



The Hashemite Kingdom of Jordan



MINISTRY OF ENVIRONMENT

**The National Profile for the Management
of Chemicals**

**Third Edition
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وزارة البيئة

MINISTRY OF ENVIRONMENT

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Introduction:

The last decades of the twentieth century witnessed enormous industrial development in all walks of life. However, it is hard to speak about this development without referring to tens of thousands of chemicals introduced to the environment. This resulted in achieving human welfare and obtaining material gains on the one hand and damaging and causing serious deterioration to the environment and its components on the other as a result of which many people have now strange understanding that chemicals are synonym to poisons.

In order change this understanding in its entirety, the International Forum for Chemical Safety (IFCS) was established in 1994 upon recommendations that came out of the Earth Summit, held in Rio De Janeiro in 1992. Chapter 19 of the Agenda 21 has highlighted the opportunities required for improving and developing chemicals management, like the existence of programs concerned with strengthening national capabilities and potentials for the management and development of chemicals. It has also shown the need for national profile projects for analyzing the present situation in dealing with chemicals in terms of manufacture, storage, import, export, use, handling, destruction and identifying the available infrastructure for its management.

The idea for preparing and publishing a comprehensive national profile was adopted and executed by the Ministry of Health with the support of the World Health Organization (WHO) and participation of the concerned different bodies in the Kingdom and the first National Profile was issued in 2000.

However, and due to the fact that the nature of the content of this Profile and the information it contains are changing continuously in all technical, institutional and legislative aspects, it was necessary to update this profile. This step came to light in 2002 with the support of (UNITAR) through the agreement signed with the then General Corporation for Environment Protection. The first updated Profile (Second edition) was issued also by the Ministry of Health with participation of all national bodies concerned with chemicals management and handling.

Updating the National Profile of 2005 (Third Edition) came as one of the requirements of the "Integrated and sustainable program for managing chemical materials and wastes" project, being implemented by the Ministry of Environment, with the support of (UNITAR). This project embodies several work teams, the members of which represent all concerned national bodies. This Profile is mainly based on what had been achieved in the Profile issued in 2002, through updating a lot of information that has

recently affected the status of chemicals management during the last three years.

Although it is hard to observe all changes occurring in this subject as a result of the fast changes on the one hand, and the difficulty in getting accurate information in view of the divergence of this subject, its reliance on the degree of coordination and cooperation with all concerned parties and that the teamwork did not represent important bodies whose presence was necessary on the other, therefore we are hopeful that the information included in this Profile will be a useful reference for all parties concerned with chemicals management, whether at the level of decision- makers or of industrial and research centers inside the Kingdom and abroad.

Executive Summary:

Jordan has made great steps in development at all levels and in different domains, including industrialization. Investment promotion and attraction policy in force as well as the investment climate and security stability in Jordan have contributed to establishment of different industries, including chemical and pharmaceutical industries. The spread of those industries was accompanied by an active movement for importing raw chemicals and exporting processed products of such materials. Therefore, it was necessary to raise the level of interest in all matters related to chemicals' management from the legislative and institutional aspects, capacity building, and develop training, education and awareness, quantitatively and qualitatively and to focus attention on the wastes, environmental impacts and accidents resulting from chemicals.

Despite the efforts exerted in such fields, there remains a lot of work to be done and "follow up" to ensure the setting up of an integrated management for chemicals and the resultant wastes and accidents with the aim to protect the environment and the health of citizens and safety of workforce and consequently, achieve sustainable development.

When reviewing the different chapters of this Profile, we will notice the present state of affairs of chemicals management in Jordan and that there is a number of gaps and obstacles facing such management and the efforts being exerted for improving it. The present situation can be summarized as follows:

- 1- The current measures adopted by the Customs and other concerned authorities do not provide complete control over the importation of chemicals into Jordan in so far as its testing in order to identify or register them based on its scientific name as the customs Labs, test the chemicals only for the purposes of customs tariff.

However, the adoption of a new mechanism recently, in which specific measures are taken to strengthen control on the entry and import of chemicals into Jordan, and under which the importer is obliged to apply these measures as a precondition for approving the import application and selecting a party to act as a coordinator for this purpose through (the Ministry of Health/ Environmental Health Directorate), would contribute to tighten control on the entry of these materials.

- 2- Lack of sufficient and accurate information on the quantity of chemicals, which are imported, locally produced, or used inside the Kingdom. The same thing applies to chemical wastes produced and expected in future. The reason is attributed to:

- Insufficient local legislations in force and poor activation of the existing ones in order to obligate the importers of chemicals and local plants producing chemical products to periodically provide the concerned bodies with the required information.
 - Poor coordination between the institutions concerned with chemicals management to carry out comprehensive survey for the industrial sectors to determine the quantities and types resulting from the chemical wastes.
 - Lack of accurate computerized system to specify the quantities, types, and places of use of many chemicals.
 - Lack of a national classification system, which is adopted by all concerned institutions.
- 3- Certain areas still face different problems caused by pollution. These problems are connected with the nature of activities in these areas. For example, air pollution is noticed more in areas where industries are concentrated such as cement (Fuhais and Rashadiah), phosphate (Al Hasa and Al Obaid), oil refining (Al Hashemiah) and metals melting (Marka and other areas). However, agricultural areas (Jordan Valley) are exposed to intensive and irregular use of pesticide, and fertilizers. Certain industrial areas also face general problems like storage, handling, and disposal of solid and liquid chemicals. The degree of attention of the authorities concerned with these problems varies from one party to another. According to the National Agenda (21) Zarka area was identified as an "Environmentally Hot Area."
- 4- In general, it is noticed that the problem involving chemicals management and dealing with the negative impacts resulting therefrom lies in the fact that the information related to chemicals are insufficient although the concerned authorities have the potentials to identify the priorities associated with management of such materials.

Moreover, in spite of the attention at the national level with some issues and problems related to chemicals management, yet every government body has its own agenda for defining the priorities related to dealing with such materials according to their mandates and functions. There is no unified system or mechanism to identify the national priorities pursuant to the importance through which these problems are explicitly addressed according to a comprehensive national strategy for chemicals management.

- 5- The availability of mechanisms to activate chemicals– related legislations- is no less in importance than the legislations per se. In addition to the lack of legislations that should cover all life cycle stages of chemicals management (Import, export, production, use,

transport, storage and disposal of chemicals and treating their wastes), the enforcement of legislations in force is not effective or applied in the required form due to the following reasons:

- Lack of clear mechanism to be put in use for following up chemicals management stages.
- Unavailability of sufficient number of qualified staff to carry out the duties entrusted to them and related to chemicals.
- Multiplicity of the supervising bodies and the lack of coordination between them, which sometimes leads to scattering and wasting of the exerted efforts without achieving the intended objective or aim.
- Workers are not provided with the required information on handling the risks of chemicals.
- Unavailability of certain supervising bodies to oversee and implement public and private legislations related to chemicals.
- Compliance with the text and lack of analysis and necessary flexibility.

As for persistent organic materials, although there are no decisions that prevent their handling in accordance with the Stockholm Convention, yet there is no unified law or system that bans the handling of such materials. In most cases, prevention takes place by virtue of decisions issued by several ministries that have circulated these decisions, where possible, among most relevant departments and institutions. Nevertheless, the ban and control process was not dealt with as required.

6- Numerous legislations related to chemicals have been issued recently; they include but are not limited to:

- Public Health Law No. (54) of 2002, which includes a special chapter for chemicals stipulated by the Ministry of Health.
- Regulation for the management, transport, and handling harmful and hazardous materials No. (24) of 2005, issued in accordance with the temporary environment protection Law No.(1) of 2003.
- Regulation for the protection of environment against pollution in emergency cases No. (26) of 2005, issued in accordance with the temporary environment protection Law No. (1) of 2003.
- Regulation for evaluation of environmental impact No. (37) of 2005, issued in accordance with the temporary environment protection Law No. (1) of 2003.
- Instructions for handling hazardous wastes of 2003, issued in accordance with the temporary environment protection Law No. (1) of 2003.

- Instructions for management and handling with of consumed oils of 2003, issued in accordance with the temporary environment protection Law No. (1) of 2003.
 - Instructions for the transport of hazardous or explosive materials of 2003, of the Temporary Traffic Law, as amended.
 - Instructions for licensing carriers to undertake the transport of crude oil and its byproducts by tankers and the amendments thereof of 2003, issued in accordance with the regulation for licensing carriers and shipping agents and its amendments No. (45) of 2003.
 - Instructions for manufacturing, registering, licensing and handling veterinary medicine, bio-preparations and animal growth regulators No. (g/33) of 2003, issued in accordance with the temporary agriculture Law No. (44) of 2002.
 - Instructions for the regulation for imported products based on the degree of risk No. (4) of 2003, issued in accordance with the standards and specifications Law.
- 7- As for the work of the ministries and bodies concerned with chemicals management, it is noted that there are considerable overlapping and repetition in the work of different bodies with respect to chemicals. There is also multiplicity in terms of references due to the existence of many laws and regulations that are applied by different bodies in connection with chemicals management; also, there is no integrated national strategy for managing chemicals. Consequently, it shall be difficult to identify Jordan's priorities regarding management of these materials. Moreover, application of laws and regulations and penalizing violators depend mainly on the efficiency and competency of workers in this field.
- 8- Some nongovernmental organizations (N.G.Os), especially universities, chambers of industry and civil societies, take part in the decision-making process through specialized technical committees, such as the technical committee for reviewing the studies of evaluating the environmental impact on developmental projects. These bodies participate also with all interested parties in scoping sessions projects held for identifying the environmental impacts expected for these projects. Nevertheless, the flow of information related to chemicals management from the governmental authorities to nongovernmental organizations (N.G.Os) does not take place easily. N.G.Os can only obtain the information that should be specific, through correspondence. The same applies to the information available with N.G.Os, particular those available at research and studies centers, where the information cannot be disposed of except by permission from the body financing the research or study.

