Executive Summary

EXECUTIVE SUMMARY

PART 1 OUTLINE OF THE STUDY

1. Study Background

Japan International Cooperation Agency decided to conduct the Study on "Master Plan for Hazardous Waste Management in Romania" in response to the request of the Government of Romania.

In November 2001, JICA and the Ministry of Waters and Environmental Protection (MWEP) of Romania have signed the Scope of Work and Minutes of Meeting for the Study. In February 2002, JICA commenced the Study by forming a JICA Study Team comprising of two Japanese consulting firms.

2. Study Objective

The Study Objective is:

- To strengthen hazardous waste management system in Romania at both governmental and private sector levels.

Major focuses of the Study is:

- To strengthen the government organizations, as well as to strengthen the awareness of the private sectors that generates hazardous waste.

3. Counterpart Organisations

The main Romanian counterpart agency for the Study is the Ministry of Water and Environmental Protection. Members of the Steering Committees for the Study are representatives of:

a. Ministry of Water and Environmental Protection
b. Ministry of Industry and Resources
c. Ministry of Health and Family
d. Ministry of Agriculture
e. Ministry of Public Works and Transport

The EU Romanian office has participated in the Steering Committees as observer.

JICA Study Team has collaborated with the National Institute for Research and Development of Environmental Protection (ICIM) in some aspects of the Study including waste generation surveys and pilot projects.

Since completion of this Study, the Romanian Government has started a major reorganisation based on reducing the number of Ministries from 23 to 14. The MoWEP has now been subsumed by the Ministry of Agriculture with the formation of the Ministry of Agriculture, Forests, Waters & Environment (MAFWE). This re-organisation started with Parliament's Decision issued on this subject on 19 June 2003. The National Environmental Guard, "a special body of the central public administration with legal personality" is subordinated to the National Authority for Control.

4. Major Outputs and Activities of the Study

Major outputs of the Study are:

- National Strategy and Action Plan for Hazardous Waste Management
- Transfer of know-how and technologies concerning hazardous waste management and its planning
- Implementation of the following four (4) Pilot Projects:

Pilot Project 1: Promotion of heavy metal recycling using existing smelting facility
Pilot Project 2: Improvement of hazardous waste treatment in plating and surface treatment
Pilot Project 3: Promotion of voluntary actions and pro-active waste management within chemical and petro-chemical industries
Pilot Project 4: Strengthening an EPI Capacity in Hazardous Waste Management

The Study period is 1.5 years from February 2002 till July 2003. The Study area covers the whole of Romania.

A full version of this part (Part 1 Outline of the Study) is shown in Volume 5.

PART 2 SUMMARY OF PROPOSED PRINCIPLES, STRATEGY AND ACTION PLAN FOR HAZARDOUS WASTE MANAGEMENT IN ROMANIA

Part 2A: Proposed Principles for Hazardous Waste Management in Romania

Part 2B: Current Conditions and Issues on Hazardous Waste Management in Romania

1. Hazardous waste generation and data management
2. Waste prevention and recycling
3. Collection and transport of hazardous waste
4. Treatment and disposal of hazardous waste
5. Management of contaminated sites
6. Administrative, legislative and institutional aspects
7. Economic aspects

Part 2C: Summary of Strategy and Action Plan

Part 2A Proposed Principles for Hazardous Waste Management in Romania

Proposed principles are summarised as follows:

- *HWM Responsibility*

  Hazardous waste generators are responsible for HWM based on Polluter Pay Principle (PPP). The Romanian government assumes responsibility in case where responsible owners of waste is not existent or not identifiable.

- *HWM Objectives*

  HWM objectives are:

  - minimise impacts of hazardous waste on health and environment
  - maximise effective use of resources

- *HWM Technology*

  HWM technology should be economical, affordable, yet environmentally sound. Win-win technology should be applied wherever possible.

- *Implementation of EU Directives*

  Schedule for implementation of EU directives should be steady and realistic. Romanian government should have a credible implementation plan.

- *Law Enforcement*

  In reality, many Romanian enterprises are allowed not to apply even a minimal environmental standard. Such situation will keep enterprises' willingness to pay for pollution control at very low level. MWEP/EPIs should strengthen their enforcement in a gradual and steady manner. Under the above-mentioned situation,

  1) enterprises (waste generators) have no or little incentive for hazardous waste prevention and recycling, and
  2) hazardous waste management service market will not develop.

  Higher willingness to pay on the part of waste generators will play a key role in advancing the waste disposal, prevention and recycling as well as for creation of hazardous waste management service market. The strong law enforcement is the

most effective way to increase the willingness to pay.

