VOLUME 2:
THE ACHIEVEMENT OF SUPPORTING ACTIVITIES TO STRENGTHEN CAPACITY OF HWM ADMINISTRATION

Chapter 10

Updating HW Registration Data

10 UPDATING HW REGISTRATION DATA

The EMB and the JICA Study Team have established a computerized management system, known as a "HW management Database System," digitizing the registration data to strengthen the HWM administration in the Philippines.

At present, the only entities concerning HW management registered with the EMB are HW generators. The EMB lists others, such as treaters, transporters, importers and exporters that were known through applications to EBM for transportation, importation and exportation of HW.

To update the database to be integrated to the HWM database system, the JICA Study team and the EMB undertook renewing the registration data of the 720 HW generators identified in the Phase 1 Study and inputting the data of generators newly registered with the EMB after the Phase 1 Study. In addition to the registration of generators, the EMB and the Study Team prepared a registration form for treaters, transporters, importers and exporters and sent it to them to encourage their official registration with the EMB. These registration data is also included to the HWM database system.

10.1 Working Policy

10.1.1 Preparation of Registration Forms

As of the end of 2001, the EMB had a registration form only for HW generators. Since this registration form had some defects, which could lead simple mistakes during the filling out, the Study Team revised it based on the study on information necessary for HW management.

In addition, the Study Team prepared new registration forms for transporters and treaters, which were used for colleting necessary data for the database system.

10.1.2 HW Generators

Upon completion of the Phase 1 study, the number of registered HW generators was 1,079, and of that, the data on 719 generators was not perfect but could be used for the former DB system. As of the end of January 2002, the EMB had given DENR ID numbers to 2,088 HW generators.

Table 10.1.1 Registered HW Generators

Region	Registered HW Generators
01 Ilocos Region	33
02 Cagayan Valley	19
03 Central Luzon	125
04 Southern Tagalog	501
05 Bicol Region	55
06 Western Visayas	66

Region	Registered HW Generators
07 Central Visayas	197
08 Eastern Visayas	39
09 Western Mindanao	12
10 Northern Mindanao	85
11 Southern Mindanao	227
12 Central Mindanao	27
13 National Capital Region	626
14 Cordillera Administration Region	21
15 Autonomus Region Of Muslim Mindanao	4
16 Caraga	51
Total	2,088

Tasks for updating the existing registration data were shared between the Study Team and the EMB. The Study Team was responsible for renewing the registration data on 1,252 generators in the study area of Region 3, 4 and NCR, out of the data on 2,088 generators nationwide for which the EMB had assigned ID numbers as of January 2002.

The following was confirmed between the EMB and the JICA Study Team concerning the data updating work.

a. Registration data submitted by generators after completion of the Phase 1 Study are digitized as they are.
b. Registration data on the HW generators that have submitted four or more quarterly reports within the past two years shall be updated by using the data in the reports.
c. Registration data on the HW generators that have submitted less than four quarterly reports within the past two years shall be updated by information in the registration form mailed to and sent back from the generators.

The JICA Study Team decided to update the registration data on HW generators located in not only the Study area but also other areas because inputting data on the generators registered after the Phase 1 Study and updating data on the generators who submitted four or more quarterly reports did not hinder digitizing tasks due to its availability of the information.

10.1.3 Registration of the Others

The number of treaters, transporters, importers and exporters listed by the EMB is shown in the table below.

Table10.1.1 Number of Treaters, Transporters, Importer and Exporters

	Number Listed
HW treaters	42
HW transporters	125
HW Importers	40
HW Exporters	12

The JICA Study Team sent newly prepared registration forms to relevant entities and input data in the registration forms collected. The Study Team sent the forms to all the treaters, transporters, importers, and exporters because the information is indispensable for the HWMDBS and because there were not many companies listed. The EMB will continue to collect the registration forms that were not collected during the Study period.

10.2 Preparation of Registration Forms

Although the EMB revised the registration form for HW generators based on the proposed form prepared in the Phase 1 Study, the JICA Study Team and the EMB revised it again according to the contents of the quarterly report.

The HW generators shall be notified of the basic information of treaters, transporters importers and exporters according to the provision of DAO 92-29. Considering this notification, the Study Team prepared the registration forms to include the necessary information.

10.2.1 Study on Registration Forms

It is most important that the EMB, as an administrator of HW, understands the HW flow. The Study Team listed the enterprises concerned with HW and facilities necessary to be registered.

a. Enterprises
   - (1) HW Generators
   - (2) HW Treaters
   - (3) HW Transporters
   - (4) HW Importers
   - (5) HW Exporters

b. Treatment, Storage, Disposal (TSD) Facilities
   - A: Physicochemical Treatment Facility
   - B: Thermal Treatment Facility
   - C: Solidification Facility
   - D: Storage Facility
   - E: Disposal Facility
   - F: Recycle Facility

10.2.2 How to Give DENR ID

In order to identify the type of enterprise and location easily from the ID number, the first two letters of the ID indicate the type of enterprise, followed by the Region and Province codes. The regional and provincial codes are adjusted to the National Statistic Code.

Enterprises	
(1) HW Generators	GR xx – yy – zzzz
(2) HW Treaters	TR xx – yy – zzzz

(3) HW Transporters		TP xx – yy – zzzz
(4) HW Importers		IM xx – yy – zzzz
(5) HW Exporters		EX xx – yy – zzzz
xx: Region Code,	yy: Province Code,	z: Number

The EMB should recognize not only the above enterprises but also the TSD facilities in order to manage HW appropriately. Therefore, a letter indicating the type of TSD facility is put after the first two letters of the aforesaid ID number, as shown below.

TSD Facilities	
A: Physco-Chemical Treatment	GRA xx – yy – zzzz
B: Thermal Treatment	TRB xx – yy – zzzz
C: Solidification Treatment	TRC xx – yy – zzzz
D: Storage Facility	TRD xx – yy – zzzz
E: Disposal Facility	TRE xx – yy – zzzz
F: Recycle Facility	TRF xx – yy – zzzz

10.2.3 Information required for registration

The information required in the registration form for enterprises and TSD facilities are shown in the following matrices.

(1) Registration of enterprises

The required information for the registration of enterprises is divided into general information about the enterprise and specific information about the HW that the enterprise handles. Although the emergency plan, personnel training and waste minimization activities prescribed in DAO 92-29 are indispensable information about the enterprises, the JICA Study Team proposed that the existence of the documents be recorded as the digital data and that the original documents be kept in the regional office having jurisdiction over the location of the enterprise.

Figure10.2.1 Required Information for Registration of Enterprises

	HW Generator	HW Treater	HW Transporter	HW Importer	HW Exporter
1. General Information	○	○	○	○	○
2. HW Information	○				
3. Treatment Premises Information (if GR has)	○				
4. Emergency Plan	○	○	○	○	○
5. Personnel training	○	○	○		
6. Waste minimization activities	○				

* 4, 5, 6 are printed data

Figure 10.2.2 General Information on Enterprises

	A HW Generator	B HW Treater	C HW Transporter	D HW Importer	E HW Exporter
1. DENR ID	○	○	○	○	○
2. Date of issuance	○	○	○	○	○
3. Name	○	○	○	○	○
4. Address (incl. Tel/Fax)	○	○	○	○	○
5. Date of establishment	○	○	○	○	○
6. Name of Pollution Control Officer	○	○			
7. Contact of PCO (Tel/Fax, e-mail)	○	○			
8. General description of business	○	○			
9. PSIC	○				
10. Major products	○				
11. Authorized capitalization	○	○			
12. Approx. annual capitalization	○	○	○	○	○
13. Approx. annual turn-over	○	○	○	○	○
14. Total no. of employees	○	○	○		
15. No. of employees for administration	○	○	○		
16. No. of employees for manufacturing					
17. Transport capacity (ton/equipment)			○		
18. Appended data					
18-1 Process flow	○				
18-2 Mass balance	○				
18-3 Existing Waste Management Plan	○				
18-4 Waste Analysis	○				
19. Transportation Equipment			○		

Figure 10.2.3 Information on Hazardous Waste

	HW Generator	HW Treater	HW Transporter	HW Importer	HW Exporter
1. HW Number	○	○	○	○	○
2. HW Name & Description	○	○	○	○	○
3. HW Nature (Lq, So, Sl, Ga)	○	○	○	○	○
4. HW Characterization (toxic, corrosive etc.)	○				
5. HW Amount generated (ton/quarterly/year)	○				
6. HW Amount treated on-site (ton/q/y)	○				
7. HW Amount stored on-site (ton/q/y)	○				
8. HW Amount disposed on-site (ton/q/y)	○				
9. HW Amount treated off-site (ton/year)	○				
10. HW Amount stored off-site (ton/year)	○				
11. HW Amount disposed off-site (ton/year)	○				
12. HW Amount disposed (ton/year)	○				

Lq: Liquid, So: Solid, Sl: Sludge, Ga: Gas

(2) Registration of TSD Facilities

A registrant of TSD facilities must be a generator or a treater. A TSD facility of a generator is what is called a facility for the on-site treatment.

Figure 10.2.4 Required Information for Registration of TSD Facilities

	A. Physicochemical Treatment Facility	B. Thermal Treatment Facility	C. Solidification Facility	D. Storage Facility	E. Disposal Facility	F. Recycle Facility
1. DENR ID	○	○	○	○	○	○
2. Date of issuance	○	○	○	○	○	○
3. Name of owner (company) of the facility	○	○	○	○	○	○
4. Address of the facility	○	○	○	○	○	○

	A. Physicochemical Treatment Facility	B. Thermal Treatment Facility	C. Solidification Facility	D. Storage Facility	E. Disposal Facility	F. Recycle Facility
5. Date of establishment (Permit to Operate)	○	○	○	○	○	○
6. Type of treatment method	○	○	○	○	○	○
7. Type of HW capable to treat	○	○	○	○		○
8. HW treatment capacity (ton/day)	○	○	○	○	○	○
9. Appended data						
9.1 Copy of ECC	○	○	○	○	○	○
9.2 Copy of Permit to Operate	○	○	○	○	○	○

According to the above matrices, the JICA Study Team proposed the registration forms as shown in Annex 8, and the EMB officially approved them.

10.3 Update of the Registration Data of HW Generators

Although the EMB has 2,088 HW generators registered as of the end of 2002, only registration data on 719 generators digitized during the Phase 1 Study could be used for the database. Only the ID number, name, and address of the generator are digitized for the generators registered after the Phase 1 Study.

There were 704 HW generators registered after the Phase 1 Study whose data, using the old registration form, had been kept on the registration form in the EMB Central Office. The number of HW generators located in the CALABARZON area and NCR who had submitted less than four quarterly reports within the past two years are 412. The JICA Study Team sent revised registration forms to these 412 HW generators and collected 236 by the end of February 2002, and 44 generators submitted registration data using the form revised by the EMB.

Therefore, the JICA Study Team has digitized the registration data on 984 generators in total.

Table 10.3.1 Number of Generator Registration Data Encoded

	Old form	New form	Other	Total
01 Ilocos Region	15			15
02 Cagayan Valley	17			17
03 Central Luzon	18	18	5	41
04 Southern Tagalog	146	84	22	252
05 Bicol Region	2			2
06 Western Visayas	23		3	26
07 Central Visayas	90	23	3	116
08 Eastern Visayas		2		2
09 Western Mindanao	4			4
10 Northern Mindanao	42	1	7	50
11 Southern Mindanao	91			91
12 Central Mindanao	2	19		21
13 NCR	201	72	4	277
14 CAR	12			12
15 ARMM				0
16 Caraga	41	17		58
Total	704	236	44	984

On the other hand, 1,709 quarterly reports were submitted from January 2000 to the end of December 2001, and 136 HW generators submitted four or more reports within this period. Among the 16 Regions, most reports were from Southern Tagalog, followed by NCR and then Central Visayas.

The JICA Study team updated the registration data of HW generators having submitted four or more quarterly reports by using these data. However, the old data on general information not described in the quarterly report were not updated.

Table 10.3.2 Number of Quarterly Reports Submitted

	2000				2001				Total
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	
01 Ilocos Region			1	3	3	2	3	1	13
02 Cagayan Valley					1	3			4
03 Central Luzon	1	2	5	7	12	20	19	17	83
04 Southern Tagalog	20	20	83	127	115	181	175	118	839
05 Bicol Region	2	1	2		5	4	4		18
06 Western Visayas				2	4	4	8	3	21
07 Central Visayas	6	5	6	13	48	47	58	37	220
08 Eastern Visayas		1	2	8	6	9	9	5	40
09 Western Mindanao			1	1	1	1	3	1	8
10 Northern Mindanao				1					1
11 Southern Mindanao	1	1			16	6	4	2	30
12 Central Mindanao		1	1	5	8	7	6	2	30
13 NCR	6	8	32	42	45	89	95	65	382
14 CAR			1	1	2	3	6	2	15
15 ARMM		1	1						2
16 Caraga					1	1	1		3
Total	36	40	135	210	267	377	391	253	1,709

10.4 Registration Data of the Others

The JICA Study team sent the newly prepared registration form mentioned above to the HW treaters, transporters, importers and exporters.

Table 10.4.1 Collection Rate of the Registration Forms Sent to the Others

	Treaters	Transporters	Importers	Exporters	Total
No. of forms sent	42	125	40	12	219
R-Forms collected	10	35	4	5	54
Collection rate	23.8%	28.0%	10.0%	41.7%	24.7%

Only a quarter of the enterprises listed by the EMB submitted the registration form the JICA Study Team had sent directly. They seem cautious since this is the first experience of registration for the treaters, transporters, importers and exporters.

The EMB has been requested to endeavor to improve the collection rate and to take over the encoding work the JICA Study Team conducted for the registration data additionally collected.

10.5 Recommendation of Updating Data

The Hazardous Waste Management Database System (HWMDBS) presented in the next chapter will be helpful if the database installed is updated constantly. All the work concerning registration is conducted at the EMB central office. Because about 450 documents, such as transport permit applications, import/export permit applications and manifests etc., are sent to the central office monthly at present, the central office staff cannot handle the task of digitizing and/or updating the registration data.

To utilize the HWMDBS effectively, the regional offices are expected to digitize and update as much of the registration data as possible to reduce the burden of the central office. Therefore, the central office will be requested to analyze and evaluate the data sent from the regional offices and defuse and execute an appropriate management system based on the results of the analysis.

On the 7th and 8th of March, 2002, the JICA Study Team held a seminar targeting the staffs of Regions 3, 4, and NCR to explain the DB system. From the 5th to the 13th of September, the JICA Study Team trained the staff of Region 7 and 11 offices to operate the HWM database system respectively. The Study Team inquired about the capability of the regional staff to carry out encoding work using the DB system and operating it. As a result, the need to strengthen the staff's capability to evaluate the registration data submitted, and to train them to classify the HW and enter the registration forms was recognized.

Therefore, the JICA Study Team trained the EMB regional staff, putting emphasis on strengthening their capacity to evaluate the registration data. Workshops targeting the staff of the CALABARZON area were held in May, and those for the staff of all regions in September. The EMB has to decentralize the registration works and

continue to strengthen its capacity through "on the job training" taking advantage of the training given by the JICA Study Team.

Chapter 11

HW Management Database System

11 HW MANAGEMENT DATABASE SYSTEM

11.1 Background and Objectives of the Development of the HWM Database System

Before the HWM DB System is established, the EMB had a "Hazardous Waste Tracking System" consisting of hardware and software donated as one sphere of the Industrial Environmental Management Project carried out by the USAID during 1991 and 1996. The registration data on 554 HW generators were inputted while this system was being operated during 1995 and 1996. After 1996, data had not been inputted in or outputted from the system since it was infected by a computer virus. Therefore, the EMB staffs have been forced to issue the transport permit by looking up registration forms and relevant documents.

The JICA Study Team developed the HWM DB System to computerize all the registration data, which enables the EMB to analyze and search a mass of data. In addition, the Study Team installed the computer network for the regional offices to conduct registration works that had been carried out exclusively by the EMB central office, according to the EMB's policy on decentralization of works. The HWM DB System has created environment for the EMB to utilize human resources within the organization and for the central office staffs to develop and monitor a comprehensive plan on HWM.

11.2 Network Architecture

The EMB central office is connected to the Internet through an Internet service provider, and has 24-hour unlimited access via cable modem with 64k (full), Internet static IP addresses, e-mail service, domain name hosting, and the like. Although MIS has multiple static IP addresses, they have been using one through a single main Proxy Server, which intensively controls their whole network. This condition reduces the access speed and increases the possibility of a breakdown of the network system.