- 9- The contribution of industrial sector in the process of chemicals management is ineffective since there are no wide-scale projects or programs in the industrial sector to support this process. However, work has started recently in the application of the clean production project at a narrow scale by certain industries. This project, when applied on a wider scale by the industries at large, may contribute to the improvement of chemicals management. In addition, many industries are seeking to obtain (ISO 14000 Environmental Management System), which would positively reflect on environment management, including chemicals, in addition to competition in the field of export and opening new markets for Jordanian chemical industrial products.
- 10-The environment civil societies in Jordan play a vital role in the process of public education and awareness in the field of chemicals hazards through workshops and some awareness programs in addition to forming lobbying factors towards protecting the environment against pollution hazards, including chemical pollution.
- 11-The technical committees concerned with chemicals management normally represent all relevant bodies, whether governmental or nongovernmental. Some bodies or persons are called, as required and necessary, to carry out specific assignments. However, the mechanism available through these committees, do not cover all stages of chemicals management due to the unavailability of sufficient staff to properly undertake the duties entrusted to them. Furthermore, technical committees lack the mechanism to exchange information regarding chemicals as most of them work separately, in addition to the fact that there is no mechanism to evaluate the performance of these committees.
- 12-Most databases related to the management of chemicals and available with the concerned bodies, are stored on CDs or computerized programs. The existing database is updated whenever necessary and according to the available material potentials. The government authorities can exchange information through official correspondence, but so far, it has not been possible to obtain the required information through electronic link. It is expected that the "Jordanians integrated information system for managing hazardous materials" will undertake this role. This system will depend on an integrated networking system able to control all operations executed by the concerned ministries. It will be possible for each ministry to have access to the comprehensive integrated database of hazardous materials and the works in which hazardous materials are used and handled in Jordan. All ministries will be able to enter the information, related to the production, import and taking delivery and sale of hazardous materials as well as the accidents

related thereto. The general Customs Department will be provided with an instrument to identify any material through its CAS NO, scientific name, and trade name before permitting it into Jordan.

- 13-Most technical potentials related to chemicals are represented in specific purpose labs that serve the institution in which they exist. However, there is an urgent need for approved governmental labs to conduct chemical analyses that serve general purposes. There is always a need to update and develop the existing labs and to increase training programs specialized in modern lab equipment. Attention should be focused on chemical safety issues in factories, in which case chambers of industry can play an important role.

- 14-Despite its available limited potentials, Jordan is endeavoring to accede to all international agreements concerned with chemical safety and implement the articles of these agreements and share the international community in this respect. However, there are some obstacles in effectively applying some of the signed agreements due to insufficient qualified human cadres in order to properly deal with the provisions of these agreements and unavailability of technological and material infrastructure to achieve it. There is also a dire need for upgrading and enhancing the capabilities of the cadres working in this field under the supervision of supporting bodies to ensure the success of the established programs. In addition, there is a need for clear measures and practical national steps to implement the programs and the concluded agreements. The lack of national strategy for chemicals management and consequently identify Jordan's priorities would lead to ineffective linkage between the national capabilities and international programs, not to mention the poor coordination and cooperation between the official concerned bodies for the application of these programs and agreements some times in the required manner. In addition, many of the support programs outputs come in the form of studies and reports without the existence of a mechanism to support the actual implementation of these outputs.

- 15-Certain bodies concerned with management of chemical materials and wastes lack qualified cadre. Moreover, the need for training is urgent in some aspects of chemical materials and wastes management, for example:
 - Recycling wastes and the cleaner production.
 - Assessment of environmental hazards.
 - Environmental planning.
 - Chemical environmental catastrophes.
 - Medical wastes management
 - Management of chemicals and marine pollution.
 - Management of chemical industrial wastes (solid and liquid).

Recommendation:

- 1- To enhance the control role of chemical safety issues, and to apply standard specifications at factories by creating a separate and trained unit with limited duties enjoying the capacity of judicial police.
- 2- To circulate the outcomes and benefits of the prospective "Jordanian integrated information system project for the management of chemicals" in order to facilitate the exchange of information between all bodies concerned with management of chemicals.
- 3- To issue separate guidelines for each stage of the management of chemicals.
- 4- To adopt a national system for the classification of chemicals.
- 5- To establish a specialized center for qualifying local cadres in different fields, provided that a national rehabilitation cadre curriculum shall be adopted for training trainees and personnel engaged in the implementation of proposed programs and projects. Scientific competency in the required field and ability to communicate with and contact others should be observed when choosing such cadres.
- 6- To develop and approve a specialized governmental lab for conducting chemical tests of imported and locally provided materials as well as environment elements, including water, air and soil provided that these tests and their results shall be internationally recognized.
- 7- To introduce scientific courses to the universities, institutes and schools on the sound management of chemicals, commensurate with the standards of teaching therein.
- 8- To create and develop efficient mechanisms for the application of legislations related to the stages of chemicals management and to provide and train cadres specialized in the application of these legislations.
- 9- To increase the opportunities of private sector to participate in the process of chemicals management, to contribute to finding proper solutions for the problems facing such management and to strengthen cooperation between governmental and nongovernmental bodies in this respect.
- 10- To promote different mass media to participate in the program and plans for enlightening the local community of unsound management of chemicals and chemical wastes.
- 11- To follow up scientific developments and international agreements related to chemicals and to provide the means for acquiring knowledge and modern technology.

- 12- To support hazardous wastes management project and to provide financial and technical support for the project site at Suwaka to be able to perform its role in handling and disposing of chemical and hazardous wastes.
- 13- To conduct a preliminary review of the priorities of chemicals management.
- 14- To draw up plans and programs for managing chemicals to be in consistent with the national strategy for the environment and other development plans.
- 15- To periodically update the National Profile with the participation of all concerned bodies and permit different developmental sectors to take part in this process in the future.

Chapter One

General Background

(1-1) Natural and Demographic Structure of Jordan

The Hashemite Kingdom of Jordan is one of the Middle East counties bordered to the north by Syria, to the east by Iraq and Saudi Arabia, to the west by Palestine and to the south by Saudi Arabia and the Gulf of Aqaba.

The attached maps show the general location of the Kingdom and its administrative divisions.

Table (1-1): the most important data related to natural and demographic structure of the Kingdom*

Jordan area (km ²)	88778 km ²
State regime	Parliamentary Monarchy, Hereditary
Official and local language	Arabic
Population number in million	5.35 million
Ratio of urban population to today population	82.3%
Ratio of rural population to total population	17.7%
Number of population at employment age (15-65)	59.1% of population number = 3.161.850
Birth rate	29 birth/ 1000 population
Expected average population age	71.5 Years
Illiteracy Rate	9%
Unemployment rate	13.4%
Rate of employed women to total workforce	16.2%

*Source: General Statistics Dept./ Annul census 2004 Employment unemployment survey 2005

(1-2) Political and Geographic Structure of the State

The Hashemite Kingdom of Jordan consists of 12 governorates, including 39 districts, 57 sub-districts, 97 municipalities, and 12 boroughs. Jordan is a democratic country represented in a House of Representatives elected by the people.

Arabs form the great majority of the population of Jordan at 98%, while the remaining percentage is distributed on minorities, like

Caucasians, Chechens, and Armenians. Islam is the dominating religion in Jordan with Muslim 96% and Christians 4%.

Politically, there are three authorities in the Kingdom:

- 1- The Executive Authority (government).
- 2- The Legislative Authority (Upper and Lower Houses of Parliament).
- 3- The Judicial Authority (independent of the government).

Geographically, Jordan is divided into three major regions from the west to the east as follows:

1. The Jordan Valley
2. The plains and heights
3. The Badia, which forms most area of Jordan

(1-3) Industrial and Agricultural Sector

Jordan has recently witnessed a remarkable industrial development. The industrial sector in Jordan is basically formed from light and transformation industries in addition to mines, and quarries ...etc. However, major industries are represented in the extraction and processing of phosphate and potash, fertilizer production and oil refining. Agriculture is represented in planting field harvests, vegetables, and fruitful trees and its animal production is represented in livestock and poultry breeding. **Table (1-2)** shows a brief presentation of industry and agriculture sectors, while **Table (1-3)** represents distribution of agricultural and plant production according to geographical regions.

Table (1-2) Summary of the industry and agriculture sectors*

Sector	Contribution of sector in national production%	Number of Employees	Major Products
Industry	17.37%	159913	Transformation industries of different types: Fertilizer, pharmaceutical preparations, foodstuff, textile, clothes, detergents insecticides ..etc
Mining	2.23%	7562	Cement, phosphate, Potassium chloride ...etc.
Agriculture	3.373%	62000	Vegetables, fruits, fruitful trees, animal product.
Total	22.973%	229475	

*Source: General Statistics Dept. 2004

Table (1-3) Distribution of agricultural product as per regions.

