical and electronic assemblies containing components such as accumulators, mercury-switches, glass from cathode-ray tubes and other activated glass or polychlorinated biphenyl-capacitors, or contaminated with cadmium, mercury, lead, nickel, chromium, copper, lithium, silver, manganese, or polychlorinated biphenyl.	Used fluorescent tubes/bulbs, computers, transformers etc	
SW204	Sludges containing one or several metals including chromium, copper, nickel, zinc, lead, cadmium, aluminium, tin, vanadium and beryllium	Sludge from Industrial Effluent Treatment System – *LPG Terminal only*	
SW305	Spent lubricating oil	Spent oil or grease used for lubricating industrial machines, lube sealing compound	
SW306	Spent hydraulic oil	Used hydraulic oil	
SW309	Oil-water mixture such as ballast water	Oily water mixture from oil spill response, oily water mixture from tank draining/cleaning operations or pipeline maintenance activities	

Waste Code	Waste Description (per Scheduled Waste Regulations 2005)	Examples of Waste	Example Labels
SW310	Sludge from mineral oil storage tank	Sludge from oil storage tank draining/cleaning operations	
SW311	Waste of oil or oily sludge	Sludge from tank or oil interceptor cleaning	
		(if in combination with liquid)	
SW312	Oily residue from automotive workshop, service station oil or grease interceptor	Oily sludge or residue from oil interceptor or oil separator	
		(if in combination with liquid)	
SW 315	Tar of tarry residue from oil refinery or petrochemical plant	Solid bitumen	
SW408	Contaminated soil, debris or matter resulting from cleaning-up of a spill of chemical, mineral oil or scheduled waste	Typically soil, debris or matter contaminated with oil. *If other than mineral oil, refer to CSDS and use appropriate labels.*	
SW409	Disposed container, bags or equipment contaminated with chemicals, pesticides, mineral oil or scheduled wastes	Typically used drums, tanks and other container storage contaminated with mineral oil. *If other than mineral oil, refer to CSDS and use appropriate labels.*	
SW410	Rags, plastics, papers or filters contaminated scheduled wastes	Typically rags, plastics, papers or filters contaminated with mineral oil. *If other than mineral oil, refer to CSDS and use appropriate labels.*	

Waste Code	Waste Description (per Scheduled Waste Regulations 2005)	Examples of Waste	Example Labels
SW411	Spent activated carbon	Spent activated carbon. Eg. *facilities with vapour recovery unit utilizing carbon adsorption technology*	
SW417	Waste of inks, paints, pigments, lacquer, dye or varnish	Ink, paint, varnish waste	
SW418	Discarded or off-specification inks, paints, pigments, lacquer, dye or varnish containing organic solvents	Discarded or off-spec inks, paints, varnish containing organic solvents	
SW421	A mixture of scheduled waste	A mixture of scheduled waste	
SW422	A mixture of scheduled and non-scheduled waste	A mixture of scheduled and non-scheduled waste	
SW429	Chemicals that are discarded or off-specification	Chemicals discarded from laboratory	

A2. Non-Hazardous / Non-Scheduled Waste

Waste Type	Examples of Waste
Packaging material	• Used drums or containers (plastic, metal or glass) • Bags, carton, boxes • Pallets • Styrofoam * All above must **not** be contaminated with chemicals, pesticides, mineral oil or scheduled wastes (not classified as SW409)
Scrap	• Rags, plastics, papers or filters that is **not** contaminated scheduled wastes (not classified as SW410) • Soil, debris or matter **not** contaminated with chemical, mineral oil or scheduled waste (not classified as SW408)

Waste Type	Examples of Waste
Domestic / Office	• Food waste/kitchen waste • Paper waste • Plastic waste (drinking bottles) • Wood waste • Glass waste • Metal waste (aluminium cans)

Note: Non-hazardous waste / non-scheduled waste containers shall also be labelled appropriately to distinguish these from hazardous/scheduled waste.