To avoid the above inconveniences, a new hub was set between the intranet of MIS and the cable modem so that each work group, small networks working within, can work independently without affecting the performance of other work groups. In this project, the LAN of MIS has been configured as shown below for the Hazardous Waste Database Management System:

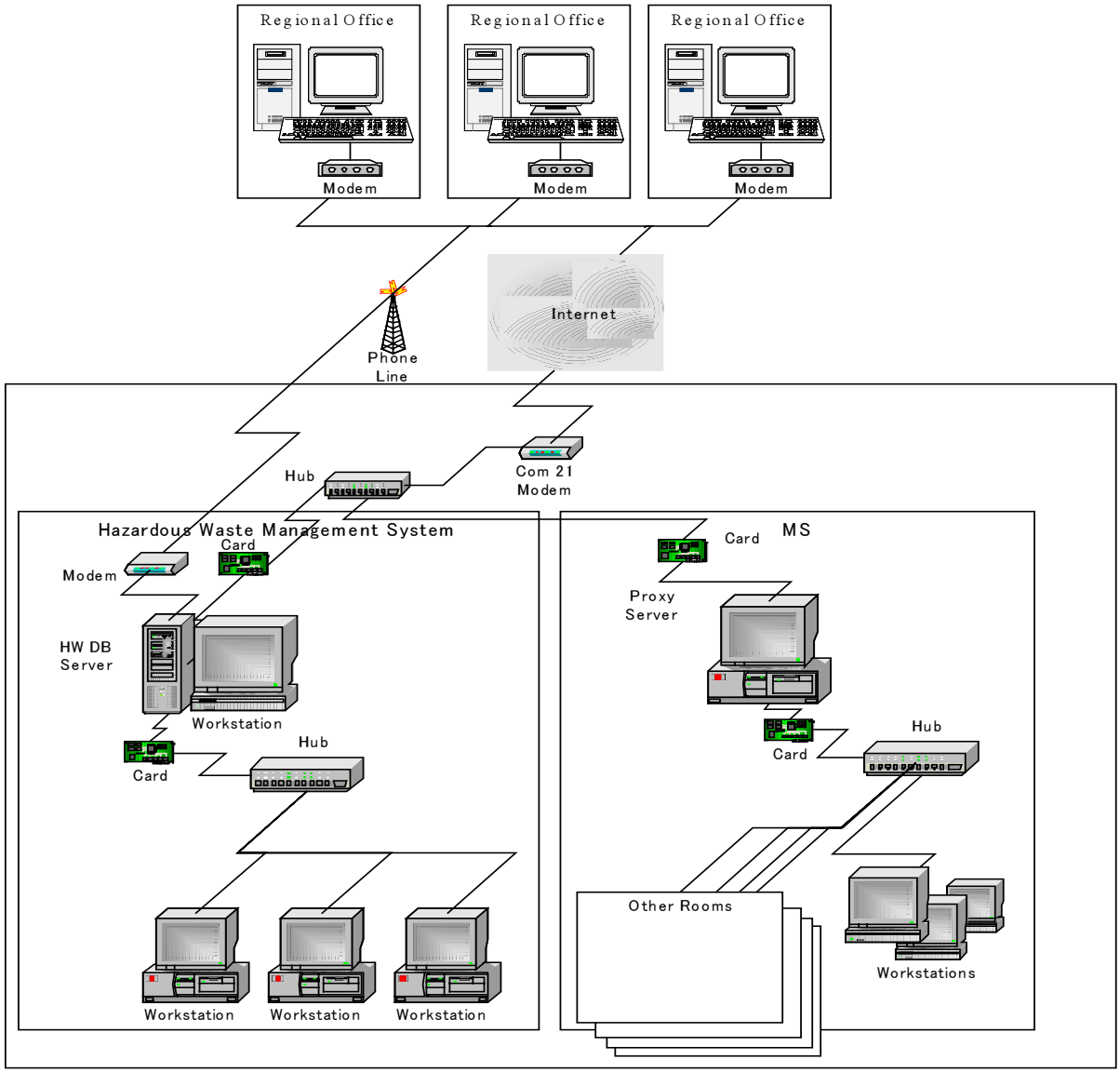

Figure 11.2.1 Suitable Network Architecture for the HWMDBS

11.3 HW Management Database System

11.3.1 Objective of the HWM DB System

The HWM DB System is designed to improve productivity of EMB services by digitally managing and analyzing the information on generators, treaters, transporters, importers and exporters and quarterly reports from generators.

11.3.2 Features of the HWM DB System

The HWM DB System has the following features:

- The system increases the efficiency of hazardous waste management services by sharing information within the EMB through a network.

- Because there is no limit to the number of users and no restriction on the location of users, it is easy to extend the area covered by the database system. (Note: License fee for Microsoft products is required.)
- The system is based on an object oriented programming concept, which would reduce the work and cost for modifying or expanding the capability of the system in the future.
- The system is designed to be user-friendly; each tool is arranged so that the user can find it intuitively and little instructions are needed to operate the system.

11.3.3 Design of the Functions of the HWM DB System

The design of the functions of this system is as follows:

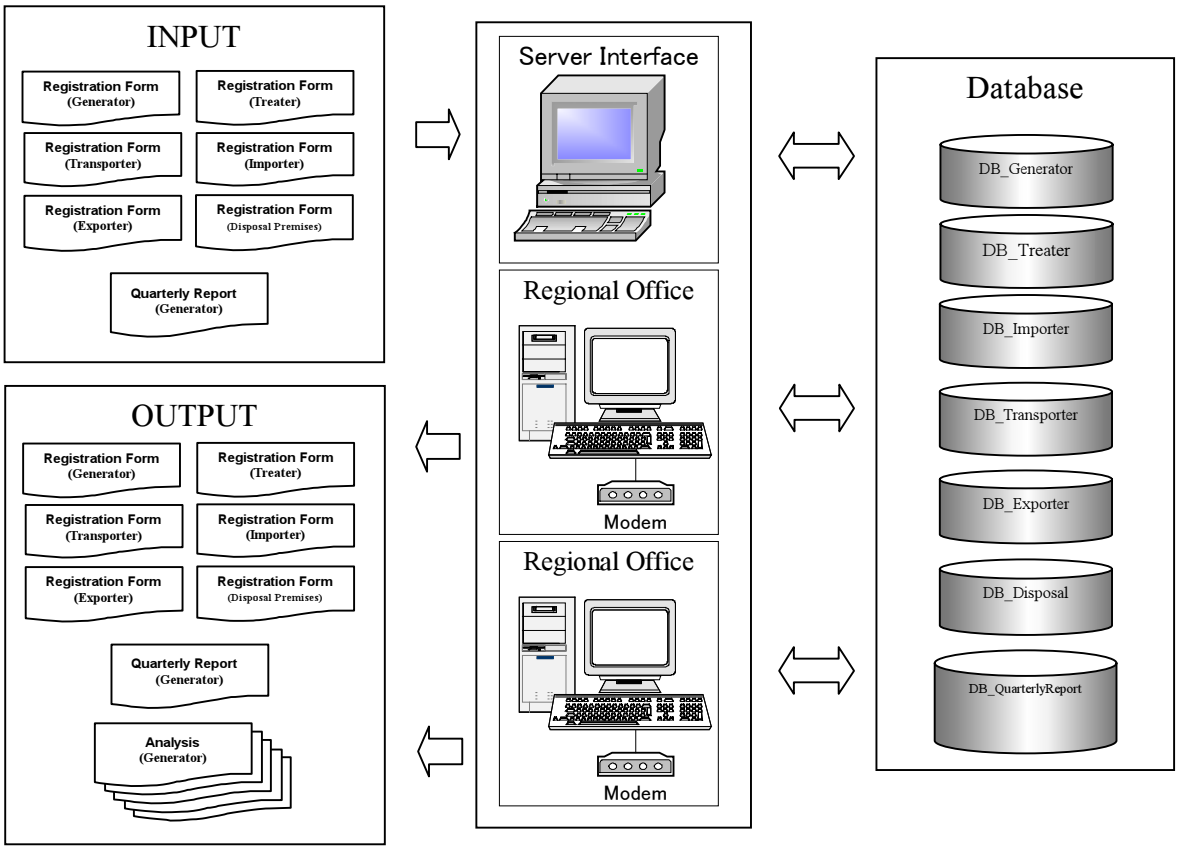

Figure 11.3.1 Design of the Functions of HWM DB System

11.3.4 Outline of the Functions

The major function of the system is to manage the hazardous waste database: the database of the registration information and the database of the Quarterly Reports. The functions are designed to edit, search, update, delete, print and analyze the database.

Table 11.3.1 Outline of the Functions of the System

Outline of the Functions		Subject	Related DB
Management of Registration Forms	**Edit** Edit registration data based on submitted registration form with new DENR ID. **Search** Search registration data by name, by DENR ID or both. **Update** Update the registration data of the selected organization. **Delete** Delete the registration data of the selected organization. **Print** Print the registration data of the selected organization. **Analysis** Analyze the registration data of the selected organization.	Generator	DB_Generator
		Treater	DB_Treater
		Transporter	DB_Transporter
		Importer	DB_Importer
		Exporter	DB_Exporter
		TSD Facilities	DB_TSD Facilities
Management of Quarterly Reports	**Edit** Edit Quarterly Report data based on submitted Quarterly Report. **Search** Search Quarterly Report data by name, by DENR ID or both. **Update** Update the Quarterly Report data of the selected organization. **Delete** Delete the Quarterly Report data of the selected organization. **Print** Print the Quarterly Report data of the selected organization. **Analysis** Analyze the Quarterly Report data of the selected organization.	Generator	DB_QuarterlyReport

11.3.5 Structure of HW Management Database

The Study Team and the EMB discussed the information required for the Database System, and the outcomes are shown in Chapter 10. The information will be encoded by the regional offices and then transferred into the database in a Microsoft SQL Server format.

The figure shown below is the basic concept of the database based on the identification of the required information. Each of the blackened boxes is a table of the Database System with a normalized shape.

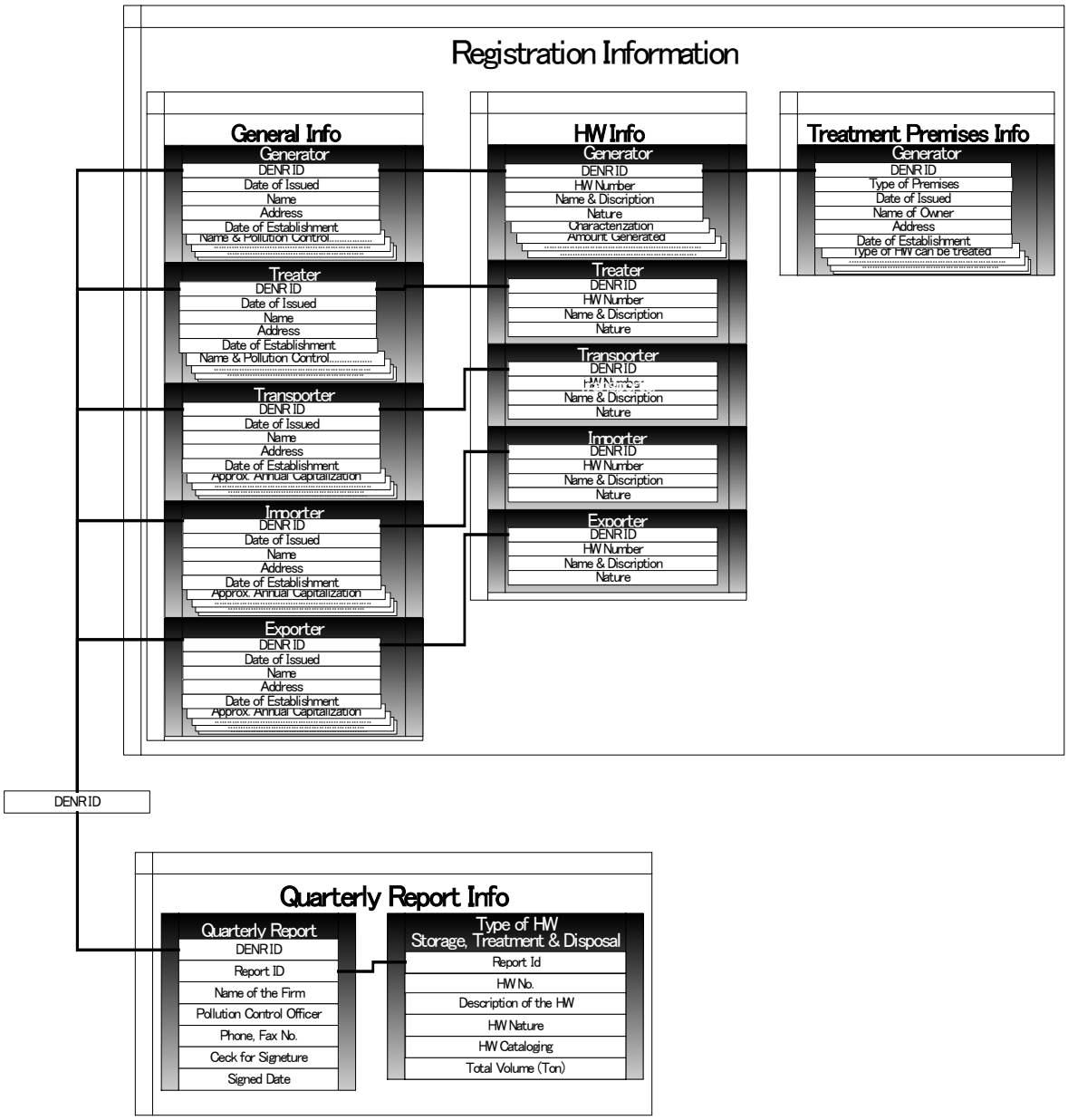

Figure 11.3.2 Structure of HW Management Database

11.4 System Development

System establishment works were completed by the end of March 2002, and the registration data that had been edited was imported to the system. The HWM Database System was installed in the computers in the Central Office and Regions 3, 4A, NCR, 7, and 11 offices in May and September 2002.

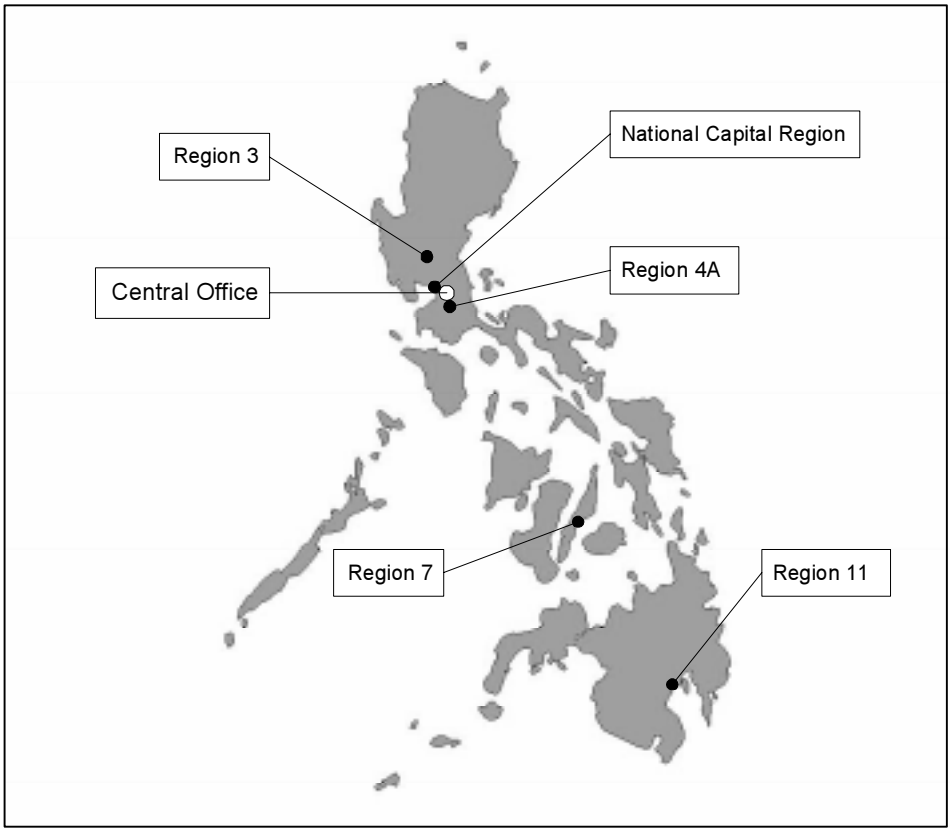

Figure 11.4.1 EMB Offices with the Database System Installed

11.5 Training on the System Operation

The JICA Study Team conducted training of the EMB staffs on the system operation during the 2nd and 3rd Study work in the Philippines after HWM DB System Version 1.1 was completed. It requires many years for a person who has not learned software engineering to fully understand the HWM DB System coding, the database management system and the operating system itself. It is not realistic to teach everything described above. Instead, giving training on the system operation concerning the configuration of the network setting and accounts for both operating system and database management system was considered effective and feasible during the Study. To operate the system, knowledge of the networking of the Windows 2000 Server and configuration of the SQL 2000 Server accounts is required as a minimum skill. Based on the condition described above, training on the system operation was conducted as follows:

1) System Management: Network & Account Setting
   To operate the HWM DB system, users are required to access and log on to not only the Windows 2000 Server but also the SQL 2000 Server either through the intranet or a dial-up network (remote access network). Therefore, training as described below was given to the MIS members and Mr. Lito, who is likely to manage the database mainly within the EMB central office.
   a) The way to give the new account, configure the rights of each account, and configure remote access setting on the Windows 2000 Server.

b) The way to give the new account and configure the rights of each account on the SQL 2000 Server.

2) System Operation: HWM DB System operation.
Training on the HWM DB System operation was conducted at each central and regional office (NCR, Regions 3 and 4 during the 2nd Study work in the Philippines; Regions 7 and 8 during the 3rd Study work in the Philippines; and the EMB central office during the both Study works). The training consisted of two sessions, the first one for system orientation in which the functionality and role of the system were described and the second one for encoding the registration forms and quarterly reports.

11.6 Recommendation for the HWM DB System

The followings are recommended to maintain this HWM Database System in a good condition so that the EMB staffs can utilize the system for the HW management.

Inputted data contain unit errors, value errors, data type errors, and the like because of the mistakenly filled out registration forms; those errors are hazardous to the system's performance. Thus, the level of inner data security has loosened to prevent system calls from occurring (i.e. system down caused by illegal dataset). This condition, however, sacrifices the system's stability; therefore, it should be improved by enhancing data check security as the existing data improves.

Every business application is designed to improve productivity of their business or service by automating some part of their business procedures. Therefore, the application model or design reflects the real business procedures or business model just as the HWM DB System. The current business model of hazardous waste management carried out by the EMB should be changed as the surrounding environment changes. Therefore, the HWM DB System should be improved or adjusted as the business model changes.

The database updated during the Study covers a part of the Philippines, so additional data construction is needed to enlarge the database to cover every region in the Philippines.

As data construction progresses, it is necessary to acquire geographical information for more precise and comprehensive HW management. Obtaining both numerical or statistical and geographical information helps to identify the underlying conditions or problems, which makes it possible to provide more realistic and effective services. A Geographic Information System (GIS) provides comprehensive services integrating numerical information and geographical information. Integrating the HWM DB System into GIS is strongly recommended.

Chapter 12

Development of Technical Requirements for Hazardous Waste Management

12 DEVELOPMENT OF TECHNICAL REQUIREMENTS FOR HAZARDOUS WASTE MANAGEMENT

12.1 Preparation of Technical Requirements

Based on RA6969 and DAO 92-29, the JICA Study Team has developed technical requirements that are necessary for actual implementation of HWM administration. During the JICA Study on Industrial Hazardous Waste Management (Phase 1), lack of detailed regulations for RA6969 and DAO 92-29 was identified as a large obstacle to enhance HWM administration. Especially no provision on technical requirements for TSD facilities and waste acceptance criteria for landfills is considered as one of the major factors preventing investment in TSD facility construction. Moreover, ambiguity of classification of HW in Table 1 of DAO 92-29 has been causing misunderstanding over HW regulated by DAO 92-29 between the competent authority and HW generators. To contribute to the solution of these issues, the JICA Study Team was tasked to prepare the following technical requirements:

- Definition of inert hazardous waste residues
- Classification of hazardous waste
- Requirements for authorized waste transporters
- Criteria for issuing Transport Permit
- Labelling requirements
- Classification of TSD facilities
- Technical requirements for TSD facilities

During the preparation of the technical requirements, there was a question about incinerators that DAO 92-29 recognizes as one of the TSD facilities whether incineration of HW is contrary to the *Ban on Incineration* provision in CAA. If incineration cannot be employed as treatment method of HW, unprecedented methods are necessary to treat organic HW. It is impractical to set technical requirements for treatment methods other than incineration for the treatment of organic HW even if state-of-the-art technology is employed. Even though the requirements are set, no economically feasible method to treat organic HW is available, and HW generators would face a great deal of difficulty to treat HW. In addition, the policy set in Section 24.2 d of DAO 92-29 (landfill of inert hazardous waste residues) could not be achieved. If CAA totally bans incineration of HW, it would contradict to the HWM policy.