Region	Most important harvests	Number of employees**	Productive area in Hectare
Jordan Valley	Fruitful Trees		9302
	Harvests		1265
	Vegetables		18375
Heights	Fruitful trees		157815
	Field harvests		29479
	Vegetables		27002

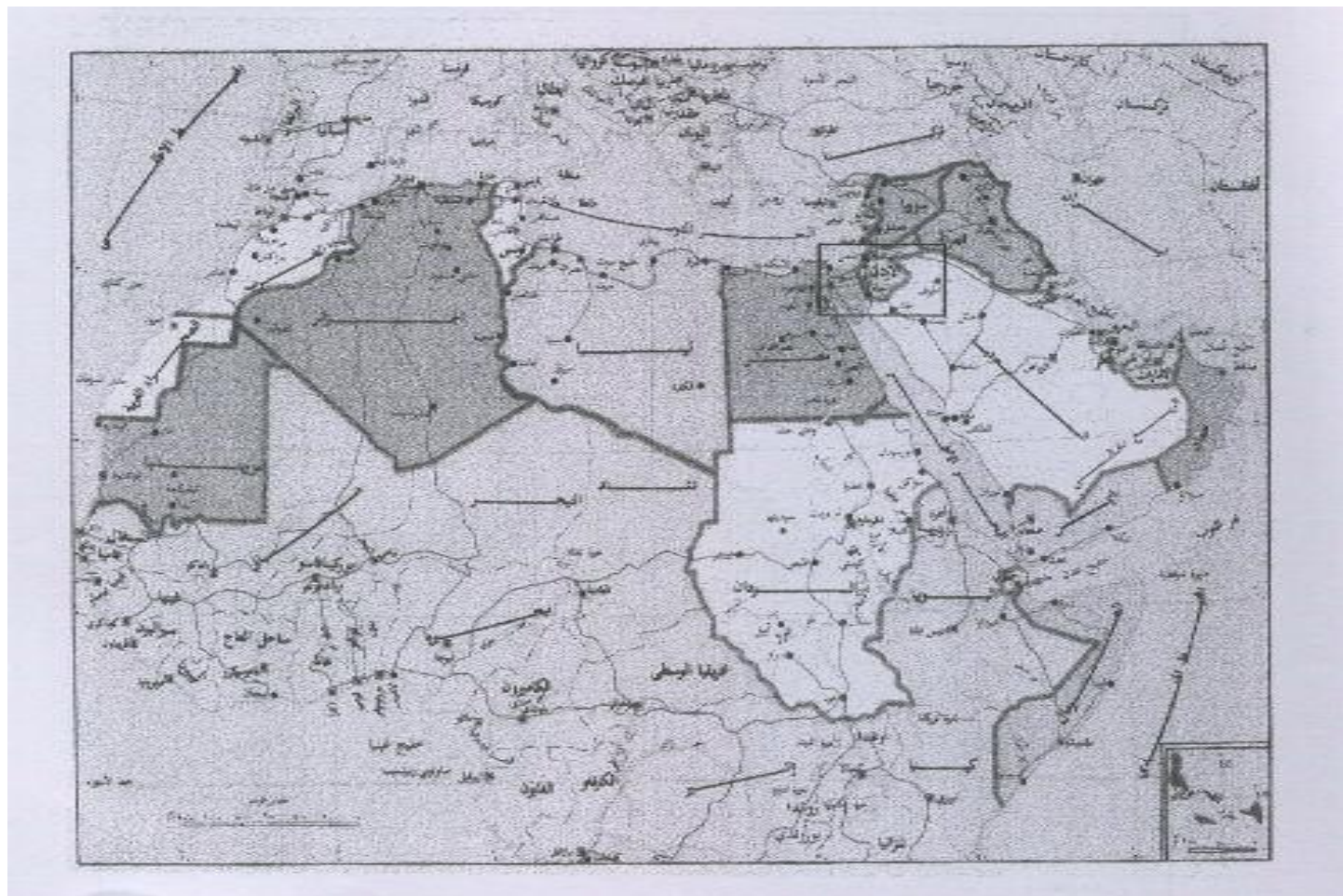
* Source: Ministry of Agriculture

** Number of paid workers employed in different fields of the agricultural sector is about 72500 workers accounting for 6% of the total workforce.

Agricultural lands in Jordan Valley depend entirely on irrigation while the percentage of irrigated lands in the heights is 32% and 68% in the un-irrigated lands in the heights.

Table no. (1-4) shows distribution of factories according to governorates. Table no. (1-5) shows major industries and number of firms, workers in industrial sectors and pollutants resulting from it.

Map No. (1) Showing the General Location of the Hashemite Kingdom of Jordan



Map No. (2) Showing the Administrative Divisions of the Hashemite Kingdom of Jordan

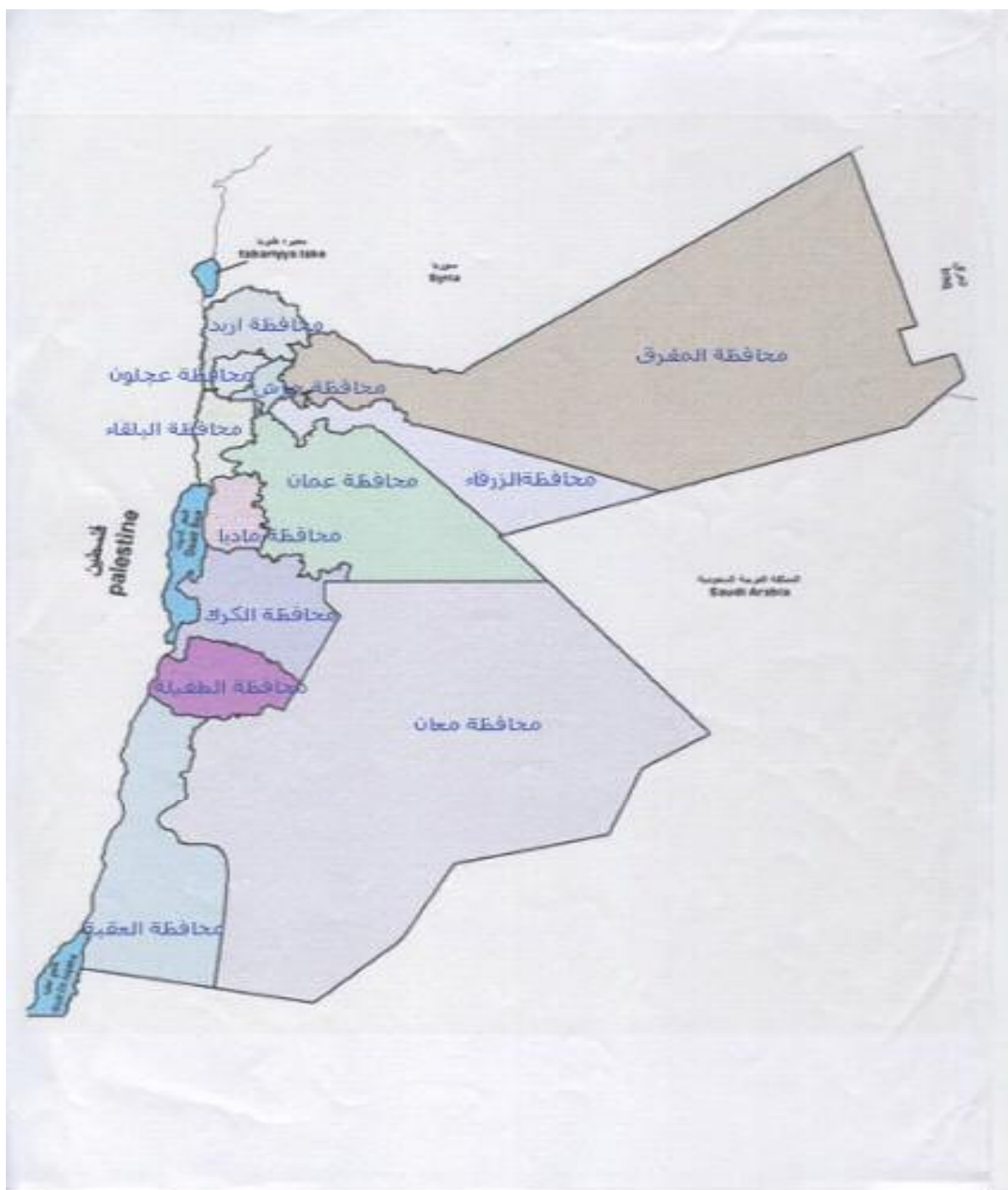


Table (1-4): Distribution of factories according to governorates. *

Governorate	Major Industries	Total production value	Number of factories	Number of employees
Amman	Inks, detergents, ceramic, gases, cosmetics, polymers and chemicals, insulation materials, drugs, fireworks, fertilizers, aluminum, insecticides, plastic, tanning, paints, etc	-	1033	-
Irbid	Detergents, insecticides drugs, polymerization and chemicals, fertilizers, textiles, printing presses, etc	-	130	-
Karak	Veterinary medicines, tobacco, cigarettes, polymerization and chemicals, polystyrene, textile, printing press, foodstuff... etc	-	15	-
Tafila	Polymerization and chemicals, fodder, mining industries. etc	-	5	-
Maa'n	Glass, polymerization and chemicals etc	-	5	-
Zarqa	Inks, detergents, polymerization and chemicals, polystyrene insulation materials, foodstuff, insecticides, drugs, fertilizers, printing press, textiles, paints, petroleum refinery, sponge, plastic etc.	-	279	-
Balq'a	Detergents, drugs, ceramics, polystyrene, aluminum, foodstuff, insecticides, plastic, paints, tanning ...etc	-	88	-
Jerash	Foodstuff...etc	-	7	-
Mafraq	Ceramic, cosmetics, gases, tires, printing press, insecticides, paints sponge, fodder...etc	-	39	-
Madaba	Drugs, detergents, polymerization and chemicals, elevators...etc	-	21	-
Aqaba Special Economic Zone	Phosphate, potassium chloride, phosphoric acid, fertilizers, electrical power, timber, cement industries, ordinary potassium, organic and non-organic chemicals, sulfur acid, aluminum fluoride.	2363923 m3/year 472500 ton/year fertilizers and potassium to 656 mw- electrical power.	12	1506

Source: *Civil Defense Directorate.