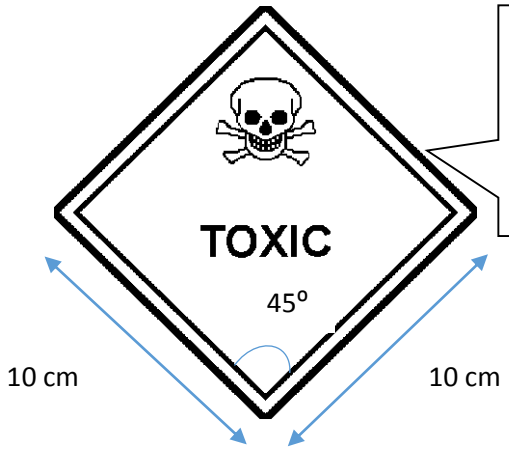
APPENDIX B: Scheduled Waste Packaging Guide

Suitability of packaging based on size of scheduled waste	
Waste Size	**Packaging**
Bulk Liquid wastes	• Storage tanks • Demountable container • Skids
Small volume of waste	• Drums (metal or non-metal) • Big bags/ jumbo bags • Carton boxes • Carboys
Suitability of containers based on type of waste	
Types of waste	**Packaging**
Waste oil and solvents	• Drums (steel or plastic (HDPE)) – sealable bung hole • Intermediate bulk containers (IBC) • Jerrycan/carboys * *Do not use steel containers if corrosive/oxidizing chemicals*
Solid or semi-solid waste (wet sludge)	• Drums (steel or plastic (HDPE)) – clamp lids • Intermediate bulk containers (IBC) • Jerrycan/carboys * *Do not use steel containers if corrosive/oxidizing chemicals*
Solid (dry– no free-flow liquid, dry sludge)	• Drums (steel or plastic (HDPE)), • Intermediate bulk containers (IBC), • Jumbo bag

Additional references:

- *Kod Amalan BT: Penggunaan Label dan Bekas Penstoran Buangan Terjadual, First Edition (DOE Malaysia, 25 May 2015)*
- *Guidelines for Packaging, Labelling and Storage of Scheduled Waste in Malaysia (DOE, 2014)*
- *Guidelines for Nonrigid Scheduled Wastes Containers – Packaging and Labelling (DOE, 2011)*

APPENDIX C: Required Information for Hazardous Waste Label



TOXIC SUBSTANCE

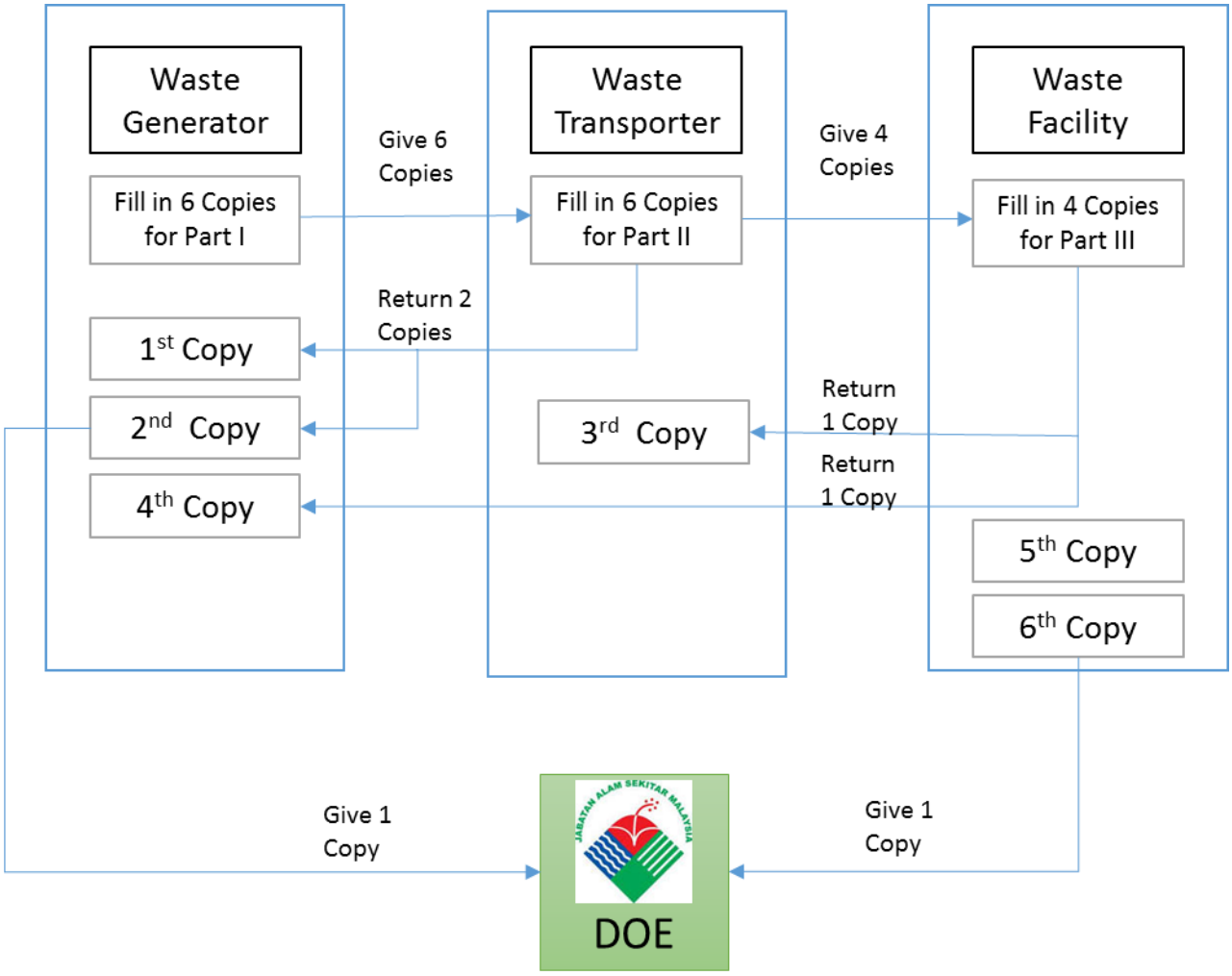
(WASTE)