The JICA Study Team presented its interpretation of the *Ban on Incineration* provision in CAA in November 2001 that Section 20 of CAA and Section 1 of Rule XXVIII of DAO 2000-81 do prohibit incineration of municipal, biomedical and hazardous waste that emits toxic and poisonous fumes but not all the incineration (see Annex 1). The Supreme Court also presented the same interpretation in its ruling for the MMDA vs. Jancom case in January 2002, and the case was closed in May

2002. The Supreme Court's ruling states that "Section 20 does not absolutely prohibit incineration as a method of waste disposal; rather only those burning processes which emit poisonous and toxic fumes" (G.R. 147465 (MMDA vs. Jancom) dated January 30, 2002). Therefore, the preparation of technical requirements for incinerators became worthwhile.

These technical requirements are going to be integrated into the Procedural Manual for HWM as described in Chapter 12.2. The EMB will authorize the Procedural Manual as DAO and implement it in the future, which enables the EMB to guide HWM stakeholders to conduct proper HWM by clarifying classification of HW, defining inert hazardous waste residues, and showing other standards of proper HWM. Implementation of these technical requirements would also encourage investment in TSD facility construction.

12.1.1 Definition of inert hazardous waste residues

Section 24 of DAO29 clearly provides that the Department encourages proper management of hazardous wastes generated within the country by promoting, in order of preference:

a. minimization of the generation of hazardous waste;
b. recycling and reuse of hazardous waste;
c. treatment of hazardous waste to render it harmless; and
d. landfill of inert hazardous waste residues.

The inert hazardous waste residues are defined as follows:

Inert hazardous waste residue means treated waste that does not undergo any significant physical, chemical or biological transformations and will not dissolve, burn or otherwise physically or chemically react, biodegrade or adversely affect other matter with which it comes into contact in a way likely to give rise to environmental pollution or harm human health. The total leachability and pollutant content of the treated waste and the ecotoxicity of the leachate must be insignificant, and in particular not endanger the quality of surface water and/or groundwater.

As parameters of inert hazardous waste residues, ignition loss, total of organically bound carbon, moisture contents, pH of eluate, concentrations of hazardous substances including PCBs in eluate, and volume ratio of dioxins/furans are selected. Detailed discussion on the rationale for the selection of parameters and values are described in Annex 4). Since only inert hazardous waste residues can be disposed of in landfills, the criteria of inert hazardous waste residues are taken as waste acceptance criteria for landfills (TSD facility, Category C) as authorized by DENR.

Inert hazardous waste residue shall meet the following criteria:

Item/Substance	Value/Concentration
Ignition Loss	$\leqq$ 5 %
Total of organically bound carbon TOC (as C)	$\leqq$ 5 %
Moisture contents	$\leqq$ 85 %
pH (in eluate)	6.0 $\leqq$ pH $\leqq$ 9.0

Item/Substance	Value/Concentration
Arsenic (as As)	≦ 0.3 mg/l*
Lead (as Pb)	≦ 0.3 mg/l*
Cadmium (as Cd)	≦ 0.1 mg/l*
Chrome, hexavalent (as Cr)	≦ 1.5 mg/l*
Mercury (as Hg)	≦ 0.01 mg/l*
Cyanide, easily releasable (as CN)	≦ 0.7 mg/l*
Boron (as B)	≦ 9.0 mg/l*
Selenium	≦ 0.3 mg/l*
PCBs	≦ 0.003 mg/l*
Dioxins and Furans	≦ 3 ng/g

*The value indicates concentration of the substances in eluate.

12.1.2 Classification of Hazardous Waste

Table 1 of DAO 92-29 provides classification of hazardous waste to be regulated under RA6969. However, the classification lacks descriptions of each subcategory of hazardous waste, which makes both the authority and the industry having a difficulty in identifying what hazardous wastes are. EMB requested JICA to extend the study and prepare a revised classification of hazardous waste. The JICA Study Team tried to clarify classification of hazardous waste; the revision policy and the proposed classification are described in Annex 5 in detail.

12.1.3 Requirements for authorized waste transporters

A person who wishes to be authorized as waste transporter by DENR shall be required to have:

a. conveyances that meet the followings:
   - having the structure that would not release hazardous waste and/or odor generating from hazardous waste to the outside of the conveyance
   - being equipped with emergency response equipment such as sand, fire distinguisher, a pump to vacuum spilled liquid waste, and first aid kits
   - being corrosion-resistant if the prospective waste transporter wishes to convey waste acid or waste alkali
   - being equipped with facilities to prevent infectious waste from turning putrid if the prospect waste transporter wishes to convey infectious waste
b. transfer stations that meet technical requirements for storage as provided in a different provision if a prospective waste transporter plans to transship hazardous wastes
c. a hazardous waste transport management plan
d. an emergency contingency plan as provided in a different provision

e. drivers and staff with training on the emergency contingency plan and proper handling, store, and transport of hazardous wastes
f. a person in charge of supervising hazardous waste transport (hazardous waste transport manager) who has attended a seminar on hazardous waste transport held be EMB
g. an insurance policy or applicable financial instrument covering public and pollution liability during the registered period

12.1.4 Criteria for issuing Transport Permit

Waste transporters are required to secure Transport Permit from EMB prior to the commencement of transport of hazardous waste. Waste transporters shall meet the following criteria for securing Transport Permit:

a. A person who wishes to convey hazardous waste has a valid waste transporter license.
b. A conveyance to be used for transporting hazardous waste is suitable for the characteristics of the waste to be transported.
c. A waste transporter has a spill response plan prepared by a waste generator whose hazardous waste is to be permitted for transport.
d. A person whose hazardous waste is to be permitted for transport has notified EMB as waste generator.
e. A person who recycles, reprocesses, treats, or disposes of hazardous waste to be permitted for transport has a valid waste treater license and Permit to Operate.
f. A waste treater is permitted to recycle, reprocess, treat, or dispose of hazardous waste to be permitted for transport.
g. A waste treater operates the TSD facility that has enough capacity to recycle, reprocess, treat, or dispose of the quantity of hazardous waste to be permitted for transport.
h. A waste generator and a waste treater have made a contract on the treatment of hazardous waste to be permitted for transport.
i. Responsibilities and liabilities of waste generator, transporter, and treater for clean-up operations and compensation for damages to properties and life in case of spill and other accidents/emergencies are clarified and confirmed among each party involved.

12.1.5 Labelling requirements

(1) Types of storage required for labeling

Labeling requirements are applied to the following types of storage:

a. Hazardous waste stored temporarily on waste generator's premises
b. Hazardous waste packaged prior to transport from a waste generator to a waste treater
c. Hazardous waste stored temporarily on waste transporter's premises while awaiting transshipment
d. Hazardous waste stored temporarily on a TSD facility before recycling, reprocessing, treatment, and/or disposal

e. Hazardous waste stored in the storage as Category F of TSD facility (a facility to store hazardous waste for the period exceeding 30 days)

(2) Types of vessels, containers, and tanks used for storage of hazardous waste

Vessels, containers, and tanks used for storage of hazardous waste include:

a. Metal drum (with a lid or a cap)
b. Plastic container
c. Metal container
d. Cloth container
e. Container van
f. Tanker truck
g. Built tank
h. Containment building (completely enclosed structure with four walls, a roof, and a floor used to store non-containerized waste, such as bulky and high volume non-liquid waste)
i. Settling ponds not used as treatment of wastewater

(3) Form of labels attached to vessels, containers, and tanks

Any vessel, container, or tank that contains hazardous waste shall be labeled as specified below.

a. The size of the label is minimum 20cm x 30cm.
b. The color of the label is yellow for background and black for letters conspicuously marked in paint or other permanent form of marking
c. The material of the label is scratch-proof and resistant to chemicals
d. The basic form is provided in Table 12.1.1.
e. The label is accompanied by a symbol corresponding to characteristics of the hazardous waste contained in the vessel, container, or tank as specified by a different provision.

Table 12.1.1 Basic form of the label attached to vessels, containers, and tanks containing hazardous waste

HAZARDOUS WASTE		
Waste Information	HW Class	Name of the hazardous waste class as specified in Appendix ***
	HW Sub-category	Name of the hazardous waste sub-category as specified in Appendix ***
	HW Code	Code of the hazardous waste sub-category as specified in Appendix ***
	Characteristic	Toxic, Corrosive, Flammable, Explosive, Reactive, and/or Infectious
	Form	Liquid, Solid, or Sludge
	Volume	Volume of the hazardous waste contained in the vessel, container, or tank.
	Packaging date	Date on which the hazardous waste is packed in the vessel, container, or tank.
	Shipping date	Date on which the hazardous waste must be removed from the storage area and transported off site if applicable
	Waste transport record number	Manifest number if transported off site
Container Information	Capacity	Maximum capacity or volume of the container
	Material	Materials that a vessel, container, or tank is made from
Generator Information	ID number	ID number issued by DENR
	Name	Name of the waste generator (company name)
	Address	Address of the waste generator
	Telephone #	
	Fax #	
	Name of PCO	Name of Pollution Control Officer

(4) Position of the label attached to vessels, containers, and tanks

The label shall be attached to the side of the vessel, container, and tank. If the vessel, container, or tank is used repeatedly, such as a tank truck and a containment building, the label can be a plate and hung on the side of the device that stores hazardous waste.

(5) Characteristics of hazardous waste to be represented by symbols

Symbols accompanying the label represent the following characteristics of hazardous waste:

a. Explosive

Any substance or article which is designed to function by explosion, or which, by chemical reaction within itself, is able to function in a similar manner even if not designed to function by explosion.

b. Flammable (Ignitable)
Liquid: any liquid having a flash point of not more than 60.^{o}C, closed-cup test, or 65.6^{o}C, open-cup test.
Solid: any of the following three types of materials; wetted explosives that when dry are explosives; self-reactive materials that are liable to undergo, at normal or elevated temperatures, a strongly exothermal decomposition caused by excessively high transport temperatures or contamination; or readily combustible solids that may cause a fire through friction, show a burning rate faster than 2.2 mm per second, or be ignited and react over the whole length of a sample in 10 minutes or less.

c. Reactive or Oxidizing
A material that may, generally by yielding oxygen, cause or enhance the combustion of other materials.
Any organic compound containing the bivalent -0-0- structure, that is thermally unstable and can undergo exothermic self-accelerating decomposition.

d. Toxic
A substance which, if it is inhaled or ingested or if it penetrates the skin, may involve serious acute or chronic health risks including carcinogenicity, teratogenicity, and mutagenicity on human and other life forms.

e. Corrosive
A liquid or solid that causes visible destruction or irreversible alterations in human skin tissue at the site of contact, or a liquid that has a severe corrosion rate on steel or aluminum.

f. Infectious
Containing a viable microorganism (or its toxin) which is known or suspected to cause disease in humans or animals.

(6) Symbols to be attached to vessels, containers and tanks
Vessels, containers, and tanks that contain hazardous waste with the characteristics of explosive, flammable, corrosive, reactive, toxic, or infectious and conveyances carrying these vessels, containers, and tanks shall be attached with symbols as specified below.

a. The minimum size of the symbol is 25 cm x 25cm for vessels, containers, and tanks and 30cm x 30cm for conveyances carrying vessels, containers, and tanks.
b. Basic shape of the symbols is a square rotated 45 degrees to form a diamond.
c. At each of the four sides, a parallel line shall be drawn to form an inner diamond 95 % of the outer diamond.
d. The color of the lines forming the diamonds is the same as the color of the symbol.
e. Basic presentation for each characteristic of hazardous waste is shown in Figure 12.1.1 to Figure 12.1.6.

Figure 12.1.1 Explosive	Figure 12.1.2a. Flammable Liquid	Figure 12.1.2b. Flammable Solid
		
Figure 12.1.3 Reactive	Figure 12.1.4 Toxic	Figure 12.1.5 Corrosive
		
Figure 12.1.6 Infectious		
		

(7) Position of the symbol attached to vessels, containers, and tanks

a. Vessels, containers, and tanks

The symbol shall be attached to the side of the vessel, container, and tank. If the vessel, container, or tank is used repeatedly, such as a tank truck and a containment building, the symbol can be a plate and hung on the side of the device that stores hazardous waste.

b. Conveyances carrying the vessels, containers, and tanks

The conveyances transporting hazardous waste shall place the corresponding symbols on its side and back.

12.1.6 Specification of TSD Facilities

Six categories of the prescribed treatment and disposal premises provided by Section 30.1 of DAO29 can be specified as follows:

(1) Category A (Premises that conduct on-site disposal of hazardous wastes generated or produced at the premises through industrial or commercial processes and activities other than disposal via sewer)

Facilities in Category A are the following facilities located on the waste generator's premises:

A-1 Facilities that incinerate or first gasify and then incinerate the hazardous waste generated or produced at the premises
A-2 Facilities that dispose of only the inert hazardous waste residues generated at the premises in areas intended as permanent repositories
A-3 Facilities that immobilize, encapsulate, polymerize or treat hazardous waste generated or produced at the premises except facilities categorized as A-1

(2) Category B (Commercial or industrial hazardous waste thermal treatment facilities)

Facilities in Category B are the following facilities not located on the waste generator's premises:

B-1 Incinerators
B-1-1 Facilities to incinerate wastes in PVC containers, organic chlorinated solvents, waste containing PCB, or waste pesticide containing persistent organic pollutants (POPs)
B-1-2 Facilities to incinerate hazardous wastes other than B-1-1
B-2 Facilities to gasify and incinerate hazardous waste

(3) Category C (Landfills, dumps or tips that accept hazardous waste for disposal)

Facilities in Category C are the facilities that accept only the inert hazardous waste residues for final disposal and not located on the waste generator's premises.

(4) Category D (Premises that recycle or reprocess hazardous waste which were not generated or produced at that premises)

Facilities in Category D are the facilities that receive hazardous waste from outside of the premises and recover valuable materials from the hazardous wastes, use hazardous waste as input materials or fuels for production, or produce compost by biological treatment of hazardous waste.

(5) Category E (Premises that immobilize, encapsulate, polymerize or treat hazardous waste which were not generated or produced at that premises)

Facilities in Category E are the following facilities that receive hazardous waste from outside of the premises and transform physical and/or chemical characteristics of the hazardous waste by physicochemical or thermal treatment other than incineration or in order to dispose of them into the facilities in Category C:

E-1 Facilities to solidify sludge, ashes, and other hazardous wastes
E-2 Facilities to melt and solidify inorganic sludge, ash, and other inorganic hazardous waste
E-3 Physicochemical treatment facilities including neutralization, oxidization, and reduction of waste acid, waste alkali, or waste solution containing cyanide or chromium
E-4 Facilities to thermally decompose waste containing cyanide
E-5 Facilities to separate and collect PCB from waste
E-6 Facilities to decompose PCB (excluding those to decompose PCB by high temperature)
E-7 Facilities to melt asbestos

E-8 Facilities to autoclave or chemically treat infectious waste
E-9 Facilities to rinse containers that used to contain hazardous waste

(6) Category F (Premises that store hazardous wastes, which were not generated or produced at that premises for periods exceeding 30 days)

Facilities in Category F are the following facilities that store the hazardous waste not generated or produced at the premises for the period exceeding 30 days and that are owned and operated by a waste generator or a waste treater:

F-1 Open space to place containers, vessels, or tanks containing hazardous waste
F-2 Buildings to store containers, vessels, or tanks containing hazardous waste
F-3 Built tanks to store liquid hazardous waste
F-4 Buildings to store hazardous waste not in containers, vessels, or tanks
F-5 Settling ponds to hold liquid hazardous waste but not treat the waste

12.1.7 Technical Requirements for TSD Facilities

(1) Category A (On-site TSD facility)

Category A facilities must comply with the applicable technical requirements for the facility and operation of the facility as follows:

Type of facility	Applicable technical requirements for the facility and operation of the facility
A-1	Category B
A-2	Category C
A-3	Category E

(2) Category B (Off-site Incinerator)

1. Technical Requirements for Incinerators in Category B

Incinerators in Category B shall be designed, equipped, and built to meet the following requirements:

1.1 General Requirements

1.1.1 The incinerator has a structure or equipment to prevent dispersion and release of hazardous waste and odor.
1.1.2 Wastewater treatment facilities should be installed to meet the effluent standards as provided by DAO 90-35 and to be provided in the future.
1.1.3 Flue-gas treatment facilities should be installed to meet the emission standards as provided by Section 19 of CAA and to be provided in the future.
1.1.4 The waste acceptance area and the waste storage are provided for at least the following volume of waste:

Daily incineration capacity * number of days for which the facility is closed for periodical facility inspection * 2

1.2 Requirements for Incinerators B-1

1.2.1 The incinerator is equipped with a facility to continuously feed waste to the combustion chamber without any contact with open air.

1.2.2 The incinerator is equipped with the combustion chamber meeting the following conditions:

1.2.2.1 Waste is incinerated in the combustion chamber under the condition that the gas generating in the combustion chamber is at a temperature of 1,100 degrees Celsius or higher for B-1-1 and 850 degrees Celsius or higher for B-1-2.

1.2.2.2 At the outlet of the combustion chamber, the gas resulting from the process is raised to a temperature of 1,100 degrees Celsius for B-1-1 and 850 degrees Celsius for B-1-2 and remains in the secondary combustion zone for two seconds.

1.2.2.3 Each of the incineration plant is equipped with at least one (1) auxiliary burner. This burner must be switched on automatically when the temperature of the combustion gases after the last injection of combustion air falls below 1,100 degrees Celsius for B-1-1 and 850 degrees Celsius for B-1-2.

1.2.2.4 Six-nines (99.9999%) destruction and removal efficiency (DRE) is achieved for Polychlorinated Biphenyls (PCBs).

DRE: a measure of thermal conversion of a substance expressed in percent or in numbers of "nines," e.g., 99.99% = "4-nines."