** Aqaba Special Economic Zone Authority

Table (1-5): Industry Contribution According to Economic Major Sectors

Code ISIC	Industrial Sector	Number of facilities	Total of net employees	Type and resultant pollutants
31	Foodstuff Industries	3837	27086	Industrial wastewater: Oils and lubricants, BOD rise, nitrogenous compounds, TSS. Air pollutants: Dust
32	Textile Industries	669	38411	Industrial wastewater: BOD, TSS, heavy metals, phenol compounds. Air pollutants: Dust, (VOC _s)
33	Timber manufacturing and printing	2459	10608	Industrial wastewater: BOD, TSS, organic solvents, heavy metals. Air pollutants: TSP, VOC _s
34	Paper and its products industries	112	3653	Industrial wastewater: BOD, TSS, Heavy metals. Air pollutants: TSP, SO ₂ , CO, H ₂ S
35	Chemical industries, coal/ petrol - petrochemicals industries - Chemicals industries: fertilizers and insecticides - Oil Refining - Soap and detergents - Chlorine - Drugs	344	17652	Industrial wastewater: BOD Air pollutants: TSP, VOC _s Wastewater: BOD, nitrogenous compounds, TSS, phosphorous compounds, heavy metals, fluoride, phenol, oils, chlorobenzene. Industrial wastewater: BOD, TSS, nitrogenous compounds, phenol, oils, sulfide, chrome. Air pollutants: TSP, ammonia, vapors, F ₂ , HNO ₃ . Industrial wastewater: lead, TSS Air pollutants: TSP, SO ₂ , NO _x , VOC _s Wastewater: BOD, TSS, oils Industrial wastewater: BOD, TSS, phosphoric compounds, oils. Air pollutants: TSP Air pollutants: Chloride
36	Non-metallic mineral products	2609	15046	Industrial wastewater: TSS, oils/for glass industries Air pollutants: TSP SO ₂ , NO _x , CO, VOC ₂ /for glass industries
37	Basic metals industries: Melting and metal formation like: lead, iron, copper and Aluminum	109	3865	Industrial wastewater: oils, heavy metals, cyanide and alkaline. Air pollutants: Metal dusts, TSP, SO ₂ .
38	Assembling machines and equipment	339	3624	Industrial wastewater: Organic solvents, heavy metals. Air pollutants: Metal vapors, VOCs
39	Other industries: Electricity generating stations. Dry cleaning	5 855	3844 1562	Industrial wastewater: BOD, TSS, oils, heavy metals. Air pollutants: SO ₂ , SO ₃ , NO _x , CO, TSP, VOCs

Source: General Statistics Dept.

Chapter Two

Chemicals Production, Import Export, and Use

The aim of this chapter is to give information about the existence of chemicals through production and export and to give information related to chemicals import and uses in the country.

(2-1) Chemicals Production, Import, and Export

1 – Pesticides:

It include agricultural and public health pesticides: Insecticides, and mycology pesticides, fungicides, spiders and herbicides, soil, seeds and stores sterilizers, oils and adhesives; rodenticide and shells, mycology pesticides, veterinary insecticides and household insecticides.

2- Fertilizers:

Includes nitrogen fertilizers, phosphate fertilizers, potassium fertilizers, compound fertilizers, and other fertilizers.

3- Petroleum Products:

These include benzene, kerosene, avtur, diesel, fuel oil, asphalt, white petrol, and liquefied gas and minerals oils.

4- Chemicals as Industrial Raw Materials

It include all materials used in manufacturing chemicals and basic materials, plastics, rubber, paints, inks, pharmaceutical products, pharmacological, chemicals, tires, pipes and rubber and plastic products and batteries.

According to the 2004 annual statistical book, total production qualities in 2004 amounted to (131,1) tons as an average standard for quantitative industrial production. Table No. 2-1 shows the quantities of chemicals produced locally, imported, and exported as per the type thereof:

Table (2-1): Chemicals Production and Marketing

Chemicals Type	Quantity, Produced Locally	Imports	Exports
Pesticides (Insecticides, public health and consumer use) ⁽¹⁾	440 Tons (2003)	968 Tons (2003)	1492 Tons (2003)
Fertilizers ⁽²⁾		36707 Tons solid fertilizer, 674261 liquid fertilizer, germination means 22 million liters (2004)	301492,912 Tons*
Petroleum Products ⁽³⁾ - Crude Oil	3946651 Tons - (2004)	956573 Tons 4245209 Tons (2004)	-
Materials Used in Industry ⁽²⁾ - Organic Solvents - Alcohol - Acids - Gases - Other raw - chemicals		4913.4 Tons 2303.2 Tons 9960.5 Tons 5013.6 Tons 61777.6 Tons	17.1 Tons 2104.1 Tons 1251.3 Tons 212.3 Tons 210487 Tons
Consumer Chemicals: ⁽²⁾ - Paints and Dyes - Paints and Construction Materials - Perfumes and Aromatic Oils - Cosmetics, Dead Sea salts - Shampoos - Tooth Paste and cleaning materials - Deodorants and Bath Fresheners - Soap - Adhesives - Film Developing Materials - Candles - Shoe polish - Furniture / Floor polish - Dish Wash Liquid - Other Items		7664.1 Tons 5166.94 Tons 533.54 Tons 1567.7 Tons 7386.75Tons 349.07 Tons 868.47 Tons 1775.69 Tons 1267.98 Tons 231.97 Tons 63.82 Tons 99.78 Tons 823.86 Tons 3049.58 Tons	8628.75 Tons 1623.66 Tons 187.48 Tons 1083 Tons 399.5 Tons 69.13 Tons 720.14 Tons 16408.9 Tons 1373.71 Tons 20.35 Tons 3.3 Tons 7.37 Tons 6.18 Tons 1718.32 Tons

Source:

- 1- Statistics of Ministry of Agriculture- Pesticides Department 2005.
- 2- General Customs Department for the period from 1/1/2005 – 8/8/2005 (in tons)
- 3- Forty ninth annual report of the Board of Directors of Jordan Petroleum Refinery Company for the year 2004.

(2-2) Chemicals use in Jordan

The following table shows the quantity of different chemicals used in the Hashemite Kingdom of Jordan according to type.

Table (2-2): Chemicals use according to Type

Type of Chemicals	Quantity used in the Kingdom
Pesticides (Agriculture, public health...etc)	481.668 Tons – 1767507 liter ⁽¹⁾
Fertilizers	1811591.5 Tons – 21277 liter ⁽²⁾
Petroleum Products	117.75 Tons ^(*)
Industrial Chemicals	133.4 Tons ^(*)

(1) Source: Agricultural Statistics bulletin of 2004/ General Statistics Dept.

(2) Source: Annual Statistical book for the year 2004 General Statistics Dept.

(3) (*) Previous source/ numbers are average for a monthly standard number for quantitative industrial production.

(2-3) Chemical Wastes

Table (2-3) shows the quantity of different chemical wastes used in the Kingdom according to type.

Table 2-3 Quantities of Chemical Wastes*

* Source: Ministry of Environment, Fichtner/ CEC Co. Survey, 2003

Type of Wastes	Qty of Wastes for 2003	Expected Qty of Wastes 2007
Oils	14784 Tons	5296 Tons
Halogenated Wastes	4 Tons	1 Tons
Solvents	94 Tons	26 Tons
Organic Chemicals	40437 Tons	12188 Tons
Wastes containing mercury	10 Tons	
Pesticide Wastes	103 Tons	32 Tons
- Non Organic Wastes	72102 Tons	9457 Tons
- Non-organic Wastes containing heavy metals or cyanide	1064 Tons	224 Tons
- Ashes + slag	34294 Tons	800 Tons
- Expired used chemicals	987 Tons	1034.5 Tons
- Others (medical, pharmaceutical, asbestos, filter cake and dissolved salts)		

(2-4) Production, import, and export of fixed organic pollutants

This part gives some information about the existence of fixed organic pollutants through productions, export, import, and emission of these materials in Jordan.

(2-4-1) Pesticides

The fixed organic pollutants project is concerned with the following pesticides:

- **D.D.T.**

D.D.T. export and use was banned since 1993. It was permitted to be used only for fighting Malaria until 1995, when it was totally banned. There is an old quantity stored at the Malaria Department, Ministry of Health. These quantities exist in two concentrations:
75% concentration, manufactured in Indonesia.
100% concentration, manufactured in Italy.

The total weight stored for the two concentrations is about 22 tons.

- **Di – Aldreen**

Di- Aldreen is not currently imported as its import and handling were banned in 1993. There is now about 175 liters stored in 7 barrels with a capacity of 25 liters each stored at the Ministry of Agriculture.

- **Lynden (Hexa chlorobenzene)**

Production of this pesticide continued by a local company since 1977 until 2002 (Until the available raw material was consumed) for export purposes to Sudan and Somalia. It was not used and its import was banned in 2001.

- **Hepta-Chlorine**

Import and use of this pesticide was banned in 1995.

- **Toxafine**

A decision was issued by the Ministry of Environment in 2001, banning the import and use of toxafine although the Ministry of Agriculture had prevented its registration since 1980 with the other chloride organic pesticides.