- *Awareness raising*
  A government role is to strengthen:
  - awareness of hazardous waste generators about win-win opportunities
  - awareness of citizens and EPI staff about health risks associated with hazardous waste including illegally reused waste oil.
- *Provision of funds for industrial and environmental upgrading*
  It is very difficult for Romanian enterprises to acquire funds for industrial and environmental upgrading as the financial market is not well developed. Under this situation, it would be justified that the Romanian government establish a funding mechanism to provide soft loans for those who are willing to invest for industrial and environmental upgrading using internal and/or external funds.
- *Policy reform*
  Efficient use of energy, water and raw materials is a base for a good industrial and environmental management including HWM. A key role of the government is to ensure that society has an incentive for efficient use of those resources. Energy and water price reform, privatisation of state owned enterprises, market liberalization, and awareness raisin are key instruments to enhance such incentives, particularly in a transition economy like Romania.

Part 2B Current Conditions and Issues on Hazardous Waste Management in Romania

1. Hazardous Waste Generation and Data Management

1) Hazardous Waste Generation

- It is estimated that hazardous waste generation quantity in Romania in 2002 is 1.2 million approximately. Waste oil shares about one half of the total quantity. The second largest is metal waste 30% approximately. Third is sludge (non-specified) 9 %.
- Hazardous waste is generated in all regions, share of each region in terms of generation quantity ranges between 9% – 16%. (Bucharest municipality and Ilfov are considered as one region.)
- Per capita hazardous waste generation rate is estimated to be 53 kg/capita in 2002. Corresponding rates were 252 kg/capita in 1995, and 103 kg/capita in 1999.
- Those rates are smaller than average hazardous waste generation rates in Central and Eastern European Countries (CEEC), i.e. Bulgaria, Czech republic, Estonia, Hungary, Lithuania, Poland, Romania, and Slovenia. CEEC's average rates were 283 kg/capita in 1995, and 183 kg/capita in 1999. (Source: Draft Waste Strategy; English draft May 2002, MWEP/ICIM)
- Major reason for the substantial decrease in the hazardous waste generation rates is considered to be the drop in industrial outputs over the period rather than improvement in production technology.

2) Hazardous Waste Data Collection and Management

- MWEP has a data collection system for waste including hazardous waste. However, there is a need to improve data quality and reliability.
- A basic problem is that waste generators (enterprises) do not know how to identify and classify hazardous waste with a reasonable accuracy.
- Changing Definition of Hazardous Waste: Romania intends to apply new EU Integrated Waste List soon. Unfortunately, it would add confusion to waste generators for some years to come.

2. Waste Prevention and Recycling

- Awareness of cleaner production methods is low. Both diffusion of information and awareness raising as well as measures to promote economic instruments are required. Implementation of the IPPC legislation is expected to improve this situation.
- According to the present HW generation structure, priority sectors for waste prevention and recycling are the chemical, oil and petrochemical, non-ferrous metal smelting, electroplating and surface treatment industries. Priority HWs to be recycled are waste oils, waste solvents and HW containing heavy metals.
- Since there are at present almost no facilities for off-site HW recycling except lead acid batteries, the utilization of existing facilities should be prioritised in terms of HW management. In this regard, the Romanian cement industry has an important role to play in the HW recycling and disposal business.

3. Collection and Transport of Hazardous Waste

Romania does not have a developed network of waste contractors who arrange the collection and/or recovery / treatment / disposal of hazardous wastes other than for used waste oils, and acid batteries. With relatively little wastes being transported for off-site disposal, Romania currently lacks the necessary skills and infrastructure for safe transport of hazardous wastes. Also, given the almost complete absence of large-scale hazardous waste transport in Romania, it is an area where the Environmental Protection Inspectorates understandably lack regulatory experience and capacity.

Prior to development of hazardous waste collection and transport services, it is first necessary to create demand for appropriate treatment and disposal of hazardous waste.

4. Treatment and Disposal of Hazardous Waste

1) General Situation

Hazardous waste management is variable in Romania. In common with many countries with transitional economies, many of Romania's industries have old, out-dated, inefficient processes and equipment. This is particularly true of waste treatment and disposal systems where these exist. Implementation of the IPPC legislation is expected to improve this situation.

Many hazardous wastes are being "stored" pending later management. The term "storage" implies a future intention to do something with the material stored, but in Romania the term storage is used interchangeably with the term "disposal". Most "stores" are in reality waste dumps. Improper stores /dumps need to be identified and the wastes dealt with properly.