$DRE = (W_{in}-W_{out})/W_{in} \times 100\%$

W_{in} = mass feed rate into incinerator (in waste)

W_{out} = mass feed rate out of incinerator (emissions/effluents)

1.2.3 The incinerator is equipped with devices to continuously measure and record CO concentration of the exhaust gas.

1.2.4 The combustion gas flowing into the precipitator is cooled down below 200 degrees Celsius, and the temperature of the combustion gas flowing into the precipitator is continuously measured and recorded.

1.2.5 Soot/dusts (fly ash) and bottom ash are separately taken out from the incinerator, and separately stored and treated without being scattered or released to the environment.

1.2.6 The incinerator is equipped with a facility to utilize energy generated from the incineration of hazardous waste as far as practical.

1.3 Requirements for Incinerators B-2

1.3.1 The incinerator is equipped with a facility to consecutively feed waste to the gasification chamber without any contact with open air.

1.3.2 The incinerator is equipped with the gasification facility that gasifies waste without any contact with open air.

1.3.3 The incinerator is equipped with the gas reforming facility that meets the following conditions:

1.3.3.1 The reforming facility can keep appropriate temperature and residence time for reforming. If the reforming facility combusts the gas, the reforming facility should meet the condition provided in 1.2.2.2.

1.3.3.2 The reforming facility is equipped with devices to prevent explosion.

1.3.4 The incinerator is equipped with a facility to oxidize the fixed carbon obtained through the gasification.

1.3.5 The incinerator is equipped with the facility to promptly cool down reformed gas or secondary combustion gas below 200 degrees Celsius, and the temperature of the reformed gas or the combustion gas flowing into the facility should be continuously measured and recorded.

1.3.6 The incinerator is equipped with a facility to utilize energy generated from the combustion of the gas generated as far as practical.

2. Technical Requirements for Operation of Incinerators

2.1 General Requirements

2.1.1 Wastes are weighed and analyzed upon acceptance at the premises to ensure that the premises accepts appropriate amount and types of the waste in accordance with its incineration and storage capacity.

2.1.2 The incinerator is periodically inspected for its function.

2.1.3 The incinerator is operated for consecutive twenty-four (24) hours except when the combustion chamber is inspected.

2.1.4 Ignition loss of the soot/dust and ashes is below 5%.

2.1.5 Infectious waste is placed straight in a furnace, without first being mixed with other categories of waste.

2.1.6 Amount of hazardous waste to be fed into the incinerator by waste code, volume of exhaust gas, amount of agents poured into the exhaust gas treatment facility, and amount of slag and dusts are measured and recorded on a daily basis.

2.1.7 The polychlorinated dibenzo-para-dioxin (PCDD) and polychlorinated dibenzofuran (PCDF) concentration of wastewater from the cleaning of exhaust gas is below 10pg/l when the incinerator is equipped with the exhaust gas treatment facility.

2.1.8 PCDD/F concentration of ashes from the precipitator or bottom of the incinerator is below 3ng/g.

2.1.9 The concentrations of emission standard parameters in exhaust gas are measured and recorded at the frequency provided by CAA. PCDD/F concentration in exhaust gas is measured and recorded once a year.

2.1.10 Fly ash and bottom ash are separately handled.

2.2 Technical Requirements for Operation of Incinerators B-1

Incinerators in Category B-1 shall be operated in such a manner that:

2.1.1 The temperature of the combustion gas in the combustion chamber is kept at 1,100 degrees Celsius or higher for B-1-1 and 850 degrees Celsius or higher for B-1-2. The temperature is continuously measured and recorded.

2.1.2 The CO concentration of exhaust gas is kept below 100ppm. The concentration is continuously measured and recorded.

2.1.3 The temperature of gas at the outlet of gas cooling facility is kept below 200 degrees Celsius. The temperature is continuously measured and recorded.

2.3 Technical Requirements for Operation of Incinerators B-2

Incinerators in Category B-2 shall be operated in such a manner that:

2.3.1 Gasification time is controlled in accordance with the quantity and types of wastes fed into the incinerator.

2.3.2 The temperature inside the gasification chamber is kept at the level necessary for gasification of waste. The temperature is continuously measured and recorded.

2.3.3 The temperature of synthesis gas flowing into the gas treatment facility is kept below 200 degrees Celsius. The temperature is continuously measured and recorded.

(3) Category C (Landfill)

1. Technical Requirements for Landfills

1.1 Landfill Site Selection

Landfills in Category C shall not be sited in the following area:

1.1.1 An area inundated by one in one hundred years of flood frequency

1.1.2 A region subject to potential or natural disasters, such as landslides, volcanic activities, earthquakes, and active faults

1.1.3 An important groundwater recharge area that has been designated as protection area

1.1.4 An area within the distance of 500 meters from a permanent river, lake, or dam used for drinking water supply or agricultural irrigation

1.1.5 An area having soil layer with thickness of less than 4 meters above an aquifer

1.1.6 An area designated for environmental protection and other public interests

1.2 Landfill Design

Landfills in Category C shall be designed and built in such a manner that:

1.2.1 Fences are built around the landfill site.

1.2.2 Retaining walls and/or dams, which withstand against the weight of inert hazardous waste residues, soil pressure, wave force, and earthquakes, are built to prevent accidental waste releases to the surrounding environment.

1.2.3 Drainage system to prevent rainwater from running into the facility is constructed.
1.2.4 Leachate collection system and its management system including the detention pond to control amount and quality of leachate are installed.
1.2.5 The liner, which is made from HDPE (high density polyethylene) with minimum thickness of 1.5 mm, is installed on the clay layer with thickness of 50 cm and the permeability coefficient of less than 10^{-6} cm/second. Otherwise, other lining system having the same function as above is installed.
1.2.6 A facility to protect the liner mentioned in 1.2.5 is installed.
1.2.7 Civil engineering work to prevent land subsidence is done as needed.
1.2.8 Leak detection system for the liner is installed.
1.2.9 Two monitoring wells are installed; one is near the boundary of the landfill area towards the down stream of groundwater, and the other is on the edge of the landfill premises.

2. Technical Requirements for Operation of Landfills

2.1 Prohibited waste in landfills

Any of the following hazardous wastes shall not be disposed of into landfills in Category C:

2.1.1 Liquid waste
2.1.2 Reactive chemicals (E 501, E502, E503 and E 599 in Table 1)
2.1.3 Containers previously containing toxic chemical substances (J201 in Table 1)
2.1.4 Pathogenic and infectious wastes (M501 in Table 1)
2.1.5 Friable asbestos wastes (M502 in Table 1)
2.1.6 Waste pharmaceuticals and drugs (M503 in Table 1)
2.1.7 Waste pesticides (M504 and M505 in Table 1)
2.1.8 Wastes not meeting the waste acceptance criteria for landfills provided in 2.2

2.2 Waste acceptance criteria for landfills

Landfills in Category C shall accept only the inert hazardous wastes residues that satisfy the following waste acceptance criteria for landfills.

Waste Acceptance Criteria for Landfills

Item/Substance	Value/Concentration
Ignition Loss	≦ 5 %
Total of organically bound carbon TOC (as C)	≦ 5 %
Moisture contents	≦ 85 %
pH (in eluate)	6.0 ≦ pH ≦ 9.0
Arsenic (as As)	≦ 0.3 mg/l*
Lead (as Pb)	≦ 0.3 mg/l*
Cadmium (as Cd)	≦ 0.1 mg/l*
Chrome, hexavalent (as Cr)	≦ 1.5 mg/l*
Mercury (as Hg)	≦ 0.01 mg/l*
Cyanide, easily releasable (as CN)	≦ 0.7 mg/l*

Item/Substance	Value/Concentration
Boron (as B)	≦ 9.0 mg/l*
Selenium	≦ 0.3 mg/l*
PCBs	≦ 0.003 mg/l*
Dioxins and Furans	≦ 3 ng/g

*The value indicates concentration of the substance in eluate; the measurement method is provided by the EMB.

2.3 Operational requirements for Landfills

Landfills in Category C shall be operated in such a manner that:

2.3.1 The amount of inert hazardous waste residues landfilled is recorded by waste residue type.

2.3.2 Eluate of inert hazardous waste residues is tested by waste residue type once a month, and its results are recorded.

2.3.3 Take appropriate measures for protecting the liner facilities from breakage (deposit hazardous waste residues in a manner not damaging the liner).

2.3.4 The liner and the detention leader head are daily inspected, and its results are recorded.

2.3.5 Before the commencement of operation of the landfill, the parameters for drinking water standards, electric conductivity, and chloride ion concentration of groundwater shall be measured and recorded. After the commencement of the operation, parameters for drinking water standards are measured and recorded once a year, and electric conductivity and chloride ion concentration are measured and recorded once a day. If any abnormality compared to the baseline data is observed in electric conductivity or chloride ion concentration, parameters for drinking water are measured and recorded. If degradation of groundwater quality is observed, the owner or operator of the landfill shall notify EMB, investigate the causes, and take necessary remedial actions.

2.3.6 Collected leachate is periodically analyzed. When the leachate is discharged into public water, it shall meet the effluent standards provided by DAO 90-35 and measured and recorded for the effluent standard parameters as provided by DAO 90-35. Electric conductivity and chloride ion concentration are measured and recorded every day. If the controlled leachate does not meet the effluent standards, the owner or operator of the landfill shall notify EMB, investigate the causes, and take necessary remedial actions.

2.3.7 Necessary actions such as covering the landfilled area by liner sheet are taken in order to prevent rainwater from permeating the inert hazardous waste residues landfilled until the final cover is installed.

3. Technical Requirements for Closure of Landfills

The landfill in Category C shall meet the following conditions upon its closure:

3.1 The landfill facility is not damaged.
3.2 After the landfill is fully filled with inert hazardous waste residues, it should be covered with earth having a minimum thickness of 50 cm and planted with local species.
3.3 The results of the groundwater quality monitoring show that no degradation of the groundwater has occurred.
3.4 Collected leachate is measured every six (6) months, and the leachate quality meets the effluent standards during the past two (2) years before the closure.

4. Technical Requirements for Post-Closure of Landfills

The landfill in Category C shall be maintained as follows for thirty (30) years after its closure:

4.1 Conditions of the landfill facility are monitored periodically, and necessary actions are taken if any damage is observed.
4.2 A permit is secured from EMB in a manner approved by EMB for any civil engineering works that mix the landfilled inert hazardous waste residues.
4.3 Electric conductivity and chloride ion concentration of groundwater and collected leachate are measured and recorded once a year.

(4) Category D (Recycling and Reprocessing Facilities)

1. Technical Requirements for Recycling and Reprocessing Facilities

Facilities in Category D shall be designed, equipped, and built to meet the following requirements:

1.1 The facility has a structure or equipment to prevent dispersion and release of hazardous waste and odor.
1.2 Effluent from the facility meets the effluent standards as provided by DAO 90-35.
1.3 Exhaust gas from the facility meets the emission standards as provided by Section 19 of CAA.
1.4 The waste acceptance area and the waste storage are provided for at least the following volume of waste:

Daily processing capacity * number of days for which the facility is closed for periodical facility inspection * 2

1.5 The facility has a closed structure to prevent leakage of hazardous substances.
1.6 Requirements provided in "1.1 General Requirements under 1. Technical Requirements for Incinerators in Category B" are met if the facility has a thermal process.
1.7 Facilities to store residues from the process are installed if the residues are generated.

2. Technical Requirements for Operation of Recycling and Reprocessing Facilities

Facilities in Category D shall be operated in such a manner that:

2.1 Wastes are weighed and analyzed upon their acceptance at the facility to ensure that the facility accepts appropriate amount and types of the wastes in accordance with its recycling or reprocessing and storage capacities.
2.2 The facility is periodically inspected for its function.
2.3 A facility operation plan is prepared and implemented.

2.4 Effluent from the facility meets the effluent standards as provided by DAO 90-35. Monitoring items and frequency are subject to the abovementioned IRR.

2.5 Exhaust gas from the facility meets the emission standards as provided by Section 19 of CAA. Monitoring items and frequency are subject to the abovementioned law and relevant IRR.

(5) Category E (Other treatment facilities)

1. Technical Requirements for Other Treatment Facilities

Facilities in Category E shall be designed, built, and equipped in such a manner that:

1.1 General Requirements

1.1.1 The facility has a structure or equipment to prevent dispersion and release of hazardous waste and odor.

1.1.2 Effluent from the facility meets the effluent standards as provided by DAO 90-35.

1.1.3 Exhaust gas from the facility, if it has a thermal process, meets the emission standards as provided by Section 19 of CAA.

1.1.4 The waste acceptance area and the waste storage are provided for at least the following volume of waste:

Daily treatment capacity * number of days for which the facility is closed for periodical facility inspection * 2

1.1.5 The facility has a closed structure to prevent leakage of hazardous substances.

1.1.6 Requirements provided in "1.1 General Requirements under 1. Technical Requirements for Incinerators in Category B" are met if the facility has a thermal process.

1.1.7 Facilities to store residues from the process are installed if the residues are generated.

1.2 Specific Requirements for Facilities to Detoxify Cyanide by Oxidization

1.2.1 Waste acid, waste alkali, oxidizer, and neutralizer are stored in separate tanks, and their supply to a reaction chamber can be controlled.

1.2.2 Toxic gases that may be generated through oxidative decomposition and other relevant processes are treated and not emitted into the environment.

1.2.3 Solid and liquid are separated, and residues and wastewater are properly treated.

1.3 Specific Requirements for Facilities to Detoxify Cyanide by Thermal Destruction

Facilities to detoxify cyanide by thermal destruction shall be designed, built, and equipped in such a manner that:

1.3.1 Exhaust gas is treated so as to meet the emission standards provided by Section 19 of CAA.

1.3.2 The temperature at the outlet of the decomposition chamber is kept at 900 degrees Celsius.

1.3.3 An auxiliary burner is equipped to keep the temperature in the destruction chamber at 900 degrees Celsius or higher.
1.3.4 Volume of air supply to the decomposition chamber is controllable.
1.3.5 Residues are properly treated.

1.4 Specific Requirements for Facilities to Detoxify Acid, such as Nitric, Nitrous and Chromic Acid, and to Neutralize Acid and Alkali Waste Liquid
1.4.1 Waste acid, waste alkali, reducing agent, and neutralizer are stored in separate tanks, and their supply to a reaction chamber can be controlled.

1.5 Specific Requirements for Facilities to Decompose Waste PCB and Its Treated Residues by Dechlorination
1.5.1 The facility has a structure or equipment to prevent release of waste PCB and its treated residues, and the floor or ground on which the structure or equipment is located is constructed of or covered by materials that waste PCB and its treated residues do not permeate into.
1.5.2 The facility is equipped with a reaction chamber that can mix waste and chemicals and control the temperature of the mixture so as for the reaction to proceed and that has a device to continuously measure and record the temperature of the mixture during the reaction.
1.5.3 The facility is equipped with devices to control supply volume of waste PCB, its treated residues, and chemicals.

1.6 Specific Requirements for Facilities to Decompose Waste PCB, Its Treated Residues, and Waste Containing PCB (hereinafter referred to as Waste PCBs) by Supercritical Water Oxidation
1.6.1 The facility has a structure or equipment to prevent release of waste PCBs, and the floor or ground on which the structure or equipment is located is constructed of or covered by materials that waste PCBs do not permeate into.
1.6.2 The facility has a reaction chamber that meets the following requirements:
1.6.2.1 The reaction chamber can withstand high temperature and pressure and be resistant to corrosion.
1.6.2.2 The reaction chamber is equipped with temperature and pressure controllers that can increase and keep high temperature and pressure inside the reaction chamber necessary for supercritical water oxidation.
1.6.2.3 The reaction chamber is equipped with a device to continuously measure and record temperature and pressure of the mixture.
1.6.3 The facility is equipped with devices to control supply volume of waste PCBs and oxidizers.

1.6.4 The facility is equipped with devices to cool down and decompress the mixture of waste and oxidizers after the reaction and separate gas from liquid in the mixture.

1.7 Specific Requirements for Facilities to Decompose Waste PCBs by Gas Phase Chemical Reduction

1.7.1 The facility has a structure or equipment to prevent release of waste PCBs, and the floor or ground on which the structure or equipment is located is constructed of or covered by materials that waste PCBs do not permeate into.

1.7.2 The facility has equipment to feed a certain amount of waste PCBs continuously without contact with open air.

1.7.3 The facility has a reaction chamber that meets the following requirements:

1.7.3.1 The reaction chamber can withstand high temperature and pressure and be resistant to corrosion.

1.7.3.2 The reaction chamber is equipped with temperature and pressure controllers that can increase and keep high temperature, pressure, and residence time necessary for the gas phase chemical reduction process and that can control supply volume of the gas used as agent.

1.7.3.3 Inside of the reaction chamber has no contact with open air.

1.7.3.4 The reaction chamber is equipped with a feeder of the gas used as agent.

1.7.3.5 The reaction chamber is safe from explosion.

1.7.3.6 The reaction chamber is equipped with devices to continuously measure and record temperature and pressure of the inside of the reaction chamber and supply volume of the gas used as agent.

1.7.4 The facility is equipped with devices that can remove particulate matters and hydrogen chloride in the synthesis gas from the reaction chamber and that can measure and record major components of the synthesis gas.

1.7.5 The facility is equipped with a device to prevent release of gas from the reaction chamber in case of emergency.

1.7.6 The facility is equipped with devices to take out and store particulate matters.

1.8 Specific Requirements for Facilities to Decompose Waste PCB and Its Treated Residues by UV Photolysis

1.8.1 The facility has a structure or equipment to prevent release of waste PCB and its treated residues, and the floor or ground on which the structure or equipment is located is constructed of or covered by materials that waste PCB and its treated residues do not permeate into.

1.8.2 The facility has a reaction chamber that meets the following requirements:

1.8.2.1 The reaction chamber is equipped with a device to mix waste and chemicals and a device to control

temperature of the mixture so that the reaction can proceed.

1.8.2.2 The reaction chamber is equipped with lumps that can apply ultraviolet irradiation necessary for the reaction.

1.8.2.3 The reaction chamber is equipped with devices to continuously measure and record temperature of the mixture.

1.8.3 The facility is equipped with devices to control supply volume of waste PCB, its treated residues, and agents.

1.9 Specific Requirements for Facilities to Separate and Collect PCB from Waste

1.9.1 The facility has a structure or equipment to prevent release of waste PCB and its treated residues, and the floor or ground on which the structure or equipment is located is constructed of or covered by materials that waste PCB and its treated residues do not permeate into.