- **Chlordane:**

It is one of pesticides banned from distribution since 1980. It was registered in the 1960s and was not used noticeably.

- **Andren:**

Distribution of this pesticide was banned in Jordan since 1980.

- **Merex:**

These pesticide never registered in Jordan and there's no any quantity used inside Jordan

- **Aldrin:**

Use of this pesticide was banned in Jordan in 1980 in fighting blights and in 1990 its use was also banned in the veterinary field.

(2-4-2) (PCBs)

These materials were used basically as converters oils and electrical condensers before 1980. they used to be imported in the past as built in the converters itself or as spare quantities. Some unused quantities of these oils have been available since 1977 with a volume of almost 1600 liters stored in separate barrels at Al Hussein Thermal Plant in addition to the existence of eight converters now in service and contain 6000 liters approximately, It is worth mentioning that these converters are of the closed system type where no quantity of oil is emitted into the environment during functioning in natural circumstances.

(2-4-3) PCDF / PCDD

These compounds are considered of the organic pollutants that are released or emitted unintentionally or from industrial interactions especially in thermal operations that include organic materials and chlorine as a result of incomplete burning or chemical interactions. Table (2-4) shows a summary of the estimate of emissions of (PCDF/PCDD) resulting from different sectors and the mediums to which these compounds are emitted.

Table (2 – 4) Summary of an estimate of the emissions of PCDF/ PCDD resulting from different sources and mediums to which these compounds are emitted

No.	Category	(Annual Emissions (gm poisoning equivalent / year))						
		Air	Water	Soil	In products	Residuals	Total	%
1.	Wastes incineration	9.365	0.000	0.000	0.000	0.1	9.417	11.5
2.	Production of ferrous and none-ferrous metals.	0.707	0.000	0.000	0.000	2.2	2.857	3.5
3.	Energy production and heating	0.350	0.000	0.000	0.000	0.0	0.350	.43
4.	Mining operations	0.341	0.000	0.000	0.000	0.1	0.417	0.51
5.	Transportation	2.353	0.000	0.00	0.000	0.0	2.353	2.88
6.	Random burning operations	51.204	0.000	0.074	0.000	1.9	53.140	65.1
7.	Production of chemicals and consumer goods	0.000	0.001	0.000	0.345	0.0	0.350	0.43
8.	Miscellaneous	0.002	0.000	0.000	0.000	0.0	0.046	0.06
9.	Disposal of and burning wastes	0.000	0.419	0.000	0.000	12.3	12.672	15.5
Total		64.32	0.42	0.07	0.34	16.44	81.60	100

Source: Ministry of Environment – Report of accidental emissions team 2005 – persistent organic pollutants project.

(2-5) Analysis:

- Although there is some information about the quantities of imported or locally produced chemicals or those used inside the Kingdom and same applies to chemical wastes expected to be produced, yet such information needs to be more accurate and thorough examination to be adopted when taking important decisions based on such information. In order to do that, it is necessary to take some steps, including:
 - Complete the legislations in force and activate the existing ones in order to increase information control.
 - Obligate factories, chemicals importers and other establishments to provide the concerned bodies with necessary information periodically and accurately.
 - Upgrade coordination level between the concerned parties to establish programs according to a unified system for environmental verification, and comprehensive surveys for industrial sectors in order to identify the quantities and types resulting from hazardous wastes, and identify the prevailing methods to deal therewith.
 - Adopt an accurate and integral computerized system for chemicals and the method, objectives and places of their use.
 - Set up a national classification system for hazardous chemical materials and wastes to be approved by all concerned authorities.

Chapter Three

Priorities related to Chemicals Management

This chapter aims at providing an overview of problems associated with the management of chemicals in terms of import, production, export and use, and, where possible, specifying these problems,.

(3-1) Priority concerns related to Chemicals Import, Production and Use

Table (3-1) describes the nature of environmental problems, their causes, and types of chemical pollutants resulting therefrom.

Table (3-1): Description of the nature of environmental problems:

Problem	Area	Brief Description of The problem	Pollutants/ Chemicals
Air Pollution	The Kingdom	There are no comprehensive studies defining the quality of air in the country, but there are studies conducted in specific areas for limited periods. The air pollution problem is confined to "hot areas" resulting from movement traffic; industries, construction works and the geographical nature of the area being a semi arid desert area.	SO ₂ , CO, TSP, lead dust.
	Amman	During 2002, the daily averages of Pb and TSP concentration was observed in four stations in downtown, Shemisani, Abu Nusair and Marka at 34, 34, 34 and 42 samples successively. It was found that TSP concentrations exceeded the limit by 8%, 26%, 3%, 27% of the number of samples taken successively. During the year 2003 the daily averages of Pb and TSP concentrations were observed in four stations, downtown, Shmeisani, Abu Nusair and Marka at 39, 38, 42 and 47 samples respectively – Excesses were found in TSP concentrations at 23%,11%, 13% and 43% respectively of the number of samples taken. The average PM 10 was also observed in one down town station in 2003. The number of samples was 48 and the percentage of excess was 35%. Source: Ministry of Health/Environment Health Department.	SO ₂ , CO, TSP, lead dust.

<p>Air pollution</p> <p>Vehicle Exhausts</p>	<p>Amman</p>	<p>The high increase in the number of vehicles in major cities, especially in Amman and Zarqa, in addition to the topographical nature of some cities like Amman increased the volume of air pollution. The Ministry of Environment launched a campaign in 2003 to measure the exhaust of vehicles, covered 724 vehicles in different areas in Amman to ensure its conformity with the permitted limits of vehicles exhaust emissions, specified in the Jordanian instructions.</p> <p>The study aimed to measure and analyze gases emission from the exhausts of vehicles using benzene where the number of vehicles using regular benzene, covered by the study was 349 vehicles i.e. 48.2%. The vehicles using super benzene were 36 i.e. 5% out of 724 vehicles representing the total sample of the study. The study included also measuring the opacity of vehicles exhausts that use diesel where the number of diesel-operated vehicles covered by the study was 339 vehicles i.e. 46.8% of the total sample.</p> <p>The results showed that (41%) of the vehicles using regular benzene, (44%) of vehicles using super benzene and (46%) of vehicles using diesel only conformed to the relevant Jordan instructions.</p> <p>Source: Ministry of Environment / Air Protection Directorate – vehicle exhausts study 2004.</p>	<p>CO, CO₂, O₂, HC, Opacity</p>
<p>Air pollution</p>	<p>Al Balqaa Governorate</p>	<p>The activities of The Cement Factory in the city of Fuhais lead to some excess in suspended thin dusts during the study period (2003-2004). Dust was examined at three sites, four of which in the four directions encircling the cement factory and the fifth is in a reference site outside the effect of factory dust as follows: Site No. (1) East Site No. (2) West Site No. (3) North Site No. (4) North-northeastern</p>	<p>Suspended thin dusts (PM10)</p>

		<p>Site No. (5) (Reference South eastern)</p> <p>In order to determine the concentration of daily and annual average of suspended thin dusts (PM10), where the total measuring period for the five stations were (759) days at (24 hours/day). The period was distributed on the sites respectively as follows: (133, 161, 157, 160, 148) days/station.</p> <p>Daily average: The results showed that there were (55) excesses beyond the daily average distributed as follows: 13 excesses representing (9.8%) of the measuring period for the station, 13 excesses representing (8.1%) of the measuring period for the station, 15 excesses representing (9.6%) of the measuring period for the station, 7 excesses representing (4.4%) of the measuring period for the station, and 7 excesses representing (4.7%) of the measuring period for the station compared with the daily average specified in the Jordanian specification in (120 mg/m^3) with allowance for three excesses for each consecutive days of observation.</p> <p>Annual averages: The annual averages of the total suspended thin dusts in the air were close to each other and below the limit stipulated in the Jordanian specification (70 mg/m^3) for observation sites except for site No. 4 in which the annual average exceeded the limit slightly (75.2 mg/m^3) and the site 1 in which the excess was clear where the annual average in this site was (98.2 mg/m^3).</p> <p>Source: Measurements of Royal Scientific Society in favor of the Ministry of Environment – 2005.</p>	
Air Pollution	Zarqa Governorate	<p>In Al Hashemiya area there are several sources of air pollution, most important of which are: Al Hussein Thermal Power Plant, Jordan Oil Refinery As-Samra Wastewater Treatment Plant and Metal Smelting and Forming Plant.</p>	<p>SO_2, NO_x, HC, H_2S, TSP, Metallic dust.</p>

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		<p>period was (209) days (24 hours/day) for both stations, (103) days for the first station and (105) days for the second station to identify the concentration of daily average of suspended thin dust (PM10). The results showed the presence of 4.76% of samples of the first station amounting 5 samples and 2.91% of the samples of the second station amounting 3 samples exceeding the Jordanian specification defined by (120 mg/m³). The annual average of PM10 concentration for the period (2003-2004) was 67.25 mg/m³ in the first station and 57.75 mg/m³ in the second station, noting that the annual average defined by the specification is 70 mg/m³.</p> <p>Source: Measurements of Royal Scientific Society in favor of the Ministry of Environment – 2005.</p>	
Air and marine pollution	Aqaba	<p>The existence of fertilizers factories, chemical industries complex, phosphate and potash export activities from Aqaba Port and electricity generation stations cause emissions of different air pollutants.</p> <p>The oil jetty and phosphate terminal lead to emission of marine pollutants</p> <p>Source: ASEZA</p>	TSP, Ammonia, NO _x , SO ₂ , oil and diesel
Pollution of drinking water sources		<p>There is an excess in certain water sources dedicated for drinking water in Jordan, represented in excess in some under-taste properties of drinking water specification No. 286/2001 where a treatment process carried out for it so that it shall be processed within the specification determinants.</p> <p>The water sources in which NO₃ concentration exceeds the specification of drinking water is mixed with water of other sources of better quality with the aim to improve its quality and make it in conformity with the specification.</p> <p>There is a control program that clarifies the</p>	<p>Sulfur</p> <p>Nitrate</p>