Some companies who have their own incinerators to manage hazardous wastes they generate accept waste from third parties for disposal. The majority of these incinerators do not meet current European standards and will require substantial upgrading to comply with such standards when these are introduced in Romania.

The cement industry in Romania is keen to be involved in hazardous waste management and one company has, in partnership with a waste management company, developed an organic waste blending facility at one of its cement kilns. Cement kiln incineration is of major strategic importance in Romania

2) Regulation and Control

Effective regulation and control is the major driver to improve hazardous waste management. As indicated elsewhere in this chapter, a basic institutional structure exists along with much of the necessary legislation. It is necessary to improve application of effective regulation and control by:

- Continuing to develop the legislative base for regulation and control of hazardous waste management.
- Provision of sufficient resources.
- Training regulation and control personnel to enable them to undertake their regulation and control activities most effectively.

3) Development of Necessary Infrastructure

As indicated, the necessary infrastructure for hazardous waste management is under-developed. Potential developers are experiencing difficulties due to a general lack of willingness on behalf of hazardous waste generators to pay for proper management of their wastes. The development of improved infrastructure needs to be accelerated.

All stakeholders (waste generators, waste management companies, regulators, the government and the public) have roles to play in encouraging and facilitating this development. The provision of economic incentives has been extremely successful in Europe and should be considered in Romania.

4) Measures for Certain Waste Types

Chapter 7 in Vol 2 describes the situation, the issues, and makes recommendations concerning the following waste types:

- PCBs (s7.2)
- Pesticides (s7.3)
- Organic chlorinated solvents (s7.4)
- Waste oils (s7.5)
- Medical waste (s7.6)

One of the issues we consider we need to emphasise concerns the issue of PCBs, and the main points are summarised below:

- Any PCB `handling' (ie liquids transfer from transformers, decanting, transport, treatment etc) should only be done after a prior rigorous risk assessment of the proposed Operating Procedures and written Test Protocol to verify the proposed Operating Procedures.
- PCB `solids' – JICA study team is of the opinion that there is no incineration facility currently in Romania (other than cement kilns which preclude PCB

handling as a matter of policy) which has the capability of destroying PCB solids to the required destruction efficiency of 99.995%.

- PCB `liquids' – JICA Study team is of the opinion that the only incinerator in Romania (other than cement kilns which preclude PCB handling as a matter of policy), which may have the capability of destroying PCB liquids (not solids) to current EU standards, is that of Oltchim (Rm Valcea).

See also Vol 1 Ch 5.5.3 section 3) which refers to PCBs and export for destruction. Action G5 (in Vol 1, Ch 9) also refers to this issue. In Vol 2, Ch 7 Section7.2, we specifically state `a better strategy for Romania; "evaluate the option for final elimination by export to a proven facility ……." It is likely that the inventory is underestimated. EPIs need guideline for identification of PCBs like the Basel information notes. It is probable that a waste management contractor with hazardous waste high temperature incinerator in a proximate country (eg Austria) would be able to provide an estimate of costs for total service for secure removal, collection, transport and final elimination of PCBs.

5. Management of Contaminated Sites

Soil and groundwater contamination by leakage of hazardous substances from hazardous waste deposits and storage sites raises the risk of chronic long term exposure through water consumption and land use, resulting in possible health and ecological damages. There is however an insufficient knowledge and awareness of the extent of contamination due to contaminated sites and their environmental impacts. Understanding the present conditions of environmental management of contaminated sites and the existing potential impacts of hazardous contaminants in Romania should be an important issue for the MWEP. There is a need to set up a policy of management of contaminated sites (objectives, procedures, jurisdictions) through new ministerial orders, technical guidelines, awareness raising, and institutional coordination.

6. Administrative, Legislative and Institutional Aspects

1) Strategic Planning and Implementation

Starting in the 1990s, this has been a developing process in Romania, culminating in the National Environmental Strategy (NES) and the National Environmental Action Plan (NEAP). Generally speaking these strategic planning processes are in line with international and in particular with EU processes. These strategic planning exercises are currently being extended to the entire country, including National and local/regional Waste (and Hazardous Waste) Management Strategies and Plans, Local Environmental (LEAPs and REAPs) and Sustainable Development Plans (Agenda 21).

Implementation continues to be most difficult issue and has been addressed in our Strategy and Action Plans.