1.9.2 The facility is equipped with a separator that meets the following requirements:

1.9.2.1 The separator is equipped with devices to increase and keep temperature and pressure inside of the separator necessary for separation.

1.9.2.2 The separator is equipped with devices to continuously measure and record temperature and pressure inside of the separator.

1.9.3 The facility is equipped with a collector that meets the following requirements:

1.9.3.1 The collector is equipped with devices to increase and keep temperature of the separated PCB so that the PCB is collected inside of the collector.

1.9.3.2 The collector is equipped with devices to continuously measure and record temperature inside of the collector.

1.9.4 The facility is equipped with devices to take out and store residues generated during the separation and the collection of PCB without release of the residues to the environment.

1.10 Specific Requirements for Facilities to Solidify Waste Asbestos by Melting

1.6.1 The facility is equipped with a furnace that can keep the temperature at 1,500℃ or higher and melt waste asbestos.

1.11 Specific Requirements for Facilities to Solidify Waste to Immobilize Toxic Substances in the Waste

1.7.1 The facility is equipped with a mixing tank that can uniformly mix wastes and agents.

2. Technical Requirements for Operation of Facilities in Category E

Facilities in Category E shall be operated in such a manner that:

2.1 General Requirements for Operation of Facilities in Category E

2.1.1 Wastes are weighed and analyzed upon their acceptance at the premises to ensure that the facility accepts the appropriate amounts and types of the waste in accordance with its treatment and storage capacity.

2.1.2 The facility is periodically inspected for its function.

2.2 Specific Requirements for Operation of Facilities to Detoxify Cyanide by Oxidization

2.2.1 pH value in the reaction chamber is measured, and supply volumes of hazardous waste, oxidizer, and neutralizer are properly controlled.

2.2.2 Hazardous waste, oxidizer, and neutralizer are mixed well, and the reaction time is controlled.

2.2.3 It is ensured that the exhaust gas treatment facility is running when oxidation is in operation.

2.2.4 Residues generated through the oxidation process are properly treated.

2.2.5 Wastewater generated through the oxidation process is treated so as to meet the effluent standards provided by DAO 90-35 when it is discharged outside the premises.

2.3 Specific Requirements for Operation of Facilities to Detoxify Cyanide by Thermal Destruction

2.3.1 Exhaust gas is treated so as to meet the emission standards and measured as provided by CAA.

2.3.2 The facility is operated so as to keep a temperature at the outlet of the decomposition chamber at 900 degrees Celsius or higher. The temperature is continuously measured and recorded.

2.3.3 Residues generated through the thermal process are properly treated.

2.4 Specific Requirements for Operation of Facilities to Detoxify Acid, such as Nitric, Nitrous and Chromic Acid, and to Neutralize Acid and Alkali Waste Liquid

2.4.1 pH value in the reaction chamber is measured, and supply volumes of hazardous waste, reducing agent, and neutralizer are properly controlled.

2.4.2 Hazardous waste, reducing agent, and neutralizer are mixed well, and the reaction time is controlled.

2.4.3 Residues generated through the process are properly treated.

2.4.4 Wastewater generated through the process is treated so as to meet the effluent standards provided by DAO 90-35 when it is discharged outside the premises.

2.5 Specific Requirements for Operation of Facilities to Decompose Waste PCB and Its Treated Residues by Dechlorination

2.5.1 Banks or other structure to prevent release of waste PCB and its treated residues is periodically inspected.

2.5.2 Agents are fed in accordance with the quantity and characteristics of the waste PCB and its treated residues.
2.5.3 Waste PCB, its treated residues, and agents are well mixed and the temperature of the mixture is kept at that required for the reaction.
2.5.4 The temperature of the mixture during the reaction is continuously measured and recorded.

2.6 Specific Requirements for Facilities to Decompose Waste PCB, Its Treated Residues, and Waste Containing PCB (hereinafter referred to as waste PCBs) by Supercritical Water Oxidation
2.6.1 Banks or other structure to prevent release of waste PCBs is periodically inspected.
2.6.2 Agents are fed in accordance with the quantity and characteristics of the waste PCBs.
2.6.3 Waste PCBs are fed into the reaction chamber after the temperature and pressure inside the chamber reach the level sufficient for the reaction by heating and compressing water and oxidizer inside the chamber, and the temperature and the pressure are kept at the appropriate level.
2.6.4 The temperature of the mixture and the pressure inside the reaction chamber are continuously measured and recorded.

2.7 Specific Requirements for Facilities to Decompose Waste PCBs by Gas Phase Chemical Reduction
2.7.1 Banks or other structure to prevent release of waste PCBs is periodically inspected.
2.7.2 Agents are fed in accordance with the quantity and characteristics of the waste PCBs.
2.7.3 Waste PCBs are fed into the reaction chamber after the temperature and pressure inside the chamber reach the level sufficient for the decomposition of waste PCBs, and the temperature, the pressure, and the supply volume of gas used as agent are kept at the appropriate level.
2.7.4 The temperature and pressure inside the reaction chamber and the supply volume of gas used as agent are continuously measured and recorded.

2.8 Specific Requirements for Facilities to Decompose Waste PCB and Its Treated Residues by UV Photolysis
2.8.1 Banks or other structure to prevent release of waste PCB and its treated residues is periodically inspected.
2.8.2 Agents are fed in accordance with the quantity and characteristics of the waste PCB and its treated residues.
2.8.3 Ultraviolet irradiation volume is kept at the level necessary for the photolysis process.
2.8.4 Intensity of ultraviolet radiation is periodically measured and recorded.
2.8.5 The temperature of the mixture is continuously measured and recorded during the reaction.

2.9 Specific Requirements for Facilities to Separate and Collect PCB from Waste

2.9.1 Banks or other structure to prevent release of waste contaminated with PCB is periodically inspected.

2.9.2 Separator operation time is controlled in accordance with quantity and types of waste contaminated with PCB.

2.9.3 The temperature and pressure inside of the separator are kept at the level necessary for separation.

2.9.4 The temperature and pressure inside of the separator are continuously measured and recorded.

2.9.5 Quantity of the liquid waste generated after the separation and the collection of PCB is measured and recorded.

2.10 Specific Requirements for Operation of Facilities to Solidify Waste Asbestos by Melting

2.10.1 The temperature inside the melting chamber is kept at 1,500 degrees Celsius or higher, and the temperature is measured and recorded.

2.11 Specific Requirements for Operation of Facilities to Solidify Waste to Immobilize Toxic Substances in the Waste

2.11.1 Liquid separated from hazardous waste is not discharged into the environment.

2.11.2 Treated waste goes through aging before being landfilled.

(6) Category F (Storage Facilities)

1. Technical Requirements for the Storage in Category F

The storage in Category F shall be designed, built, and equipped in such a manner that:

1.1 General Requirements

1.1.1 Fences are installed around the storage area.

1.1.2 A signboard, which indicates that the area is designated as storage for hazardous waste, category and sub-category of hazardous waste stored, and name and contact address of waste treatment manager at the premises, with minimum size of 60cm x 60cm, is posted in a prominent place.

1.1.3 If contaminated water is generated at the premises, drainage and other system are installed in order to prevent surface and ground water pollution from the contaminated water, and the floor of the storage area is covered with impermeable materials.

1.1.4 Hazardous waste is not released from the storage area.

1.1.5 Odor is not generated from hazardous waste at the premises.

1.2 Special Requirements for Built Tanks

1.2.1 The tanks should be built of materials compatible with hazardous waste to be stored in the tanks.

1.2.2 The tanks should be equipped with leak detection system.

1.2.3 The tanks should be surrounded by dikes with drainage to collection pits.

1.2.4 The area surrounded by dikes should be waterproof and have minimum capacity of 120% of maximum capacity of tanks.

1.2.5 The space between the tanks and the dikes should be larger than the height of the tanks, and so should be the space between the tanks. (so that if a tank falls down, the tank should remain within the area surrounded by the dikes and not fall on other tanks)

2. Technical Requirements for Operation of the Storage in Category F

The storage in Category F shall be operated in such a manner that:

2.1 Segregation of hazardous waste by generation source

Hazardous wastes transported to the storage should be stored in a manner that containers, tanks, or vessels are grouped by generator. The hazardous wastes shall not be mixed because the said conduct is regarded as pre-treatment of the hazardous waste.

2.2 Inspection

The storage in Category F shall be inspected for the following items once a day:

2.1.1 Detection of corrosion or other deterioration of the materials used for vessels, containers, or tanks

2.1.2 Detection of spills or leaks from vessels, containers, or tanks

2.3 Reporting

The waste treater operating the storage in Category F shall submit a stored waste treatment plan to DENR/EMB on February 1st and July 1st of every year. The stored waste treatment plan contains the following items:

2.2.1 Quantity of hazardous waste accepted during the past six months (January to June, or July to December) by waste type

2.2.2 Quantity of hazardous waste treated, recycled, reprocessed, or disposed of at the TSD facility during the past six months

2.2.3 Plan on the treatment of hazardous waste in the storage

12.2 Preparation of Procedural Manual for Hazardous Waste Management

12.2.1 Objectives of the Procedural Manual

Based on RA6969, DAO 92-29, and other relevant laws and regulations, the Procedural Manual is designed to serve as a primary reference for the DENR staff or personnel, existing and prospective waste generators, transporters, and treaters, environmental units of government agencies, local government officials, non-governmental or people's organization, and other stakeholders in the smooth implementation of proper hazardous waste management. It aims to clarify the definition of hazardous waste and provide technical standards and requirements for hazardous waste generators, transporters, and premises involved in the treatment, storage, recycle, reprocess, and disposal of hazardous wastes in the country.

12.2.2 Preparation Process of the Procedural Manual

The JICA Study Team and EMB has prepared a draft Procedural Manual as shown in Annex 6 based on inputs from the followings parties:

Date	Occasion	Topic
November 2002	Informal meetings with Hazardous Waste Management Section (HWMS), EMB	Structure and preparation process of the Procedural Manual
November 29, 2002	The first editorial committee within EMB	Structure and preparation process of the Procedural Manual
February 2002	Informal meetings with HWMS, EMB	Contents of the first draft Procedural Manual
June 3 – 18, 2002	Five seminars on Hazardous Waste Management for DENR Regional Office staff	Technical requirements of TSD facilities Procedures for issuing TSD facility permit
June 21, 2002	Seminar on Update of RA6969 for mainly waste generators	Draft classification of hazardous waste
September 3, 2002	The second editorial committee within EMB	Draft classification of hazardous waste
September 9, 2002	The third editorial committee within EMB (one-day workshop)	Draft classification of hazardous waste
September 11, 2002	Inter Agency Technical Advisory Committee (IATAC) meeting	Draft classification of hazardous waste
September 16, 2002	Seminar on Hazardous Waste Management for DENR Regional Office staff	Draft classification of hazardous waste
September 18, 2002	Seminar on RA6969 for stakeholders other than DENR Regional Office staff (industry, other government organization, and academe)	Draft classification of hazardous waste Technical Requirements of TSD facilities

EMB has requested the DENR Regional Office staff and the participants of the seminar on RA 6969 held on September 18, 2002 to submit further comments and uploaded the draft Procedural Manual to its homepage for public comments. The comments are due on October 7, 2002, and the JICA Study Team and EMB will consider these comments in finalization of the draft Procedural Manual. After the discussion at the IATAC meeting, the Secretary of DENR will authorize the draft Procedural Manual.

12.2.3 Organization of the Procedural Manual

The draft Procedural Manual has the following structure:

Preface

Introduction
- Hazardous waste management in the Philippines
- Legal framework of hazardous waste management
- Purpose of the Procedural Manual
- Overview of the Procedural Manual
- Definition of terms

Chapter 1 Policy
- 1-1 Import of recyclable hazardous waste
- 1-2 Landfill of inert hazardous waste residues
- 1-3 Financial responsibility of waste generators

Chapter 2 Classification of Hazardous Waste
- 2-1 Definition of hazardous wastes
- 2-2 Policy to classify hazardous waste
- 2-3 Revised Table 1

Chapter 3 Waste Generators
- 3-1 Requirements for hazardous waste generators
- 3-2 Waste generator registration
  - (1) Initial waste generator registration
  - (2) Procedure for waste generator registration
  - (3) Supplemental waste generator registration
- 3-3 Reporting requirements
  - (1) Reporting Items
  - (2) Reporting procedure
- 3-4 Requirements for proper hazardous waste management
  - (1) Designation of hazardous waste management supervisor
  - (2) Compliance with storage requirements
  - (3) Compliance with pre-transport requirements
  - (4) Use of authorized transporters
  - (5) Compliance with transport record system
  - (6) Use of authorized treaters
  - (7) Confirmation of completion of treatment/disposal
  - (8) Hazardous waste minimization, reuse, recycling planning
- 3-5 Emergency contingency planning
- 3-6 Personnel training
  - (1) Training requirements
  - (2) Reporting requirements

Chapter 4 Waste Transporters
- 4-1 Requirements for waste transporters
- 4-2 Waste transporter registration

Chapter 13

Manual on Compliance Monitoring for Hazardous Waste Management

13 MANUAL ON COMPLIANCE MONITORING FOR HAZARDOUS WASTE MANAGEMENT

13.1 Objectives of the Manual

This manual aims to help staffs of the DENR/EMB Regional Offices and the EMB Central Office who are in charge of compliance monitoring related to RA6969 and DAO 92-29. Section 8 of DAO 92-29 states that the Secretary of DENR may appoint and deputize officers and delegate following his powers to the officers:

> conduct inspection of nay premises in which hazardous wastes are being generated, stored, processed, reprocessed, recycled, treated and/or disposed of and make recommendations to the proper authorities; and
>
> stop, detain, inspect, examine and remove to some suitable place for inspection and examination any vehicle or boat that is believed to being or likely to be used for the transport of chemical substances and hazardous and nuclear wastes subject to pertinent provisions of these Rules and Regulations;

This manual covers basics of compliance monitoring for HWM based on the above provision prepared by the JICA Study Team, and EMB is expected to revise the manual as it acquires experiences of compliance monitoring.

13.2 Objectives of Compliance Monitoring

Compliance monitoring is carried out to ensure proper management of hazardous waste by waste generators, transporters and treaters and monitor illegal dumping. When inappropriate practice is observed, the authority offers guidance on proper management of hazardous waste.

13.3 Definition of Proper Management of Hazardous Waste

Proper management of hazardous waste means that waste generators, transporters and treaters, which are stipulated in DAO 92-29, manage, store, transport, treat, and dispose hazardous waste in compliance with the responsibilities and the requirements based upon RA6969 and DAO 92-29.

13.3.1 Responsibilities and Requirements of Waste Generators

Responsibilities and requirements of HW generators are stipulated in Sections 24, 26, 27, 28, 29, and 30 of DAO 92-29.

Section 24 Policy

2. The Department encourages proper management of hazardous wastes generated within the country by promoting, in order of preference:
   a. minimization of the generation of hazardous waste;
   b. recycling and reuse of hazardous waste;

c. treatment of hazardous waste to render it harmless; and
d. landfill of inert hazardous waste residues.

3. Hazardous waste shall be managed in such a manner as not to cause or potentially cause:
   a. pollution;
   b. state of danger to public, health, welfare and safety;
   c. harm to animals, bird, wildlife, fish or other aquatic life;
   d. harm to plants and vegetation; or
   e. limitation in the beneficial use of a segment of the environment.
4. **The waste generator** shall be responsible for the proper management and disposal of the hazardous waste.
5. **The waste generator** shall bear the costs for the proper storage, treatment and disposal of their hazardous waste.

Section 26 Waste Generator

1. **All waste generators** shall:
   a. notify the Department of the type and quantity of wastes generated
   b. provide the Department a quarterly report
2. **A waste generator** shall continue to own and be responsible for the hazardous waste generated or produced in the premises until the hazardous waste has been certified by the waste treater as had been treated, recycled, reprocessed or disposed of.
3. **A waste generator** shall prepare and submit to the Department comprehensive emergency contingency plans
4. **A waste generator** shall be responsible for training its personnel and staff on:
   a. the implementation of the plan required under Section 26 (3); and
   b. the hazard posed by the improper handling, storage, transport, and use of chemical substances and their containers.

Section 27 Waste Transporter

4. **A waste generator** shall only use waste transporters duly authorized by the Department to transport hazardous wastes.

Section 28 Waste Transport Record

2. Prior to the transport of hazardous wastes, **the waste generator** shall complete, in duplicate, portions that refer to the waste generator in the prescribed form and shall submit the same to the Department accompanied by payment of the prescribed fee.
3. **The waste generator** shall retain and store a copy of the waste transport record for a period of twenty-four (24) months from the date of receipt of Department.

Section 29 Hazardous Waste Storage and Labelling

1. Vessels, containers and tanks for the storage of hazardous waste shall be clearly labelled and this labelling shall comprise the following particulars:
2. The labelling of the vessels, containers and tanks specified in Section 29 (1) shall be conspicuously marked in paint, decals or other permanent form of markings.

Section 30 Waste Treatment and Disposal Premises

1. No waste treater shall accept, store, treat, recycle, reprocess or dispose of hazardous wastes unless done in the premises as prescribed in Table 3 and permitted by the Department.

13.3.2 Responsibilities and Requirements of Waste Transporters

Responsibilities and requirements of HW transporters are stipulated in Sections 27 and 28 of DAO 92-29.

Section 27 Waste Transporter

1. **No transport of hazardous waste** shall be allowed unless prior permit is secured from the Department.
2. Any application for the issuance or amendment of a permit to transport hazardous waste shall be made in accordance with the form and in a manner approved by the Department and accompanied by a payment of the prescribed fee.

Section 28 Waste Transport Record

4. Prior to the transport of the hazardous waste, **the waste transporter** shall complete, in duplicate, portions referring to the waste transporter in the prescribed form.
5. **The waste transporter** shall place a copy of the waste transport record in the driver's cabin of the waste transport vehicle.
6. Upon arrival at the waste treatment, storage, recycling, reprocessing, processing or disposal premises, **the waste transporter** shall give a copy of the waste transport record to the waste treater.
11. Any **waste transporter** while transporting hazardous waste is involved in an accident which results in the spillage or release of the hazardous waste to the environment shall immediately contain the spillage and notify the Department.

13.3.3 Responsibilities and Requirements of Waste Treaters

Responsibilities and requirements of HW treaters are stipulated in Sections 28, 29, and 30 of DAO 92-29.