		<p>control mechanism conducted by the control departments of the Ministry of Health.</p> <p>Through its executive bodies, the Water Authority also seeks, to draw up strategies and programs that aim to tighten control over different pollution spots and limit them according to the more intense environmental specifications recognized globally and locally.</p>	
Soil Contamination	<p>Zarqa</p> <p>Zarqa/ Marka, the United Co. for Battery Manufacturing</p> <p>Zarqa/ Jordan Training factory's site.</p>	<p>Dumping of chlorine residue, mercury cells in a courtyard near the plant and in rainwater drainage network.</p> <p>The situation was investigated, the Royal Scientific Society in 1991-1995 took samples, which were found to contain high concentration of mercury (42 mg Hg/Kg) in the collected soil samples.</p> <p>The contaminated soils were collected in piles in an area belonging to the adjacent steel plant. A study conducted in favor of the Ministry of Environment by the consultant COWI showed there are about 6000 m³ of such contaminated soil. No action has been taken to remove the pollution in that area.</p> <p>A quantity of lead refuse was dumped in the plant's courtyard. The contaminated soil and the area are not known.</p> <p>Discharge a quantity of sludge containing chrome from tanning process. COWI Consulting estimated the quantity to be 1000 tons in 1994, but no action has been taken in this respect until to date.</p> <p>Source: Ministry of Environment.</p>	<p>Soil contaminated with mercury</p> <p>Pastes and lead dust</p> <p>Sludge containing chrome</p>
Marine pollution	Oils jetty and old phosphate terminal in Aqaba Gulf	<p>Ships destined for Aqaba Gulf are the main cause of Gulf waters pollution.</p> <p>The existence of oil jetty and phosphate terminal causes emissions of seawater pollutants</p> <p>Source: ASEZA</p>	Oil and diesel

Transport	Roads in Jordan	<p>The transportation of chemicals is one of the problems associated with the handling process. In some cases, it is difficult to deal with accidents, in a scientific manner, due to lack of sufficient information of the content of tanks involved in such accidents. This could be attributed to non-activation of the instructions concerning transport of hazardous materials.</p> <p>According to the Civil Defense Directorate, the following accidents were recorded in 2000-2001:</p> <ul style="list-style-type: none"> - Leakage of chemicals during transport because of erosion of one valve. - Falling of a container carrying chemicals belongs to a sponge producing company. - Crash of a tanker and leakage of chemicals. - Crash of a tanker loaded with oils. - Poor storage of an oxygen water container that cause interaction of the substance with the inner walls of the container and the wood and paper enveloping the substance. - Crash of a tanker and leakage of Diethylene glycol in 2003. - Crash of a diesel tanker in 2003. 	<p>Petroleum items</p> <p>Gas cylinders</p> <p>Different chemicals</p>
Import of unknown Chemicals		<p>Chemicals, sometimes, enter Jordan under trade names, which could not be identified properly. Despite the exerted efforts to enforce strict control on chemical imports, yet there is some weakness and deficiency in registering all materials entering Jordan based on the scientific name. In addition, chemicals testing, which is conducted at the Customs Labs, is for customs tariff purposes only.</p>	Different chemicals
Hazardous Wastes Treatment /Disposal		<p>There are no adequate and accurate information on hazardous wastes in Jordan. However, according to the study conducted by Fitchtner/CEC, the hazardous wastes were estimated up to 2003 to be about 112539 tons, and expected to reach 23000 tons in 2007.</p> <p>The hazardous wastes treatment site, which was selected after field survey by consultants and the government in 1989, has not been commissioned yet. Nevertheless, the Ministry of Environment has agreed to receive certain</p>	

		<p>quantities of hazardous wastes from some plants for on-site-storage as a precautionary measure as follows:</p> <ul style="list-style-type: none"> - Organic Solvents – 10.2m³ - Vinyl Acetate mixed with soil – 144 tons - Liquid agricultural pesticides – 3.4 m³ - Aluminum phosphate – 0.45 tons. - Damaged batteries. No. 30 - Asbestos wastes 80 tons - Wastes from the bromine plant 50 tons - Damaged customs materials from Aqaba - Soil mixed with diesel 251 m³. - Expired chemicals 0.01 m³ - Bromine wastes, 54 tons - Developer Solutions, 0.2 m³ <p>Source: Ministry of Environment.</p>	
Occupational Health	Rashadiya	<p>An analytical study has been conducted to show the impact of cement dust on workers at Rashadiya Cement Factory. The study targeted a random group of 315 workers exposed to dust from different sections of the factory: Production Section, Packing, Warehouses. Maintenance, lab, and Mining ...etc. The needed medical tests included: clinical, lung efficiency and audio-graphy. The results were linked to age and years of service in the factory ...etc. The findings showed indicators of relationship between exposures to cement dust, respiratory diseases, ENT diseases and diseases of motion, which appeared after work in the factory. However, there is no information that the employees were suffering from similar diseases previously.</p>	Cement Dust
	Amman	<p>A study was conducted to define the effect of Chrome on the health of workers in the electro-plating Sector (EP). The study covered 118 male workers from the private sector to determine the rate of chrome-vapor in the work environment air and workers' diuresis. The chrome vapor concentrations in the work environment were 84.99 µg/m² higher than the permitted limit (TLV) of 50 µg/m³. The prevalence rate of the associated health disorders were found as follows:</p>	Chrome dust

		<p>- Eye Disorders 78.8 % of those working in the stainless steel module section despite the fact that 63.6 % of them are employed in a work environment in which the Cr-Air Level is higher than the permitted limit (TLV).</p> <p>- Nose Disorders The prevalence rate of nose disorders among workers in the (EP) section and Stainless Steel module Section were 62.9%, 6% respectively.</p> <p>- Skin Disorders: The prevalence rate among workers in the Stainless Steel Module Section was 15.2%, 9% of which are employed in a work environment where chrome concentration exceeds the permitted limit. The prevalence rate of skin disorder among workers employed in EP section was 14.3%, where Cr-air concentrations were below the permitted limit.</p> <p>- Respiratory System Disorders: It was found that 45.7% and 36.4% of workers in the chrome plating section and Stainless Steel Module Section respectively were suffering from chronic and acute disorders in the respiratory system, of which 2.8% and 21.2% respectively were working in an environment with Cr-Air levels above the permitted level. (Source: Ministry of Health – Occupational Health Directorate).</p>	
Public Health		<p>- 148 Malaria cases were recorded in 2001. The problem in question was D.D.T., which was used to fight Malaria until 1995, but its use was banned by the Health Minister and was substituted by other pesticides.</p> <p>- A study was conducted by the Ministry of Health to determine the level of children exposure to "Lead" in Amman. The results showed that lead concentration in children</p>	<p>D.D.T was replaced by Abate. Yet, some of DDT is still stored in the Malaria Section pending finalization of disposal.</p>

		blood residing in downtown Amman is higher than those living in areas with lower concentration at lead in Air. The overall results were within accepted limits.	
Storage/ Disposal of obsolete chemicals		In many factories, there are consumed chemicals, which are stored until operating the hazardous wastes treatment site in Swuqa. Some industries may dispose of these materials in a disorderly manner because there is no possibility to collect large quantities, or to reduce the financial commitments resulting from the transport and treatment measures, or to the ignorance of the consequent negative impact and inefficiency of control of factories in the field of chemicals and chemical wastes.	Different chemicals
Persistent organic pollutants		<p>A lot of persistent organic pollutants were banned by the Ministry of Environment, Ministry of Agriculture and Ministry of Health. A lot of the pesticides in this list were banned since early 1980.</p> <p>The Ministry of Health also banned the importation of PCBs in 1996, in addition that a resolution by the Prime Minister was issued banning the importation of "transformers" containing PCBs.</p> <p>The Central Power Generating Co. has about 1400 liters of consumed oils containing PCBs in its Central Stores, in addition to a quantity of (8) thereof inside the transformers. Source: (Central Electric Generating Co.).</p> <p>Two studies were conducted by the Ministry of Environment during 2002 to 2005 to estimate the quantities of emissions of Dioxin and Furan compounds to the local environment. Table No. (4-2) shows summary of the results of the second study.</p> <p>Currently, the Ministry of Environment, through a national team, is working on preparing the National Work Plan for persistent organic pollutants within the requirements of the Stockholm Convention to eliminate these pollutants.</p> <p>Source: Ministry of Environment- 2005.</p>	<ul style="list-style-type: none"> - Aldrin - Chlordane - Dieldrin - DDT - Heptachlor - Mirex - Toxaphen - Endrin - PCBs - Dioxin - furan