WASTE CODE	
WASTE NAME	
DATE GENERATED	
WASTE GENERATOR	
ADDRESS	
TEL. NO.	

Additional references:

- *Kod Amalan BT: Penggunaan Label dan Bekas Penstoran Buangan Terjadual, First Edition (DOE Malaysia, 25 May 2015)*
- *Guidelines for Packaging, Labelling and Storage of Scheduled Waste in Malaysia (DOE, 2014)*

APPENDIX D: Consignment Note System (Manual Tracking)



APPENDIX E: Example Waste Card for Hazardous Waste (Seventh Schedule)

A. PROPERTIES			
1. Waste Name			
2. Category of Waste (based on First Schedule)		SW Code	
3. Waste Origin *(process/activities/ unit process)*			
4. Hazardous Ingredients	☐ Analysis ☐ Process Knowleddge		

Component/Constituents	CAS No.	Wt%	PEL

5. Physical Properties		
	Close Cup Flashpoint (°C)	
	Boiling Point (°C)	
	Specific Density (H_2O=1)	
	Viscosity	
	Physical State (gas, liquid, sludge, solid)	
	Color	
	Vapors lighter / heavier than air	
	Waste lighter/ heavier than water	
	Consistency at room temperature (gas, liquid, sludge, solid)	
	Solubility in water at room temperature	
6. Risk	By inhalation, oral intake or dermal contact	
7. Health Hazard Identification	☐ Irritant ☐ Dermal Sensitizer ☐ Acute toxicity (harmful) ☐ Narcotic Effects ☐ Respiratory Tract Irritation	

B. Handling of Waste	
1. Personal Protection Equipment	
2. Procedures/precautions in handling, packaging, transporting and storage	
3. Appropriate Label	

4. Recommended Method of Disposal	
C. Precaution involving Personal Injury	
1. In case of Inhalation of Fumes or Oral Intake; a. Symptoms of Intoxication b. Appropriate First Aid c. Guidelines for the physician	
2. In case of Dermal Contact or Contact with eyes; a. Symptoms of Intoxication b. Appropriate First Aid c. Guidelines for the physician d. Steps to be taken in Case of Spill or Leak	
D. Steps to be taken in Case of Spill or Leak Causing Material Damage	
1. Spill on Floor, Soil, Road, etc.	
2. Spill into water	
3. Fire	
4. Explosion	

APPENDIX F: Summary of Guideline of Storage for Scheduled Wastes

Storage Area Criteria	
On site storage	a) Designated area in Waste Generator premises. b) Located on a flat and away from heat sources and processing area. c) MOC shall be initiated by Area Owner for Temporary Storage in case of spillage (unexpected high volume of wastes generated)
Storage Design Criteria	
Capacity	a) Providing 25% extra storage capacity of the actual maximum amount of waste generated (total max 20 metric tonne) at one time. b) Duration for storage not more than 180 days.
Infrastructure	a) Storage area should be roofed/covered to protect from rain and sunlight. b) For PS, storage area is isolated from public. c) Floor of the storage area and loading and unloading area must be covered with concrete or any suitable lining material, free of cracks and gaps. d) Adequate emergency escape route and forklift movement(if required)
Containment and drainage	a) Storage area to be surrounded with concrete dike to contain spillage with 110% capacity of the largest container stored on-site. b) Dike area properly graded to a sump. c) Provide collection pit or sump and valve to ease the collection work.
Storage Operation	
Container Management	a) Wastes to be packed into container near or at the waste generation point. b) Used waste container shall only be reused for waste. c) Damaged containers (leak, bulging, rusted, dented) shall be disposed and shall not be reused. d) Container shall be closed at all-time except during filling, sampled or emptied. e) All containers to be placed on pallet with vertical position: a. Drums: 4 drums per pallet. b. IBC tank: 1 tank per pallet.
Safety and Security	a) Appropriate PPE is required during waste handling. b) Storage area shall have signage “DANGER” and “SCHEDULED WASTE STORAGE”. c) Storage is equipped with adequate firefighting equipment, spill kit, eye wash and emergency shower.
Temporary Storage	
Temporary storage of hazardous waste at transit location within plant/process area prior transfer to designated	Under special circumstances (e.g. turnaround activities, tank cleaning activities), storage at transit location shall meet following conditions: • Hazard sign and transit storage signage to be made available. • Drums must be labelled, closed and sealed. No waste in non-waterproof container.