Section 28 Waste Transport Record

7. Upon receiving a waste transport record, **the waste treater** shall:
   a. verify the accuracy of the waste description of the hazardous waste;
   b. complete portions of the waste treater on the waste transport record; and
   c. retain and store the complete waste transport record for a period of twenty-four months after receipt of the hazardous waste.
8. If the hazardous waste data is inaccurate **the waste treater** shall immediately inform the waste generator of such inaccuracy within a reasonable period of time. **The waste treater** shall have the right to deny acceptance of such hazardous waste if such acceptance may cause any danger or hazard in the operation of its premises;
9. If the hazardous waste is accepted by the **waste treater** for treatment, storage, export, recycling, reprocessing, processing or disposal, **the waste treater** shall certify in writing, the acceptance of the hazardous waste to the waste generator.

10. **The waste treater** shall send to the Department within 5 days, the certification required under Section 28 (9) copy furnished the waste generator.

Section 29 Hazardous Waste Storage and Labelling

1. Vessels, containers and tanks for the storage of hazardous waste shall be clearly labelled and this labelling shall comprise the following particulars:
2. The labelling of the vessels, containers and tanks specified in Section 29(1) shall be conspicuously marked in paint, decals or other permanent form of markings.

Section 30 Waste Treatment and Disposal Premises

1. **No waste treater** shall accept, store, treat, recycle, reprocess or dispose of hazardous wastes unless done in the premises as prescribed in Table 3 and permitted by the Department.
2. An application for issuance or amendment of a permit under this section shall be made in accordance with a form and in a manner approved by the Department accompanied with the payment of the prescribed fee **and accompanied by such plans, specifications and other information and a summary thereof as may be required by the Department.**

Treaters also should comply with technical requirements of TSD facilities as provided in the Procedural Manual for HWM based on RA 6969 and relevant laws and regulations and conditions attached to the TSD facility permit to operate.

13.4 Objectives and Forms of Compliance Monitoring

Compliance monitoring takes four forms as follows: 1) document check at offices, 2) on-site surveys of relevant parties, 3) on-site inspections of relevant parties, and 4) monitoring of illegal dumping.

13.4.1 Document Check at Offices

Document check at offices is carried out to confirm whether registration of and quarterly reporting from generators, transporters and treaters, manifests, transport permits, are properly conducted. When DENR/EMB finds out improper documentations or actions of generators, transporters and treaters, it instructs them on corrective actions, which would increase their awareness towards importance of regulatory compliance.

13.4.2 On-site Survey

On-site survey should be distinguished from inspection. On-site survey should be carried out with consent of the facility that you plan to visit. This work aims to gather relevant information concerning HWM from the facility and give pressures to a manager of the facility so that he or she feels they are being observed.

13.4.3 On-site Inspection

On-site inspection is carried out to find out whether or not 1) submitted documents such as registration forms and quarterly reports reflect the reality, and 2) a generator,

a transporter, or a treater complies with relevant laws and regulations. When DENR/EMB finds out improper actions of generators, transporters and treaters, it instructs them on corrective actions, which would increase their awareness towards importance of regulatory compliance.

13.4.4 Monitoring of Illegal Dumping

This work aims to prevent environmental damages due to illegal dumping by early detection and stoppage of illegal dumping, and prevent illegal dumping itself.

13.5 Preparatory Work for Compliance Monitoring

13.5.1 Preparation of Individual Files

The DENR/EMB Regional Offices and the EMB central office should create individual files of generators, transporters and treaters prior to initiating the work. All materials concerning each relevant body, which includes registration form, quarterly reports, transport records, records of on-site survey and inspection, etc., should be bound together into the file.

13.5.2 Staff Assignment and Their Responsibility

Each Director of the DENR/EMB Regional Offices and the EMB central office should appoint one staff per region who supervises compliance monitoring work and necessary staffs who carry out the monitoring work. Each Director should allocate human and financial resources to conduct the monitoring work in light of regional conditions, such as number of generators and treaters.

13.5.3 Compliance Monitoring Implementation Plan

The DENR/EMB Regional Offices should formulate an annual implementation plan on compliance monitoring for the next fiscal year during the end of the fiscal year. A format of the plan is described as follows.

	Target	Required Days	Required # of Staff	Budget	Achievement
Document check at the Office	4 times				
On-site Survey	20 premises				
On-site Inspection	20 premises				
Illegal Dumping Patrol	10 times				

The regional offices evaluate annual achievement of the previous 4 quarters and prepare a report on that by the end of November every year. Then the regional offices formulate and submit the annual implementation plan on compliance monitoring for the next fiscal year to the EMB central office by the end of the fiscal year.

13.6 Document Check at Offices

The work consists of a) document check and instruction at time of registration, b) periodical check of regulatory compliance after registration, and c) identification of non-registered generators and instructions to them.

13.6.1 Work concerning waste generator registration

(1) Work at time of registration

(When a waste generator submits the registration form and accompanying documents to the EMB Regional Offices)

a) Confirmation of whether the information in the notification form and accompanying documents are appropriate

b) Issuance of DENR ID number

c) Guidance on duties and requirements of the waste generator

DENR/EMB should guide a newly registered generator on the following items.

- Guidance on the need for registration as waste transporter if waste generators wish to transport their own hazardous waste to the facilities off-site
- Guidance on the necessity to secure a Transport Permit prior to transport of hazardous waste
- Guidance on the necessity to secure a TSD facility Permit if a waste generator wishes to store their own hazardous waste off-site, treat, or dispose of the waste at the waste generator's premises
- Guidance on the reporting requirement on a quarterly basis
- Explanation of the need for compliance with the waste transport record (manifest) system
- Guidance on the preparation and submission of an emergency contingency plan
- Guidance on the preparation and submission of a hazardous waste 3R plan

(2) Work concerning registered waste generators

DENR/EMB Regional Offices should conduct the following works regarding registered generators:

a) Input of information in the registration form and accompanying documents into the database on waste generators

b) Confirmation of compliance with reporting requirements and guidance to the waste generators failing to the requirements

c) Listing priority targets for compliance monitoring

DENR/EMB Regional Offices should prepare a form to check performance of generators. The check sheet below makes it easier to identify generators who do not comply with their requirements. DENR/EMB staff shall inform them about their administrative violations and identify them as targets for compliance monitoring. Among the administrative violators, DENR/EMB shall select those whose activities are likely to have major environmental impacts as primary targets for compliance monitoring such as on-site survey and inspection.

Name of Generator	ID	Quarterly Reports[1)]				Manifests[2)]			Evaluation
		1/4	2/4	3/4	4/4	No.	From Generator	From Treater	
GMA Corp.	GR10-10-9999	15/01	12/04	Not received	Not received	101	15/02/02	02/03/02	Bad
						102	15/06/02	Not received	

Note:
1) Fill in the date of Quarterly Report received.
2) Fill in the manifest number and the dates of manifests received from the generator and designated treater in the column.

(3) Work concerning unregistered waste generators

a) Identification of unregistered generators
Compared a list of facilities with ECC and a list of registered generators, identify those listed in the former but not in the latter, and then narrow them down as potential generators taking type of facility into account.

b) Guidance on the registration requirements for those who generate or produce hazardous waste
DENR/EMB Regional Office should prioritize certain types of industries that have higher potential to generate hazardous waste, and inform corresponding companies of registration requirements as HW generators though relevant industrial associations. It would appear that metalworking industry, electric and electronic appliances manufacturing industry, automobile industry, electroplating industry, chemical industry, and medical institutions should be prioritized.
(Note: DENR/EMB Regional Offices are encouraged to provide PCOs with information regarding hazardous waste management through seminars.)

13.6.2 Work concerning registration of waste transporters

(1) Work at time of registration

a) Scrutiny of whether the applicant is appropriate as waste transporter authorized by DENR

b) Explanation of the necessity of compliance with the waste transport record system

c) Explanation of the necessity of preparation and implementation of an emergency contingency plan

d) Issuance of a waste transporter license with DENR ID number

(2) Work concerning registered waste transporters

a) Preparation and maintenance of a register of waste transporters

13.6.3 Work concerning registration of waste treaters

(1) Work at time of registration

a) Scrutiny of whether the applicant is qualified as waste treater

b) Explanation of the necessity of compliance with the waste transport record system

(2) Work after registration

a) Preparation and maintenance of a register of waste treaters

b) Check on compliance with manifest and reporting requirements

A treater shall submit a manifest after receiving HW at the TSD facility to the DENR/EMB Regional Office having jurisdiction over the location of the generator who contracted with the treater according to Section 28.10 of DAO 92-29. In addition, if DENR/EMB requires the treater to submit a report on the operation as one of the conditions attached to the TSD facility Permit to Operate issued by DENR/EMB, its submission should be also checked. When DENR/EMB finds treater's administrative violation against the manifest and reporting requirements, it should notify the treater of its violation and require him/her to comply with the requirements.

13.7 On-site Survey

On-site survey should be obviously distinguished from inspections. On-site survey is conducted through visiting generators and TSD facilities to gather necessary information regarding creation and amendment of regulations and guidelines and policy making. DENR/EMB Regional Offices should receive consent from relevant bodies prior to visits to their premises. Therefore, even if DENR/EMB finds improper actions at the premises by on-site survey, it cannot impose administrative sanction. It is not necessary for DENR staffs who conduct the on-site survey to obtain authorization from Secretary of the Department in order to enter the premises.

13.8 On-site Inspections

13.8.1 Objective

Inspections are carried out with the aim of confirming that targeted parties appropriately manage and treat hazardous waste based on the law, confirmation is based on relevant requirements and standards.

13.8.2 Outline of Check Items

Most important item to be confirmed during the inspection is whether a generator, transporter or treater complies with duties and requirements stipulated in laws and regulations. In addition, it includes observing corrective actions taken by the target body in response to the administrative guidance, and environmental impacts on the surrounding environment from storage, recycling and treatment of hazardous waste.

(1) Waste generators

a) Confirmation of whether the realty is consistent with the information in the notification form and accompanying documents

b) Confirmation of efforts to minimize generation, reuse and recycling of hazardous waste

c) Confirmation of whether hazardous waste is properly treated (when hazardous waste is treat off-site, confirmation of whether the contract with waste treaters on the treatment is appropriate)

d) Confirmation of the person in charge of hazardous waste management

e) Confirmation of submission of quarterly reports to the DENR/EMB Regional Office

f) Confirmation of filing manifests

g) Confirmation of whether filing and preservation of related documents are appropriate

(2) Waste transporters

a) Confirmation of whether the realty is consistent with the information in the registration form and accompanying documents

b) Confirmation of whether transport of hazardous waste is carried out properly

c) Confirmation of filing manifests

d) Confirmation of whether filing and keeping related documents are appropriate

(3) Waste treaters

a) Confirmation of compliance of treatment facilities with the requirements for and conditions of permission

b) Confirmation that treatment facilities are operated properly (if technical standards are not established for treatment facilities, it is necessary to prepare provisional internal check items)

c) Confirmation of filing manifests

d) Confirmation of whether filing and keeping related documents are appropriate

13.8.3 Preparation of an inspection plan

(1) Timing of plan preparation

Prepare the annual inspection plan at the beginning of the fiscal year.

(2) Revision of the plan

Initial inspection plan should be revised according to actual situation even if it is on its way.

(3) Inspection plan for waste generators

Since limited time and resources are available for carrying out inspections, it is necessary to develop an inspection plan with priority.

When selecting target facilities for inspection, it is desirable to give priority to the following items:

a) Facilities that generate or handle a large amount of hazardous waste
b) Facilities where new regulations are applied
c) Facilities that received administrative guidance or disposition during the previous year
d) Facilities where necessity of improvements was pointed out in the past inspections
e) Facilities where numerous complaints are raised by nearby residents
f) Facilities that are linked to hazardous waste targeted for special attention by the EMB

The EMB shall conduct periodical inspection of the generators that it considers close monitoring is necessary about once every two to three years.

Facilities that meet any of the followings shall be given to less priority for inspection even if the facilities fall under the above priority facilities.

a) Facilities that were deemed excellent establishments in the preceding inspection
b) Facilities that have acquired an ISO 14001 certification
c) Facilities that have developed their own hazardous waste management standards and report on management conditions to the EMB without any failure

(4) Inspection plan for waste transporters

Waste transporters who handles larger amount of hazardous wastes should be given a priority for inspection.

(5) Inspection plan for waste treaters

All the off-site TSD facilities are subject to the annual inspection; inspections of on-site TSD facilities are integrated into those of generators.

13.8.4 Preparation for Inspections

Obtain prior to the inspection understanding of the following items as far as possible.

(1) Waste generators

a) Address and internal layout of facilities
b) Production processes and the processes through which hazardous wastes are generated
c) Reporting performance
d) If a treatment facility exists within the premises, the facility type (storage, intermediate treatment, final disposal, recycling, etc.) and outline (type and capacity, etc. of facilities)
e) Results of the past inspections
f) Guidance given to the facility in the past (contents of administrative disposition, etc.)
g) Existence of complaints from nearby residents

(2) Transporters

a) Address of the office
b) Information provided in the registration form and accompanying documents
c) Results of the past inspections
d) Guidance given to the facility in the past (contents of administrative disposition, etc.)
e) Existence of complaints from nearby residents

(3) Waste treaters

a) Address and layout of the facilities
b) Type of treatment facilities (storage, intermediate treatment, final disposal, recycling, etc.) and outline (type and capacity, etc. of facilities)
c) Results of the past inspections
d) Guidance given to the facility in the past (contents of administrative disposition, etc.)
e) Existence of complaints from nearby residents

13.8.5 Implementation of Inspections and Check Items

(1) Basics of inspections

a) As a rule, inspections shall be implemented without prior notice to the facilities to be inspected.
b) A team of at least two members including an environmental protection inspector shall carry out inspections.

c) When conducting inspections, inspectors shall carry their identification cards and shall announce the objective of the inspection and their status as inspectors.

d) Inspections shall be implemented in the presence of personnel responsible for hazardous waste management or PCO.

e) Upon conducting inspections, inspectors shall bring inspection sheets and the information collected in advance with them and fill in the sheets on site.

f) When inspectors found items requiring corrective actions, they shall inform the target parties in writing rather than oral notification. Moreover, inspectors shall give instructions on the items requiring corrective actions and specify deadlines for the action where possible.

g) Samples of target waste, groundwater and discharge from the facility shall be obtained where necessary.

(2) Preparation of check sheets for inspections

Each DENR/EMB Regional Office will prepare check sheets for inspection prior to implementation. There are six sheets in Attachment as reference.

a) Inspection Sheet for Waste Generators (Format 1)
b) Inspection Sheet for Waste Transporters (Format 2)
c) Inspection Sheet for Waste Treaters (Format 3)

Three check sheets will be utilized for an inspection of TSD facilities. These formats are prepared to check whether a treater follows technical requirements including operation conditions prescribed in Chapter 7 of the Hazardous Waste Management Procedural Manual of DAO 92-29.

d) Inspection format for treatment facility (Format 4)
e) Inspection format for landfill facility (Format 5)
f) Inspection format fro storage facility (Format 6)

(3) Check items in the inspection of waste generators

a) Consistency of the information in the notification form and accompanying documents with the actual conditions

b) Efforts made to minimize generation, reuse, and recycling of hazardous waste

c) Storage conditions of hazardous waste:

   (a) Storage conditions (storage containers, storage height, scattering or release of hazardous waste)

   (b) Categorization of the stored wastes

   (c) Display of a signboard as the storage site

   (d) Odor (impact on surrounding area)

   (e) Sanitary conditions

d) If the waste generator has a treatment facility, items applicable to waste treaters described later

e) If treatment of hazardous waste is commissioned to waste treaters:
   (a) Contract documents
   (b) Compliance with the manifest system
   (c) Transport slips and records
   (d) Necessary document preparation at times of accidents during transport
f) Designation of personnel in charge of hazardous waste management
g) Planning and implementation of staff trainings
h) Filing and keeping relevant documents

(4) Check items in the inspection of waste transporters

a) Consistency of the information in the registration form and accompanying documents with the actual conditions (vehicles, driver employment conditions)
b) Contract documents and business records
c) Manifest use and filing conditions
d) Training of drivers on emergency response
e) Storage conditions of hazardous waste:
   (a) Storage conditions (storage containers, storage height, scattering or release of hazardous waste)
   (b) Categorization of the stored wastes
   (c) Display of a signboard as the storage site
   (d) Odor (impact on surrounding area)
   (e) Sanitary conditions
f) Use of sub-contractors
g) Filing and keeping relevant documents

(5) Check items in the inspection of waste treaters

a) Common items
   (a) Display of signboard as hazardous waste treatment facility (location, activity, etc.)
   (b) Fences (breakages of the fences)
   (c) Gates (conditions of the lock, breakages of the gates)
   (d) Display of permits
   (e) Contract documents
   (f) Acceptance slips and business records
   (g) Manifest filing conditions
   (h) Odor (impact on the surrounding area)
   (i) Scattering or release of hazardous waste
   (j) Rainwater drainage

(k) Firefighting equipment (installed sites, maintenance conditions)

(l) Vehicle washing equipment (installed sites, maintenance conditions)

(m) Roads used for transport of hazardous waste (dirt, damage, etc.)

(n) Existence of complaints from nearby residents and responses to those

(o) When conditions are attached to the Permit to Operate, their compliance

b) Inspection items for transshipment and storage facilities

Same as the items for storage conditions for inspections of waste generators as described above

c) Inspection items for treatment, recycling, and reprocessing facilities

(a) Operating conditions of facilities (treated quantities, operating hours, treated waste types)

(b) Emission management

(c) Effluent management

(d) Noise, vibration and dust generation conditions and their countermeasures

d) Inspection items for landfills

(a) Structure of the landfill

(b) Types of inert hazardous waste residues landfilled

(b) Landfill conditions (total amount of waste disposed, remaining landfill capacity, intermediate earth coverage conditions)

(c) Existence of changes in landfill facilities

(d) Operating conditions of wastewater treatment facilities (maintenance conditions, discharged water quality)

(e) Leachate sampling equipment (observation wells, etc.)

13.8.6 Works after Inspections

(1) Administrative Guidance

If it is confirmed that improvement activities are necessary during the inspection, the inspectors shall require the responsible parties to prepare and submit improvement plans and monitor and confirm implementation of the plans.