2) Legislation and EU Harmonisation

Regarding waste management and industrial pollution control, and although very significant progress has been achieved over the last two (2) years, Romanian legislation is only partially meeting the Acquis Communautaire. Therefore, these continue to be a priority field in legislation. Government Emergency Ordnance No 78/2000 introduced framework legislation for waste management, including hazardous waste management, and transposed the requirements of the EC Waste Framework Directive 75/442/EEC and its daughter Directives into Romanian legislation. This Ordinance was approved by GD

426/2001 in late July 2002.

The requirement to adopt a more strategic approach to hazardous waste management has also been reinforced by the need to implement the Landfill Directive (GD 162/2002) and the IPPC Directive (EGO 34/2002 endorsed by GD 645/2002), as well as the specific measures to remove the most dangerous chemicals from the environment. Furthermore in December 1999, the 5th Conference of Parties to the Basle Convention (of which Romania is a member) made a high level declaration on the environmentally sound management of hazardous wastes.

Much of the most important EU waste legislation has been transposed. The biggest challenge for the new Waste and Hazardous Chemicals Department of the MAFWE is to:

- Finalise the Chapter
- Prepare and co-ordinate the secondary legislation to fill the framework, and
- Implement all the requirements.

3) Administration and Capacity Building

This is probably the singular most important issue in this section; implementation and enforcement of the regulatory and control measures that are required to provide confidence and support to those considering investing in commercial hazardous waste management services. Much donor technical assistance has been focussed on capacity building within the authorities responsible for environmental policy and management in Romania

Administration and capacity building is the overriding factor to achieving change, and this is what is required. The MWEP and its subordinated EPI play a key role in implementation and enforcement of environmental policies and legislation. They have limited human resource (~2000 persons) and limited budget; in comparison Apele Romane have 9000 persons. In this situation, and recognising the financial limitations, our recommended strategy is based upon the role of the MWEP moving towards responsibility for policy frameworks, facilitating and co-ordinating. Decentralisation and de-concentration of tasks and responsibilities from national level to lower levels is one of the consequences and means.

7. Economic Aspects

- Relatively little use is made of economic instruments for pollution control and hazardous waste management.
- Rapid improvements in economic and financial policies related to pollution control and cleaner production in general, and hazardous waste management in particular, are hampered by various inefficiencies in the overall economic system, such as the continued existence of State Owned Enterprises, inadequate pricing polices for key resources such as energy and water; and inefficient capital markets.

Obvious priority investments for pollution control, cleaner production technology, and hazardous waste management, which are clearly justified in economic and environmental terms, are often not practicable due to an inadequately functioning financial system. Interim financing measures must therefore be developed. These may involve subsidies in some form, which, while not an ideal solution, may be the only way in which needed improvements can be achieved.

Part 2C Summary of Strategy and Action Plan

1. Strategic Objectives

In response to MoWEP's request, JICA Study team has elaborated the Strategic Objectives and Measures of Hazardous Waste Management in table form using the proforma adopted by the MoWEP within with EU German Twinning Group and JICA Study Team. MoWEP expressed that the elaborated hazardous waste management objectives and measures will be a part of National Waste Management Plan for Romania which has been formally accepted by the Romanian government as the government official plan. The Strategic Objectives and Measures of Hazardous Waste Management are expressed in two tables. (See Volume 1 Chapter 9 Tables 9.2.1 for general hazardous waste and 9.2.2 for certain hazardous waste.)

In the two tables, the measures proposed are those required to achieve the stated objectives. The proposed measures are further supported by Actions, which are coded like A1 …J1. Therefore, it is considered that those actions have become a part of the National Waste Management Plan that have been formally approved by the Romanian government.

This table provides a summary overview of the strategies described in the earlier chapters 3 - 8. These strategies have been prepared considering 1) current Romanian economic conditions, 2) current Romanian hazardous waste management conditions, 3) current Romanian capacity in hazardous waste management, and 4) EU directives.

Low cost and economical systems yet with environmentally effective solutions as well as gradual improvement were considered important for development of facilities for hazardous waste management. Significant emphasis was also put on capacity building of government staff and awareness raising for waste generators.

2. Action Plan

The above Actions are listed below and, and fully described in Volume 1 Section 9.3.

A. HW Management Strategy and Plan

A1. Authorize the Strategy and Plan

A2. Implement the Plan

A3. Develop and implement `sectoral strategies and plans' listed in Waste Laws

A4. Review these National level Waste Strategies and Plans

B. Information System Legislation & EU Harmonisation

B1. Secondary legislation

B2. Prepare technical guidance notes to support the legislation

C. Administration & Capacity Building Environmental Authorization and Permit

C1. Establish national hazardous waste data management system

C2. Develop National Waste Management Information System (WMIS)

C3. Modify requirement on information to be submitted by enterprises for authorization to

include waste management plan

C4. Establish a forum (Federation) for advancing the scientific, technical and practical aspects of wastes management.