storage area shall be avoided.	• Drums shall be placed with secondary containment (lining, bund, drip pan, etc.) to prevent spillage or leakage of hazardous waste into the environment • To transfer to designated storage area or sent to treatment/disposal within 3 days (72 hours).

Further details in:

- *Guidelines for Packaging, Labelling and Storage of Scheduled Waste in Malaysia (DOE 2014)*

APPENDIX G: Example Waste Management Plan

Waste Name	Classification Hazardous/Non-Hazardous	Source	Estimated quantity Generated Annually	Frequency of Generation[1]	Waste Management		
					Estimated quantity	Method[2]	Location[3]

Note(s)

1. Frequency: annually, ad-hoc or routine (daily, weekly or monthly)
2. Waste Management methods includes: Reduction, Reuse, Recycling, Recovery, Treatment or disposal
3. Location refers to on-site or off-site. If off-site, include the name of the off-site facility

Waste Minimization Plan

The plan shall include as minimum:

- Waste Stream Assessments
- Ranking/Prioritizing Waste Streams
- Identify, Evaluate, and Select Options
- Set Waste Stream Minimization Targets
- Implement Selected Waste Minimization Option
- Measure Results and Evaluate Progress
- Establish Review Cycle

APPENDIX H: Tier 1 Audit Checklist for Scheduled Waste

PETRONAS	**Facility:** **Area:**	**Auditor:** **Date:**

1.	Personnel involved in hazardous waste handling/management	Name(s)	
		Position(s)	
		Latest training date:	
2.	PPE is provided during hazardous waste handling	*Please specify:*	

**** Please fill in "✓" if yes, "X" if no, or N/A if not-applicable***

3.	**Storage Area**	**Status***	**Remarks/Comments**
	Roofed, or covered with suitable material (for outside storage)		
	Concrete paved (observation of cracks/gaps) with adequate secondary containment (i.e. > 110% of largest container/drum/tank)		
	Storage area is fenced and kept secured		
	Draining system in function (e.g. not clogged)		
	Area is well ventilated		
	Housekeeping at storage area is good, with adequate space remaining for access to containers/drums.		
	Storage area is not located close to process area or any ignition source		
	Fire extinguisher or firefighting equipment available.		
	Spill kit available (e.g. absorbent pads, booms)		
	Total quantity hazardous waste stored on site is less than 20 MT.		Quantity (kg or tonnes):

	Date of oldest waste stored on site is less than 180 days.		Date of the oldest waste:
	"STORAGE WASTE AREA" and "DANGER" signage available on-site?		
4.	**Container Management**	**Status***	**Remarks/Comments**
	Are all containers closed/secured?		
	Is the waste container in good condition (e.g. observe if there are sign of leaks, bulging, rusted or severe dents observed).		
	Is the waste stored in the container suitable with the type of hazardous waste (e.g. liquid, solid, sludge)		
	How are drums stacked? Indicate number of stacking at storage area (drums/IBC on pallet).		Horizontal / vertical
5.	**Labelling**	**Status***	**Remarks/Comments**
	Are all labels printed clearly and attached on each container?		
	Are all waste containers labelled according to the contents?		
	Are information clearly fill up for each label (e.g. date generated, waste name and waste code)		
	Are empty used drums also provided with labels?		
6.	**Inventory and movement tracking**	**Status***	**Remarks/Comments**
	Is there an up-to-date inventory provided at the storage area? Does the inventory match the actual content on-site?		
	All wastes generated have been duly notified to DOE.		
	All consignment notes are appropriately fill up and kept in file.		
	All notification, inventory and waste movement (transport and prescribed premises) on eSWIS are duly updated.		
	All licenses from prescribed premises are up-to-date and kept in file.		