Chemical Residues in Food		<p>The Ministry of Agriculture analysis the effect of chemical residua in vegetables, fruits and agricultural and different agricultural harvests. According to statistics of the Ministry of Agriculture for 2004 the following samples were analyzed:</p> <ul style="list-style-type: none"> - Total imported samples (5566) account for (72.68%) of total samples received by the lab. - Total local samples received from the central market (1543) samples representing (20.15%) of the samples received by the lab. - Total special samples (549)samples, consisting (7.17%), of the samples received by the lab. <p>By analyzing the samples, the following was found:</p> <p>First: Imported samples:</p> <ul style="list-style-type: none"> • (234) samples contain pesticides residues were less than maximum limit which form (4.2%) of total samples. • (5332) samples do not contain pesticides residues which form (95.8%) of total samples <p>Second: Local samples received from the central market:</p> <ul style="list-style-type: none"> • (258) samples contain pesticides residues were less than maximum limit which form (16.7%) of total samples. • (80) Local samples contain pesticides residues were higher than maximum limit which form (5.2)% of total samples. • (1205) local samples do not contain pesticides residues which form (78.1%) of total samples. <p>Source: Ministry of Agriculture.</p>	<p>Groups which are tested:</p> <p>Pyrethroid Compound</p> <p>Organo-chlorinated</p> <p>Organo-phosphorus</p> <p>Carbamite</p> <p>Chlorinated compounds: α-HCH&γ-HCH 0,16%</p> <p>phosphorous 0,16%</p> <p>pyrethroid 0,16%</p> <p>carbamite 0,08%</p> <p>other groups</p>
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Chemical Accidents/Individuals	Different areas in Jordan	<p>A number of accidents associated with handling of chemicals resulting from leakage of interaction of chemicals were recorded during use or storage.</p> <ul style="list-style-type: none"> - Leakage of Ammonia and Nitric Acid in the Directorate of Education Warehouse - Leakage of Chlorine gas in more than one place and establishment. - Leakage of Phosphoric acid - Leakage of Hydrogen peroxide - Chemical evaporations inside a warehouse due to leakage of water thereto. <p>Source: Civil Defense Directorate-2005</p>	<p>Ammonia, Nitric acid, chlorine, gas, phosphoric acid, Hydrogen, peroxide, chemical evaporations.</p>
Chemicals Poisoning	All cities of Jordan	<p>The Environmental Health Directorate receives reports on chemical poisoning cases from health centers and hospitals. The numbers of chemical poisoning cases in respect of which information was recorded were as follows:</p> <ul style="list-style-type: none"> - In 2002 a total of 222 cases were recorded. The highest poisoning cases was (23.87%) because of insecticides. - In 2003 a total of 314 chemical poisoning cases were recorded, the highest poisoning case was (35,27%) of total cases due to poisoning by gases and vapors. - In 2004 a total of 241 cases were recorded. The highest poisoning cases (35.27%) were because of gases and vapors. <p>Up to the end of 2005, 63 chemical poisoning cases were recorded. The poisoning causes are attributed to medicinal reasons, insecticides or plants or animals poisons, petroleum materials, gases vapors, detergents...etc. The reasons of exposure are often un-intentional or occupational reasons. The cases are rarely because of suicide or crimes.</p> <p>It is noted here that such number of cases do not represent the actual cases in the Kingdom.</p>	<p>Pesticides, medicines, snakes and scorpions bites, detergents, petroleum products.</p>

		<p>- 389 chemical poisoning cases were also recorded and transported by the Civil Defense. The rate of medicine poisoning account for about (90%) of these cases. Chemical poisoning cases represent (0.7%) of emergency accidents according to the statistics of Civil Defense Directorate.</p> <p>- The labs and Criminal Evidences Department of the Public Security Directorate examines the poisoning cases, whether death occurs or not, in order to know the type of chemical materials and its ratio in the blood. There is a statistic of the examinations, conducted by the Directorate.</p>	
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The problems associated with chemicals vary in terms of its nature, volume, level of concern and the capability of controlling and solving these problems. Table (3-2) provides additional information and general analysis of the problems, including the determination of priorities of concern.

Table (3-2): Priorities of concerns related to chemicals

Nature of problem	Volume of problem	Level of Concern	Ability to Control the Problem	Availability of Statistical data	Specific Chemical Creating Concerns	Priority Ranking
Air Pollution						
Amman - Downtown	Local	Medium	Low	Insufficient	HC, SO ₂ CO, O ₃	2
Marka & Sahab	Local	Medium	High *1	Sufficient	Lead	1
Fuhais	Local	Medium	High * 1	Insufficient	So ₂ , PM ₁₀	2
Hashimiya	Local	High	High*1	Insufficient	H ₂ S, SO ₂ , PM ₁₀ , HC	1
Aqaba	Local	Medium	Medium	Insufficient	TSP, NO _x , SO ₂ NH ₃	1
Water Pollution	Local	High	Medium			2
Marine pollution	National	High	Medium High 2	Insufficient	Sulfur Phosphate Oils	5 4 5
Groundwater pollution	Local	High	High		Biological refuses No ₃ , TDS, Th	3
Soil pollution	Local	Little	Little	Insufficient	Pesticides and chemicals	4

Chemical residues in food	National	Little	Little	Insufficient	Pesticides and chemicals	3
Drinking water pollution	Local	High	High	Insufficient	Biological refuses NO ₃ , TDS, Th	1
Treatment and disposal of hazardous wastes	Local	High High 2	Little High 2	Insufficient	Different chemicals	3 1 ²
Occupational Health in Agriculture	Local	Medium	Medium	Insufficient	Different pesticides	
Occupational Health in Industry	Local	Medium	Medium	Insufficient	Various chemical pollutants	3
Public Health	Local	Medium High 2	Medium High 2	Insufficient	--	3 1 ²
Industrial chemical Accidents	Local	High	Medium	Insufficient	Various Chemicals	2
Storage/disposal of obsolete chemicals	Local	Medium	Little	Insufficient	Various chemicals	3
Persistent Organic Pollutants	Local	Little	little 3	Insufficient	Chloride pesticides, dioxin, Furan, PCBs	
Unknown chemical imports	National	High	Medium	Insufficient		2
Chemical poisoning	Local	High	Medium	Insufficient	Medicines, pesticides, plant and animal poisons, petroleum products, detergents, gases...etc.	2
Chemical Accidents: Transport	National	High	Medium	Insufficient	Petroleum products and some chemicals	2

- (1) In case the main sources have taken the appropriate corrective measures
- (2) in respect of the Armed Forces
- (3) In respect of Furan and Dioxins
- (4) Source: ASEZA

Degree of importance: from 1-5 where 1: the problem most important, problem with second rank of importance and so on.

(3-2) Analysis

- The pollution problems in the different areas are associated with the nature of its activities. Air pollution is the most notable in areas where industries like cement, phosphate and oil refining are concentrated. In the Agricultural areas, water and soil pollution is mostly prevailing, because of using agricultural pesticides and chemical fertilizers.
- In general, it is noticed that the problem in managing chemicals and dealing with the negative effects resulting therefrom lies in the insufficiency of information related to chemicals as required, in spite of the availability of capabilities of the concerned institutions to identify the priorities related to management of these materials.
- Notwithstanding the attention at the national level of some topics and issues related to chemical management, every governmental body has its own agenda with respect to the determination of priorities linked with such materials in line with its functions. Consequently, the agenda differs accordingly. There is no unified system or mechanism identifying the national priorities according to their significance through which dealing with the said problems would take place clearly by adopting national strategy for the management of chemicals.
- Jordan committed itself to the principles of sustainable development at the Rio De Janeiro Earth Summit in 1992. A practical National Agenda was prepared for the realization of sustainable development for the next century namely Jordan's (21) Agenda. Work on it began in 1996 and it was issued in October 2001.

The agenda, in its various chapters, addressed the following:

- 1- The main challenges of the sustainable development faced by Jordan and the best methods to confront such challenges.
- 2- Propose the national goals and specify the required measures for the realization of these goals.
- 3- Discuss the significant challenges shared by more than one sector and the available tools for facing them in the coming years.
- 4- Method of application of the agenda.

Chapter two of the National Agenda: 21" discussed the integrated management for environment protection and aspects related to water quality, management of wastewater, management of hazardous wastes,

monitoring the quality of air, management of coastal regions areas and public health. As to the chemicals, this issue was mentioned under the hazardous waste management clause. The activities to be implemented for the purpose of management of this subject in an integrated manner were identified.

According to the National Agenda, Zarka area was identified, as an "environmentally hot" area, as a model for commencing the implementation and application of the local agenda, being a densely populated city and surrounded by many industrial activities thereby negatively affecting the surface and underground water resources as well as the quality of air and soil.

Chapter Four

Legal Instruments and Mechanisms Related to the Legislations of Chemicals' Management

This chapter discusses the legislative instruments in Jordan and non-regularity mechanisms related to chemicals management, including the implementation and application mechanisms. It discusses also the points of strength, weakness, and gaps in these instruments and mechanisms and seeking appropriate mechanisms to strengthen and activate general framework of these legislations in order to cover all stages through which chemicals pass, from the moment of its import or production until final disposal.

(4-1) National Legislative Instruments related to Chemicals Management.

Table (4-1) shows references for the national legislative instruments that deal with chemicals management, which clarify the type of legislative instrument, bodies that are in charge of its application, chemicals or related activities that contain these instruments in addition to the purpose of legislation as well as the relevant legal articles and to what extent these instruments are applied.

(4-2) Brief Description of the Basic Legislative Instruments related to chemicals.