(2) Administrative Violations

Section 41 of DAO 92-29 provides four administrative violations regarding hazardous waste products as follows:

a) Violations of notification and quarterly reporting requirements by waste generators

b) Violations of securing a permit or authorization requirement by waste transporters and waste treaters

c) Violations of labeling requirements

d) Violations of subpoena or subpoena duces tecum requirement

(3) Penalties and Instruction for Violation

In the case of lesser violation of the requirement stipulated in DAO 92-29 and the Procedural Manual for Hazardous Waste Management, giving an instruction on activities for the improvement, which is addressed in 13.8.6.1 of this manual, to a violator would be enough if the violator is likely to follow the guidance.

In the case of greater degree violation of the requirement and if there is a major risk of environmental impacts due to the violation, DENR/EMB shall send an invitation to the potential violator to a technical conference. If the potential violator fails to convince DENR that environmental management measures will be instituted and compliance is attained, DENR will issue a notice of violation and with continuous non-compliance, a Cease and Desist Order (CDO) as well. If there is immediate threat to life and property, the DENR may issue outright a Cease and Desist Order (CDO). If there is pollution arising from the violation, the case is forwarded to the Pollution Adjudication Board for quasi-judicial resolution. A Cease and Desist Order may be lifted only by the Pollution Adjudication Board.

13.9 Monitoring of Illegal Dumping

13.9.1 Objective

Monitoring of illegal dumping of hazardous waste aims to discover and stop illegal dumping at earlier stage, identify those who conduced illegal dumping, and recover illegal dumping sites.

13.9.2 Patrol

(1) Patrollers

A team of at least two members carrying their identification cards shall conduct patrols.

(2) Regular patrols

Patrol schedules shall be prepared and implemented regularly.

(3) Patrols based on complaints, etc.

Patrollers shall take necessary actions so as not to make those who filed a complaint or reported information about the illegal dumping be harmed or harassed by those who conducted illegal dumping when patrols are conducted based on the complaints or notifications.

13.9.3 Tasks at illegal dumping sites

(1) When those who conducted illegal dumping are on site

If a backhoe operator or dump truck driver is actually present at the illegal dumping site, patrollers shall ask his/her name and address after identifying themselves. The patrollers shall take pictures of the illegal dumping site and record a vehicle number. Where necessary, they shall take samples of the waste illegally dumped. Requiring responsible parties to report to the authority shall be done in writing.

(2) When those who conducted illegal dumping are not on site

Patrollers shall take pictures of the site, check for any items that may prove useful in identifying those who conducted illegal dumping, and where necessary, take samples of the waste illegally dumped.

13.9.4 Work at the Office

(1) Record preparation

When an illegal dumping site is found during a patrol, a record of guidance shall be prepared within that day. It is desirable to prepare a record of guidance for each case so that a history of the guidance is clearly described.

(2) Summons and issuance of a notice of violation

DENR/EMB shall send an invitation to the potential violator to a technical conference. If the potential violator fails to convince DENR that environmental management measures will be instituted and compliance is attained, DENR will issue a notice of violation and with continuous non-compliance, a Cease and Desist Order (CDO) as well.

13.9.5 Handling of cases difficult to be solved by administrative measures

If those who conducted illegal dumping are malicious, and if it is difficult for the EMB to solve the situation by itself, the EMB considers prosecuting the responsible parties for their conduct. If the illegal dumping causes pollution of the dumpsite (such as the land parcel) and the receiving bodies of water and air, the illegal dumping is considered as criminal offenses under Sections 8 and 9b of PD 984.

13.9.6 Handling of cases that may render a serious environmental risk or damages to human health

(1) When those who conducted illegal dumping or those who generated the hazardous waste illegally dumped are identified

As described in 18.6.3, if there is pollution arising from the violation, the case is forwarded to the Pollution Adjudication Board for quasi-judicial resolution. A Cease and Desist Order may be lifted only by the Pollution Adjudication Board.

(2) When those who conducted illegal dumping or those who generated the hazardous waste illegally dumped are not identified

Site restoration to be carried out by the EMB in place of the responsible parties shall be examined.

13.9.7 Considerations

Monitoring of illegal dumping should be carried out in conjunction with enhancement of relevant organizations since realization of administrative guidance and recovery of the dumping site require considerable amount of time and efforts after the detection of illegal dumping.

13.10 Attachment

Form 1: Inspection Sheet (for Waste Generators)

Inspection date: / / (day/month/year) Inspectors:

Name of waste generator		(ID:)	
Name of PCO			
Name of contact person other than PCO (who witnessed inspection)			
Address			
Industrial sector, main products, raw materials			
Type and quantity of hazardous waste generated			
Done by waste generator	Transportation	(Yes/No) If yes, use the inspection sheet for transporters	
	Treatment	(Yes/No) If yes, use the inspection sheet for waste treaters	
Storage	Storage method		
	Stored amount		
	Stored days		
	Fulfillment of the technical requirements (Hazardous wastes are stored in storage facilities. There is no scattering, release or infiltration of hazardous waste, and no leak of odor.)		
	Rats do not inhabit storage facilities, and there are no outbreaks of insects such as mosquitoes and flies.		
	A sign as storage site for hazardous waste is appropriately displayed.		
	Storage containers, etc. are appropriately labeled.		
Contract	Type and quantity of hazardous waste to be treated by designated waste treater		
	Waste Transporter	(ID:)	
	Waste treater	(ID:)	
	The waste transporter has a valid license and is capable to transport the designated hazardous waste.		
	The waste treater has a valid license and is capable to treat the designated hazardous waste.		
Quarterly reports have been submitted.			
Staff training has been carried out to properly respond to emergency conditions.			
Filing and keeping waste transport record (manifest) are appropriate.			
Hazardous waste 3R plan has been prepared.			
Other items to be noted			
Items requiring improvement			

Form 2: Inspection Sheet (for Waste Transporters)

Inspection date: / / (day/month/year) Inspectors:

Name of waste transporter		(ID:)	
Name of hazardous waste transport manager			
Address			
Number of officers			
Number of employees			
Type and quantity of hazardous waste handled			
Conveyances (vehicles, verges) and containers	Names and quantities		
	No risk to impose any scattering or release of hazardous waste, and leakage of odor.		
	Prepared with equipment necessary to respond to emergency conditions such as spillage of HW		
Storage	Storage method		
	Amount stored		
	Period stored (Confirm that storing period is less than thirty days.)		
	Fulfillment of the technical requirements (Hazardous wastes are stored in storage facilities. There is no scattering, release or infiltration of hazardous waste, and no leak of odor.)		
	Rats do not inhabit storage facilities, and there are no outbreaks of insects such as mosquitoes and flies.		
	A sign as storage site for hazardous waste is appropriately displayed.		
Sub-contract of transport	Name of sub-contractor		
	Type and quantity of hazardous waste		
	Sub-contractor has a valid waste transporter license and is capable to transport the designated hazardous waste.		
A valid Transport Permit has been obtained for each transport of hazardous waste.			
The contract with the waste generator is appropriate.			
The waste transporter conveys only permitted hazardous waste			
Filing and keeping of transportation record are appropriate.			
Treaters to which hazardous wastes are transported are authorized by DENR and appropriate to treat the wastes.			
Other items to be noted			
Items requiring improvement			

Form 3: Inspection Sheet (for Waste Treaters)

Inspection date: / / (day/month/year) Inspectors:

Name of waste treater		(ID:)
Name of PCO		
Address		
Issuance date of Permit to Operate		
Number of officers		
Number of employees		
Operating hours		
Treatment to make waste inert	Type of hazardous waste	
	Treatment method	
	Treated amount	
Landfilling	Type of hazardous waste	
	Landfill area	
	Landfill capacity	
	Amount landfilled	
	Remaining capacity	
	Landfill period	
Storage	Storage method	
	Amount stored	
	Period stored	
	In case of off-site storage facility, segregation of waste by generator (Confirm that waste is stored in the original container.)	
	Fulfillment of the technical requirements (Hazardous wastes are stored in storage facilities. There is no scattering, release or infiltration of hazardous waste, and no leak of odor.)	
	Rats do not inhabit storage facilities, and there are no outbreaks of insects such as mosquitoes and flies.	
	A sign as storage site for hazardous waste is appropriately displayed.	
Treatment facilities are enclosed by a fence and are displayed as sites where treatment of hazardous waste products is carried out.		
The contract with the waste generator is appropriate.		
Staff training has been carried out to properly respond to emergency conditions.		
Filing and keeping waste transport record (manifest) are appropriate.		
Other items to be noted		
Items requiring improvement		

Form 4: Inspection Sheet (for Treatment Facilities)

Inspection date: / / (day/month/year) Inspectors:

Name of installing party		(ID:)
Name of PCO		
Name of the contact person other than PCO who witnessed the inspection		
Address		
Common items	There are storage facilities that entail no scattering, release or infiltration of hazardous waste, and no risk of odor leakage.	
	The facilities are safe in terms of structural bearing capacity.	
	The facilities possess the registered capacity.	
	Amount of waste feed to the facilities does not exceed its treatment capacity.	
	Inspections and functional checks of facilities are carried out regularly.	
	Records of facility maintenance are prepared and stored.	
	There are no outbreaks of mosquitoes or flies, etc. and interior cleanliness is maintained.	
	There is no generation of extreme noise or vibration.	
Drainage	Wastewater treatment facilities are in normal operation.	
	Monitoring of effluent is carried out regularly.	
Runoff prevention	Floors and ground surfaces are constructed of and covered with impermeable materials.	
	Facilities to prevent spill of waste oil are equipped and inspected regularly.	
Incineration	Emission gas treatment facility is appropriate.	
	Regular monitoring of emissions is carried out, and monitoring items are appropriate.	
	Operation and maintenance of facilities is appropriate.	
	Fire prevention systems and firefighting equipment such as fire extinguishers, etc. are appropriate.	
Neutralization	Hydrogen ion concentration meters are used to appropriately control the supply flow.	
	Units for controlling the supply flow of neutralizing agent, and mixing units are appropriate.	
Solidification	Kneading equipment is appropriate; mixing is uniform; curing of mixture is sufficient.	
Roasting and decomposition	Gas treatment equipment is appropriate.	
	Regular monitoring of emissions is carried out, and monitoring items are appropriate.	
	The operating condition of facilities is appropriate.	
	Fire prevention systems and firefighting equipment such as fire extinguishers, etc. are appropriate.	
	Units for controlling the supply flow of oxidizing agent and neutralizing agent, and mixing units are appropriate, and mixing of oxidizing agent and neutralizing agent is sufficient.	
	Gases generated by oxide decomposition do not harm the nearby living environment.	
Management and disposal of treatment residues are properly conducted.		
Other items to be noted		
Items requiring improvement		

Form 5: Inspection Sheet (for Landfills)

Inspection date: / / (day/month/year) Inspectors:

Name of operator (waste treater)	
Name of PCO	
Name of contact person other than PCO who witnessed the inspection	
Address	

The landfill is equipped with bulldozers and other work equipment.	
A fence to prevent outsiders from entering encloses the site.	
A sign indicating that this is a landfill disposal site is clearly displayed at the entrance of the landfill.	
There is no scattering or release of hazardous waste or spread of odor from the site.	
Measures to prevent habitation of rats and outbreaks of mosquitoes and flies are taken.	
Pollution of public water bodies or groundwater resulting from leachate is not taking place.	
Appropriate works to prevent landslides and subsidence have been taken.	
Retaining walls and barriers, etc. are regularly inspected and there is no risk of damage.	
Liners are regularly inspected.	
Monitoring of groundwater quality around the site is regularly implemented.	
Monitoring items, frequency, and results of groundwater quality are appropriate.	
The site has open channels, etc. capable of stopping surface water from flowing into the site.	
Sand and sediment that accumulate in open channels are quickly removed.	
Water collection system is functioning properly.	
Leachate treatment equipment is properly maintained and regularly inspected.	
Discharge water is regularly inspected for its quality.	
Discharge water quality monitoring items, frequency, and analysis results are appropriate.	
Wastes landfilled are inert.	
Areas where wastes are landfilled are covered with earth (thickness of approximately 50 cm).	
Weighing and recording of incoming quantities of waste are appropriately carried out.	
Inspections of the quality of accepting waste are appropriate.	
Maintenance of access roads, in-site roads and maintenance roads is appropriate.	
Landfill maintenance records are taken and kept.	
Other items to be noted	
Items requiring improvement	

Form 6: Inspection Sheet (for Storage Facilities)

Inspection date: / / (day/month/year) Inspectors:

Name of operator (waste treater)		
Name of PCO		
Name of contact person other than the PCO who witnessed the inspection		
Address		
Types and amount of stored hazardous waste		
Storing days		
A fence to prevent outsiders from easily entering encloses the storage facilities.		
As a rule, there is one entry/exit, and the gate can be locked.		
A sign indicating that this is a landfill site is clearly displayed at the entrance.		
There is no scattering and release of waste or spread of odor from the storage facilities.		
Measures to prevent inhabitation of rats and outbreaks of mosquitoes and flies are taken.		
Partition walls are established to store hazardous waste by type (sub-category).		
Floors and ground surfaces, etc. are constructed of and covered with impermeable materials.		
The storage height of waste is no more than 2.0 m.		
The permitted storage capacity is not exceeded.		
Liquid waste is stored in the same containers that it is carried in by.		
Odorous waste is stored in closed storage facilities.		
Wastes for which indoor storage is desirable are stored indoors.		
The structure of storage facilities is such that rainwater, etc. does not enter from outside.		
Firefighting equipment such as fire extinguishers is installed (facilities where combustible waste are stored).		
Access roads are appropriate.		
Maintenance records of storage facilities are taken and kept.		
Other items to be noted		
Items requiring improvement		

Chapter 14

Seminars and Workshops on Hazardous Waste Management

14 SEMINARS AND WORKSHOPS ON HAZARDOUS WASTE MANAGEMENT

14.1 Seminars and Workshops for DENR/EMB Regional Office Staff and EMB Central Office Staff

14.1.1 Objectives of the Seminars and Workshops

The JICA Study Team and EMB/HWMS organized series of seminars to enhance hazardous waste management administration. The seminars aimed to orient DENR/EMB Regional Office staff, selected PENRO/CENRO staff, and EMB Central Office staff on the hazardous waste database management and implementation of relevant laws and regulations. The former is linked to the hazardous waste management database system developed during the Study; the latter focuses on laws, policies, rules and regulations regarding hazardous waste management. The seminars were also held as an opportunity to obtain DENR regional staff's inputs on the draft classification of hazardous waste, TSD facility permit procedures, and technical requirements for the TSD facilities.

14.1.2 Seminars on Operation of the HWM Database System

(1) Topics Covered

The JICA Study Team installed 3 computers in the Central Office and one each in the Region 3, 4 and NCR Offices within the CALABARZON area by the end of March 2002. Subsequently, the JICA Study Team installed computers in Regions 7 and 11 in September 2002.

To operate the HWM DB System on the computers networked by telephone line among these offices, the JICA Study Team organized workshops addressed to the staff of the offices in which the system was installed using the operation manual.

A member of the JICA Study team gave a lecture and training to the staffs of the MIS in the workshop held in September 2002, so that the EMB staffs would be able to expand registration by themselves.

(2) Schedule and Venue

The workshops were held as follows:

Date	Venue	Target Regions	# of Participants
7 - 8 March	EMB Central Office Canteen	Region 3, 4-A, NCR, EMB Central Office HWMS staff	10
22 May	Region 4-A Office	Region 4-A staff	3
24 May	NCR Office	NCR staff	3

Date	Venue	Target Regions	# of Participants
28 May	Region 3 Office	Region 3 staff	3
5 September	EMB Central Office	Central Office Management Information Section	3
6 September	EMB Central Office	Central Office HWMS staff	5
10 September	Region 7 Office	Region 7 staff	3 + 1*
12 - 13 September	Region 11 Office	Region 11 staff	3 + 1*

*Training on installation and setting of the system to MIS staff.

(3) Results of the Workshops

1) Workshop held on the 7th and 8th of March, 2002

The training on the theoretical framework of the database system was given on the first day and practical training on the second day.

A member of the JICA Study Team explained the distribution of the HW generators registered, the present situation of the region where the EMB staff participated serving in and the importance of the registration of enterprises concerned with HW. The process of registration using the DB System was explained, and all the participants recognized that registration services would be done in the regional office in which the system was introduced. The member emphasised that the accuracy of data in the registration form is indispensable to utilizing the DB System.

In the actual registration service done, the registration data submitted to the regional offices were sent to the Central Office without any checks and the Central Office gave the ID number. Therefore, the participants understood that the registration service would be changed drastically.

In the workshop held in the afternoon of the first day, a lecture on "what a computer is," "what can be done using a computer" and "basic knowledge of computers" was given by the system engineer of the JICA Study Team to make the EMB staff understand the rules to create the database before operation. It seems that this workshop was a chance to change the present usage of the computer, which is as a word processor. The participants understood the concept of data flow and data keeping through the explanation of the DB System and network given in this workshop.

The EMB staffs were trained in the operation method of the HWM DB System using the operation manual the JICA Study Team prepared and a laptop computer on the second day. The participants understood the general idea of how to operate the HWM DB System and what should they do in their offices.

2) Workshop held from the 22nd to 28th of May, 2002

When the system engineer reinstalled the DB System in the Region 3, 4A and NCR offices in the CALABARZON area, he trained the regional staff how to operate the

DB System. The regional staff learned a practical operation of the registration services using the equipment installed in their offices.

3) Workshop held from the 5th to 13th of September, 2002

The integrated training including system maintenance and operation for the EMB staffs in the Central Office were given in the workshop held in the last field study. The operational training for the regional staff was conducted based on the additional installation of the computers in the Region 7 (Cebu) and 11 (Davao) offices.

As the system management requires knowledge of not only the hardware but also the software for the computer network, training for system management was organized addressing the staff of the Management Information Section maintaining all the computers installed in the EMB in a lump. However, the member of the JICA Study Team had tried to transfer the technology regarding DB System establishment to the staff of MIS in the first and second field studies, and he trained the system setting to the MIS staff in the Region 7 and 11 offices in a practical manner.

It seems that the technical transfer to the staff of MIS was done sufficiently as the staff upgraded the OS and reinstalled the DB System updated to the region 3, 4A and NCR by themselves smoothly.

In spite of the fact that the member had given the operational training of the DB System to the staff of HWM, the system had not been used. The reason was the staff had not been authorized to start operation. However, the JICA Study Team encouraged them to start operation of the DB System. The JICA Study Team requested the EMB to submit the number of registrations summarized by region to the JICA Philippines Office quarterly to monitor the usage of the System, and the EMB agreed to it. The following table is the form of the quarterly report to be submitted to JICA by the EMB.