D. Environmental Compliance

D1. Check legal/illegal status of existing industrial waste storage/deposit sites

D2. Re-commission the existing on-site waste treatment facilities within factories

D3. Model Voluntary Agreements to be entered into between Government and selected industrial plants

D4. Strengthen waste inspection capacity at EPIs

D5. Review policy and penalty rates for enforcing non-compliance

D6. Review EPI waste management staff requirements and performance indicators (linked with D7)

D7. Modify ROF and Ministerial Order 541/2000 concerning waste inspection activities (linked with D6)

E. Prevention

E1. Diffuse waste minimization and improved treatment practice in metal finishing industries

E2. Establish a bottom up and practical approach for diffusion of IPPC

E3. Diffuse “Responsible Care” and “Voluntary Environmental Management” to chemical industry and petro-chemical industry

E4. Phase out/ban certain hazardous chemicals

F. Recycling

F1. Promote introduction of hazardous waste audit

F2. Promote off-site recycling using existing smelter

G. Treatment and Disposal

G1. Promote treatment/thermal recycling of hazardous waste at cement kilns

G2. Promoted Development of necessary dedicated treatment facilities to include physical/chemical treatment and stabilisation of predominantly inorganic wastes

G3. Develop landfill sites for hazardous waste

G4. Develop medical waste incineration

G5. Evaluation of options for PCB destruction and support to implementation of GD 173/2000

G6. Dispose of obsolete pesticide

H. Historical Waste and Hazardous Waste Storage Sites

H1. Legislative and institutional actions to prepare a policy of management of historical hazardous waste contaminated sites in Romania

H2. Actions for constitution of a database, diffusion of data, preparation of technical guidelines, and awareness raising

H3. Actions for the development of remediation measures and planning of cleanup projects

I. Development of Hazardous Waste Management Business

I1. Promote hazardous waste management business (linked with I2)

I2. Assure systems and procedures for hazardous waste (linked with I1) transfer and/or transport

J. Feasibility Study for Funding for Industrial Upgrading

J1. Conduct a feasibility study for funding for industrial upgrading

PART 3 PILOT PROJECTS

As part of this JICA Study, we have carried out the following four (4) Pilot Projects:

Pilot Project 1: Promotion of heavy metal recycling using existing smelting facility
Pilot Project 2: Improvement of hazardous waste treatment in plating and surface treatment
Pilot Project 3: Promotion of voluntary actions and pro-active waste management within chemical and petro-chemical industries
Pilot Project 4: Strengthening an EPI Capacity in Hazardous Waste Management

Results of the pilot projects are shown in Volume 4. Volumes 6 to 9 present guidance notes, manuals and other relevant documents produced in the course of implementation of the Pilot Projects. The following table summarizes the pilot projects in terms of participants, and facilities provided.

Outline of the 4 Pilot Projects

Project Name/ Objective	Participants (Signer of Agreement)	Other Participants	Facilities Provided	Facility cost (US$)
1) Promotion of heavy metal recycling using existing smelting facility	a. Sometra S.A. b. Romplum c. Phoenix	d. Copsa Mica municipality e. EPI Sibiu f. EPI Baia Mare	Briquette machine installed at Sometra	60,000
2) Improvement of hazardous waste treatment in metal plating and surface treatment	a. Direct Auto b. Timpuri Noi SA	c. EPI Arges d. EPI Bucharest	Zinc plating lines of cleaner production type	72,000
3) Promotion of voluntary actions and pro-active waste management within chemical and petro-chemical industries	a. FEPACHIM b. FEA S.A. c. AMCO d. Koyo	5 FEPACHIM Member Firms which participate in making "Company Voluntary Environ-ment Management Plan": e. Petromidia S.A. (refinery) f. SC Uzinele Sodice g. Govora S.A (soda, ammonia) h. Azo-Mures (fertilizer) i. Sicomed S.A. (pharmaceutical) j. PoliColor	Closed solvent degreasing and recovery systems (Recipients are b, c & d)	76,000
4) Strengthening an EPI Capacity in Hazardous Waste Management	a. EPI Arges	Companies which participate in making enterprise waste management plan: b. Dacia (automobile manufacturer) c. Arpechim (refinery) d. Presate Dacia (car spare parts manufacturer) e. Ana Imep (electric motors) f. Direct Auto Rom (car spare parts)	Analytical equipment for hazardous waste for Arges EPI	38,000
				246,000

Source: JICA Study Team