Date/Month/Year

Region No.	Name of Region	No of Registered GR	Rate(%)
1	Ilocos Region		
2	Cagayan Valley		
3	Central Luzon		
4	Southern Tagalog		
5	Bicol Region		
6	Western Visayas		
7	Central Visayas		
8	Eastern Visayas		
9	Western Mindanao		
10	Northern Mindanao		
11	Southern Mindanao		
12	Central Mindanao		
13	National Capital Region		
14	Cordillera Administration Region		
15	Autonomous Region of Muslim		
16	Caraga		
Total			

Name of EMB HWMS Staff

14.1.3 Seminars on Hazardous Waste Management (June 2002)

(1) Topics Covered

The following topics were covered at the seminars held in June 2002:

Topic	Relevant handouts
Overview of the Study on Hazardous Waste Management	
Overview and Updates of RA6969	RA6969
Overview of Title II of DAO 92-29 (toxic chemical substances)	DAO 92-29
Profile of Registered Generators and Potential Generators	List of potential generators by each region
Hazardous Waste Generators Identification, Registration and Reporting Procedures Hazardous Waste Transporters Registration and Permitting Procedures	Guideline for HW Registration as shown in Annex 8
Inspection Procedures of HW Generators, Treaters, Transporters and Illegal Dumping	Draft Compliance Monitoring Manual
TSD Facility Permitting and Registration Procedures	- Chapter 7 of the draft Procedural Manual on Hazardous Waste Management as shown in Annex 6 - Draft Memorandum Circular on Permitting Procedures for TSD facilities under RA 6969
Group Activity on the Following Topics: - Identification of Waste Generators - Role of Regional Offices in the Regulation of Hazardous Waste Generators and Transporters - Role of HW Generators - Role of HW Transporters - Role of Regional Offices in the Regulation of Hazardous Waste Treaters/Recyclers	Tasks assigned to each group is shown as "Workshop Mechanics" in Annex 10

The seminar programs are included in Annex 10.

(2) Schedule and Venue

The seminars were held for two days for each venue as follows:

Date	Venue	Target Regions	# of Participants	Host EMB Office/Reg. Director
3 – 4 June	Montebello Hotel, Cebu	Regions 6, 7, 8, 9	33	Region 7 / RD Bienvenido Lipayon
6 – 7 June	Marco Polo Hotel, Davao	Regions 10, 11, 12, 13, ARMM	35	Region 11 / RD Metodio Turbella
10 – 11 June	LIMA Technology Center, Lipa, Batangas	Regions 4, 5, Central Office	31	Region 4 / RD Ernesto Malimban
13 – 14 June	Century Imperial Palace Suites, Quezon	Region 3, NCR, Central Office	32	NCR / RD Sixto Tolentino Jr.
17 – 18 June	Fontana Leisure Parks, Clark	Region 1, CAR, Region 2	30	CAR / RD Frederic Villanueva

Total of 161 DENR/EMB staffs participated in the five seminars. Lists of the participants are provided in Annex 10.

(3) Results of the Seminars

The seminars were held for two days at each venue; on the first day presentations were given on overview of the Study on HWM and Title II of DAO 92-29 (toxic chemical substances), registration and reporting procedures for waste generators and transporters, inspection procedures, proposed technical requirements for TSD facilities. Some of the participants were not familiar with RA6969 and DAO 92-29; the topics were good enough to cover the items necessary for understanding overall framework of HWM in the Philippines.

There were many questions and comments from the participants on the proposed technical requirements for TSD facilities (see details in Annex 10). Many questions are related to what waste oils are categorized as hazardous waste and whether boilers burning waste oils and on-site wastewater treatment facilities for solution containing cyanide as TSD facilities. In addition, as a part of the group work, participants who are assigned to Group 5 proposed permitting procedures of TSD facilities. These concerns will be considered in the finalization of the draft Procedural Manual for HWM (see Chapter 12.2).

The main activity on the second day is a group work in order to deepen understandings of the participants about the topics presented during the first day of the seminar. The participants were divided into 5 groups, and each group was tasked to prepare answers or a proposal to the question prepared by the JICA Study Team and EMB/HWMS. The output from each group is summarized in Annex 10. The group work gave the participants an opportunity to understand and find a room for improvement of generator registration expansion strategies, waste generators and

transporters registration procedures, and TSD facility permitting procedures as their own tasks. Some of the groups proposed improvement of the registration forms and documentation requirements for permits. These comments are going to be considered in the finalization of the Procedural Manual for HWM (see Chapter 12.2).

14.1.4 Seminars on Hazardous Waste Management (September 2002)

(1) Topics Covered

The following topics were covered at the seminar held in September 2002:

Topic	Relevant handouts
Classification of Hazardous Waste	Draft Classification of Hazardous Waste and Supplementary Explanation as shown in Annex 5
Hazardous Waste Treatment Schemes	Treatment Scheme of HW as shown in Annex 5
Monitoring/Inspection of HW Generators, Treaters, Transporters	Compliance Monitoring Manual as described in Chapter 13
HW Database	-
Plan on Registration Expansion	Action Plan for Expansion of the HW Registration as shown in Annex 9
Group Activity on Plan on Registration Expansion	Tasks assigned to the participants are shown as "Workshop Mechanics" in Annex 10

The seminar program is included in Annex 11.

(2) Schedule and Venue

The seminar was held as follows:

Date	Venue	Target Regions	# of Participants
16 September	Sulo Hotel, Quezon	Staff from each DENR/EMB Regional Office in charge of HWM administration	48

Total of 48 staff participated in the seminar; the list of the participants is shown in Annex 11.

(3) Results of the Seminar

During the seminar, presentations were given on classification of HW, treatment scheme of HW, monitoring of HW generators, transporters, and treaters, framework of the HW database system, and the plan on registration expansion. Then, the participants worked on the preparation of HW generator registration expansion by DENR/EMB Regional Office.

There were many questions and comments on the draft classification of HW (see details in Annex 11). Major issue is how to categorize waste oil as HW. Some participants addressed that if there is a volume limit (200L of waste oil accumulated at one generator's premises), waste oil might be discharged little by little. Another concern about waste oil is whether waste vegetable oil should be categorized as HW if it exceeds the volume limit because it is usually used as additive to animal feeds. Helpful comments include necessity of harmonization with Chemical Control Order for the substances such as asbestos regarding the definition of the target substance. These comments and concerns are going to be integrated into the final draft of revised Table 1 of DAO 92-29 in the Procedural Manual for HWM.

The outputs from the group work on the preparation of HW generator registration expansion plan were also presented at the end of the seminar (see details in Annex 11). Progress of these plans is going to be monitored by the Planning Section of EMB.

(4) Evaluation of the Seminar

Out of the 48 participants, 22 filled the feedback form for the seminar (see Annex 11). Based on the feedback forms, about half of the respondents selected all the topics discussed during the seminar were useful to them. The highest ratio of respondents selected classification of the hazardous waste (77.3%), and the lowest plan on registration expansion (45.5%). The respondents also selected HW treatment technologies (95.5% of the respondents), HW minimization and recycling (54.5%), identification of HW (50%), and enforcement/violation/penalty (50%) for topics for which further seminars are necessary. Although the treatment scheme of HW was introduced during the seminar, it was generic in nature. Since the DENR regional staffs are expected to be in charge of issuing TSD facility permits in the future and conducting compliance monitoring, they feel strong need to have knowledge of HW treatment technologies to judge the appropriateness of TSD facilities and treatment practices of waste treaters.

Out of the 22 respondents, five participants selected organizational arrangement for enforcement should have been addressed during the seminar. Since the compliance monitoring was introduced to the participants as one of the tasks carried out by DENR/EMB Regional Offices, EMB should promptly establish proper arrangement for implementing the compliance monitoring.

14.2 Seminars for HWM Stakeholders

14.2.1 Objectives of the Seminars

The JICA Study Team and EMB/HWMS organized two seminars to update HWM stakeholders with recent development of HWM administration and consult with them about the draft classification of HW and technical requirements for TSD facilities. The recent development includes adoption of new registration forms, the supreme court's ruling on the interpretation of the ban on incineration in CAA, issuance of Memorandum Circular on interpretation of the ban on incineration in CAA. The seminar aims to provide PCOs with working knowledge on RA6969 and its IRR, understand the requirements for HW generators and learn what and how to comply with the law and regulations.

14.2.2 Seminar on Update of RA6969 (June 2002)

(1) Topics Covered

The following topics were covered at the seminar held in June 2002:

Topic	Relevant handouts
Identification of Hazardous Waste	Draft Classification of Hazardous Waste as shown in Annex 5
Transport Permit and Manifest Proper Documentation and Reporting by HW Stakeholders	New/revised EMB forms for HW Registration (as shown in Annex 8), Transport Permit application, TSD Premises Permit application
CAA and Incineration	-
Technologies Employed at Model HW Treatment Facility	-

The seminar program is included in Annex 12.

(2) Schedule and Venue

The seminar was held as follows:

Date	Venue	Target Participants	# of Participants
21 June	Old Swiss Inn, Makati	HW Generators (PCOs)	101

The list of the participants is shown in Annex 12.

(3) Results of the Seminar

Presentations were given on the preliminary draft of revised Table 1 of DAO 92-29, procedures of registrations and transport permits and relevant reporting, CAA and incineration, and technologies employed at the MIF project. Among the questions and comments from the participants (see details in Annex 12), major topic was on the classification of HW. Because the draft classification of HW was at the preliminary stage, and because the draft was delivered on the day of the seminar, most of the questions are on whether waste generated at their premises are categorized as HW. There were several comments on the signatory of the manifest (waste transport record); formal designation of PCO as the signatory by DENR was requested.

The participants were able to obtain the latest information on HWM administration such as new prescribed forms for registration and reporting and the interpretation of the *Ban on Incineration* close in CAA. In addition, they were informed of the commencement of revision of Table 1 of DAO 92-29 (classification of HW). It is expected that industry associations and individual companies will start discussion on the draft classification of HW within their organizations.

(4) Evaluation of the Seminar

Out of the 101 participants, 39 filled the feedback form for the seminar (see Annex 12 for detailed results). Based on the feedback forms, more than half of the respondents selected all the topics except technologies employed at model HW treatment facility discussed during the seminar were useful to them. The highest ratio of respondents selected classification of the hazardous waste (69.2%), and the lowest technologies employed at model HW treatment facility (30.8%). More than half of the respondents (51.3%) also selected relevant laws and regulations, HW minimization, HW recycling for topics for which further seminars are necessary.

Out of the 39 respondents, five participants selected laws and regulations, and waste treatment technology and service as the items on which they would like to have more information. Although all the environmental laws and regulations can be downloadable from the EMB home page, there still needs information dissemination on the laws and information because not all the companies have access to Internet. In addition, not all the laws have detailed implementing rules and regulations, interpretation and supplementary explanation of the relevant laws and regulations may be necessary for those who are regulated.

14.2.3 Seminar on RA6969 (September 2002)

(1) Topics Covered

The following topics were covered at the seminar held in September 2002:

Topic	Relevant handouts
Classification of Hazardous Waste	Draft Classification of Hazardous Waste as shown in Annex 5

Topic	Relevant handouts
TSD facilities	Chapter 7 of the draft Procedural Manual for Hazardous Waste Management as shown in Annex 6, with supplementary explanation for major requirements
Leaching Methods and Characterization of Hazardous Waste Residues	-
Overview of MIF project	-
CAA and Incineration	-

The seminar program is included in Annex 13.

(2) Schedule and Venue

The seminar was held as follows:

Date	Venue	Target Participants	# of Participants
18 September	Sulo Hotel, Quezon	HW Generators (PCOs)	116

The list of the participants is shown in Annex 13.

(3) Results of the Seminar

The presentations during the seminar covered topics of draft classification of HW, draft technical requirements for TSD facilities, leaching test methods, overview of MIF, and DENR's response to the interpretation of the ban on incineration close in CAA in the supreme court ruling. There were many questions and comments raised during the open forum sessions (see details in Annex 13); major focus was on the draft classification of HW. Because the revision of Table 1 of DAO 92-29 was announced as in progress at the former seminar (June 21, 2002), and because the draft was distributed to major industry associations in advance, there were not only questions but also constructive comments from the participants. As for waste oils, the draft classification proposes the volume limit based on the accumulative volume of the waste (200L of waste oil accumulated at one generator's premises); the participants were asked to make a comment on the threshold of the volume limit by the end of September. It was also pointed out that characteristics of waste oils should be considered in categorizing them as HW. In addition, it was identified that it is necessary to clarify where the line in drawn between promotion of HW recycling and proper HWM.

The draft classification of HW proposes concentration standards of hazardous substances in eluate; the procedure of eluate preparation is described on the handout. Dr. Peralta's presentation on the leaching test methods provided comprehensive information on various test methods. These have initiated the discussion on what

test methods the Philippines is going to adopt as the standard methods for identifying hazardous substances in the waste.

Comments on the draft classification of HW and technical requirements for TSD facilities were described on the feedback form for the seminar (see Annex 13); further comments are requested in writing by the end of September. In addition, EMB promised to upload the draft Procedural Manual for HWM on its Homepage and ask for comments from the general public. The seminar initiated the discussion on enhancement of HWM in the Philippines with industry and academe.

(4) Evaluation of the Seminar

Out of the 116 participants, 36 filled the feedback form for the seminar (see Annex 13 for detailed results). Based on the feedback forms, more than half of the respondents selected all the topics except overview of the MIF project discussed during the seminar were useful to them. The highest ratio of respondents selected classification of the hazardous waste (88.9%), and the lowest overview of the MIF project (44.4%). More than half of the respondents also selected HW treatment technology (72.2%), HW recycling (61.1%), and identification of HW (58.3%) for topics for which further seminars are necessary.

Some of the respondents suggested that the seminar would have been better if handouts had been provided for all the presentations and if the open forum had been facilitated properly.

Chapter 15

Recommendations

15 RECOMMENDATIONS

The JICA Study Team has been working on the feasibility study on the MIF construction project and development of technical requirements for RA6969 and DAO 92-29 and capacity building of the staffs of the EMB central office and the DENR regional offices. These activities are just a one step to enhance the HWM administration in the Philippines. The JICA Study Team expects the Philippine government (DENR/EMB) by itself will continue the efforts to enhance the HWM administration. The issues regarding HWM in the Philippines identified during the Study and challenges that DENR/EMB will face are summarized below.

15.1 Development of HW Treatment Facilities

- The policy on HWM in DAO 92-29 (Section 24, Chapter VII, Title III) provides that HW should be treated to be inert hazardous waste residues and disposed in landfills unless they can be recycled or reused. It is necessary to have facilities to treat organic HW to be inert HW residues and dispose of the residues in order to implement the policy. The JICA Study Team developed the basic design of the MIF and examined the feasibility of the MIF construction project with the involvement of the GOP. It is the GOP's responsibility to prepare necessary local counterpart funds and take procedures for the construction of the MIF such as approving ICC, obtaining ECC, and confirming social acceptability.
- The MIF is going to be located in CALABARZON, and its planned treatment capacity is about 40,000 ton/year, which can treat only a part of the HW generated in CALABARZON. It is necessary to develop measures and construct facilities to store HW both generated in other areas and generated in CALABARZON but cannot be treated by the MIF as proceeding with the MIF construction project.

15.2 Laws and Regulations

- The framework of the HWM has been established by the issuance of DAO 92-29, the implementing rules and regulations of RA6969. However, procedures and technical requirements necessary for implementing the HWM have not officially adopted, which is one of the factors that prevent private investments in construction of HW treatment facilities. Since DENR/EMB is preparing the Procedural Manual for HWM (DAO 92-29), the prompt authorization of the Procedural Manual is important.
- The Procedural Manual includes the HW judgement criteria and waste acceptance criteria for landfills. Official measurement and analysis methods for hazardous substances in the HW should be adopted in order to implement these criteria.
- Although the JICA Study Team has prepared materials that have supplemental explanation to the draft classification of HW and technical requirements for TSD

facilities, it is desirable if the government officials, industry, academe, NGO, and other interested parties collaborate to further detail the explanation. This kind of activity would increase public concern over HWM and provide useful information for the amendments and development of laws and regulations regarding HWM in the future.

15.3 Organization, Human Resources, and Administrative Operation

- Responsibility of implementing RA6969 and DAO 92-29 is given to the Secretary of DENR. Since the Secretary has a various responsibilities, it takes time to approve regulations and other administrative matters necessary for HWM administration. Section 9 of DAO 92-29 provides that the Secretary may, by notice, amend or revoke the delegated authorities previously granted under Section 8 (2) of these Rules and Regulations and appointment of an Environmental Protection Officer. It is recommended to appoint EMB Director as the Environmental Protection Officer so that administrative decisions are made in a timely manner.
- The authority regarding implementation of RA6969 and DAO 92-29 to the DENR regional offices is yet to be fully delegated, and the mechanisms to authorize orders and guidance regarding the law and the regulation have not been established between the EMB central office and the DENR regional offices. The delegation of the authority and the establishment of the mechanisms should be completed as soon as possible.

- In conjunction with the delegation of the authority and the establishment of the mechanisms, policy formation function of the Hazardous Waste Management Section of the EMB should be strengthened.

- The HWM database has been established during the Study; it is necessary to designate the Management Information Section of the EMB to be in charge of maintenance of the database in order to properly maintain the database. Access from the DENR regional offices to the host server at the EMB central office is constrained due to the limited number of telephone lines. To improve the accessibility, the telephone line dedicated to the HWM database access should be secured at each DENR regional office that is connected to the database system. In addition, because it is impossible for two or more DENR regional offices to simultaneously access the host server at the EMB central office, the schedule or rule on use of the HWM database among the DENR regional offices should be established.

- The input data to the HWM database should be accurate; it is necessary to ensure the complete examination of the documents submitted by the applicants upon the registration at the DENR regional offices and continuously conduct training on enhancing the DENR regional staffs' capability of the document examination.

- The EMB central office and the DENR regional offices should utilize the HWM database for preparation of the annual report on the hazardous waste management and policy formation.

- Each DENR regional office should prepare and implement the action plan on registration expansion as well as the monitoring plan every fiscal year.

15.4 Budget for HWM Administration

- Budget allocated to HWM administration at both the EMB central office and the DENR regional offices is insufficient. It is necessary to secure budget for the HWM database utilization, monitoring of HW generators, transporters, and treaters (vehicles and fuels), researches for policy formation, and training for the EMB and the DENR regional staffs.