The national legislative instruments take different forms such as laws, regulations and the instructions issued in line therewith, and specifications, attached thereto, decisions and technical conditions. The following shows the most important legislative instruments related to chemicals management:

First: Laws

- 1- Temporary Environment Protection Law No. (1) of 2003
- 2- Public Health Law No. (54) of 2002
- 3- Temporary Agriculture Law No. (44) of 2002
- 4- Temporary Law of Transporting goods on roads No. (46) of 2002
- 5- Aqaba Special Economic Zone Law No. 32 as amended of 2000.
- 6- Conducting pharmaceutical studies law No. 67 as amended of 2001

- 7- Temporary medicine and Pharmacy Law No. 80 as amended of 2001
- 8- Crafts and Industries law No. (16), as amended of 1953
- 9- Drugs and Mental Effects Law No. (21), as amended of 1988.
- 10- Export Law No. (21), as amended of 2001
- 11- Labor Law No. (8) as amended of 1996
- 12- Nuclear Energy and Radiation Protection Law No. 29 of 2001
- 13- Civil Defense Law No. (18), as amended of 1999
- 14- Law No. (86) of 2003 amending Civil Defense Law.
- 15- Customs Law No. (20), of 1998
- 16- National Resources Regulating Law, as amended No. (12), of 1968
- 17- Free Zones Corporation Law No. (32), as amended of 1984
- 18- Standards and Metrology Law No. (22) of 2000
- 19- Temporary Traffic Law No. (47), of 2001
- 20- Jordan Valley Development Law, as amended of 1988
- 21- Transportation Law No. (89) of 2003
- 22- Food and Drug Administration Temporary Law No. (31) of 2003
- 23- Ports Authority Law No. (36) of 1985
- 24- Ministry of Industry and Trade Law No. (18), as amended of 1998.

Second – Regulations

- 1- Regulation of management, transport and handling of harmful and hazardous materials No. (24) of 2005 issued in accordance with the Environment Temporary Protection Law.
- 2- Amending Regulation on the protection of marine environment and coasts Regulation No. 23 of 2005, issued in accordant with Temporary Environment Protection Law
- 3- Solid wastes Management Regulation No. 27 of 2005 issued in accordance with Temporary Environment Protection Law
- 4- Soil Protection Regulation No. 25 of 2005, issued in accordance with Temporary Environment Protection Law
- 5- Environment Protection from Pollution Regulation in emergency cases No. 26 of 2005, issued in accordance with Temporary Environment Protection Law
- 6- Air Protection Regulation No. 28 of 2005, issued in accordance with Temporary Environment Protection Law
- 7- Natural Reserves and National Parks Regulation No. 29 of 2005, issued in accordance with Temporary Environment Protection Law.
- 8- Environmental Impact Assessment Regulation No. 37 of 2005 issued in accordance with Temporary Environment Protection Law.

- 9- Import and Export Licenses and Cards Regulation No. 114 of 2004, issued in accordance with the Import and Export Law.
- 10- Occupational Safety and Health Committees and Supervisors Formation Regulation No. 7 of 1998, issued in accordance with the Labor Law.
- 11- Customs Labs Regulation No. 59 of 1969, issued in accordance with amended Customs Law No. 16 of 1969
- 12- Ships Regulation No. 51 of 1961, issued in accordance with Aqaba Port Law
- 13- Quarries Regulation No. 8, as amended, of 1971, issued in accordance with the Natural Resources Regulating Law, as amended
- 14- Free Zones Investment Regulation No. 43 of 1987, issued in accordance with the Free Zones Corporation Law, as amended
- 15- Regulation for organizing the developing investment environment of Aqaba Special Economic Zone No. 11 of 2001, issued in accordance with ASEZ Law, as amended.
- 16- Regulation for registering and licensing establishments in Aqaba Special Economic Zone No. 13 of 2001, issued in accordance with ASEZ Law, as amended.
- 17- Environmental Protection Regulation in Aqaba Special Economic Zone No. 21 of 2001, issued in accordance with Aqaba Special Economic Zone Law, as amended.
- 18- Customs Regulation in Aqaba Special Economic Zone No. 9 of 2001, issued in accordance with Aqaba Special Economic Zone Law, as amended.
- 19- Regulation for Medical Preventive and Therapeutic Care for workers in the establishments No. 42 of 1998, issued in accordance with the Labor Law.
- 20- Regulation for the protection and safety from machines, and industrial machines and work sites No. 43 of 1998, issued in accordance with the Labor Law.
- 21- Hazardous Materials and Mental Effects Regulation No. 79 of 1999, issued in accordance with Drugs and Mental Effects Law, as amended
- 22- Shipping Agents Works Organizing Regulation No. 46 of 2003, issued in accordance with the temporary law of transporting goods on roads.
- 23- Licensing Carriers and Shipping Agents Regulation No. (45), as amended of 2003, issued in accordance with the temporary law for transporting goods on roads.
- 24- Regulation of the discharge, storage and clearing goods from Aqaba Port No/ (25) of 1998 issued in accordance with the Ports Authority Law as amended.

Third: Instructions:

- 1- Instructions for Handling Hazardous Wastes Instructions of 2003 issued in accordance with the Temporary Environment Protection Law.
- 2- Used Oils Management and Handling Instructions of 2003
- 3- Ozone Depletion Materials Use Control Instructions of 2003.
- 4- Medical Wastes Management Instructions of 2001 issued in accordance with Article (23) Clause (13) of the Private Hospitals Regulation No. (65) as amended of 1980, and in accordance with Article (12) clause (d)) of medical Labs Licensing and Management regulation No. (23) of 1982, as amended.
- 5- Instructions for Protecting Workers and establishments from work environment 1998 issued under the Labor Law, as amended.
- 6- Instructions for Periodic medical checkup of workers in establishments of 1999 issued in accordance with the Labor Law, as amended and in accordance with the regulation of preventive and therapeutic medical care for workers in establishments No. 42 of 1998.
- 7- Instructions for primary medical examination for workers in establishments of 1999 issued in accordance with the Labor Law, as amended and in accordance with the regulation of preventive and therapeutic medical care for workers in establishments No. 42 of 1998.
- 8- Instructions for transporting hazardous or explosive materials of the Temporary Traffic Law, as amended.
- 9- Instructions for licensing carriers for carrying out transport of crude oil and its derivatives by tankers, as amended of 2003, issued in accordance with the regulation for licensing carriers and shipping agents No. (45) of 2003.
- 10- Instructions for the storage and investment in free zones as amended of 1993, issued in accordance with the free zones investment regulation No. (43) of 1987.
- 11- Instructions for organizing the transport, storage, manufacture use and trade in organic fertilizer of 2003 issued in accordance with the Temporary Environment Protection Law No. (1) of 2003.
- 12- Instructions for the import and export to Aqaba Special Economic Zone No. (47) of 2002 and attachments No. (1, 2, 3, 4, 5, 6, 7) issued in accordance with Aqaba Special Economic Zone Law No. (32), as amended of 2002.
- 13- Instructions for the works of the environment judicial police procedures No. (13) of 2001 issued in accordance with the environment protection Law in Aqaba Special Economic Zone no. (21) of 2001.
- 14- Instructions for forming the committee for evaluating damage to the environment, identifying its duties and organizing its meetings at ASEZ, as amended No. (37) of 2001 issued in accordance with the environment protection regulation in ASEZ No. (21) of 2001.

- 15- Instructions for organizing the circulation and handling of plastic bags, at ASEZ No. (48) of 2002, issued in accordance with the environment protection regulation in ASEZ No. (21) of 2001.
- 16- Instructions for analyzing and lab testing of raw fodder, processed fodder and fodder additives for 2003, issued in accordance with Temporary Agriculture Law No. (44) of 2002.
- 17- Instructions for registering, manufacturing, preparing importing, handling and trading in pesticides No. (G/22) of 2003, issued in accordance with the Temporary Agriculture Law No. (44) of 2002.
- 18- Instructions for controlling agricultural products quality No. (28) of 2003 issued in accordance with the Temporary Agriculture Law No. (44) of 2002.
- 19- Instructions for registering agricultural fertilizers and plants growth regulators and its procedures No. (G/29) of 2003, issued in accordance with Temporary Agriculture Law No. (44) of 2002.
- 20- Instructions for analyzing testing and examining fertilizers and plants growth regulators No. (30) of 2003.
- 21- Instructions for the conditions of importing plants fertilizers and growth regulators No. (31) of 2003 issued in accordance with the Temporary Agriculture Law No. (44) of 2002.
- 22- Instructions for licensing conditions to produce prepare, store, handle and trade in fertilizers and plant growth regulators No. (32) of 2003 issued in accordance with the Temporary Agriculture Law No. (44) of 2002.
- 23- Instructions for manufacturing, registering, licensing and handling veterinary medicines biological preparations and animal growth regulators No. (G/33) of 2003, issued in accordance with the Temporary Agriculture Law No. (44) of 2002.
- 24- Instructions for licensing agricultural pesticide spraying offices and shops, No. (G/47) of 2003, issued in accordance with the Temporary Agriculture Law No. (44) of 2002.
- 25- Instructions for health conditions for producing plastic materials, used for foodstuff, medicines or drinking water of 1997, issued in accordance with Crafts and Industries Law.
- 26- Instructions for inspecting imported products, based on risk degree No. (4) of 2003, issued in accordance with the Standard and Metrology Law.
- 27- Instructions for foodstuff and chemicals examination charges No. (1) of 2004, issued in accordance with the Standard and Metrology Law.
- 28- Instructions for discharge loading and storage of goods No. (25), as amended of 1998, issued in accordance with regulation for the discharge, storage and clearing of goods from Aqaba Port No. (25) of 1998, issued in accordance with the decision of the board of directors of the Ports Authority No. (50/98).

- 29- Instructions for the guiding labels related to transporting hazardous and explosive materials No (2) of 2004, issued in accordance with the Civil Deference law No. (18) of 1999. and by virtue of the instructions for transporting hazardous and explosive materials of 2001.

Fourth: Tables and Specifications:

- 1- Table amending the table of permitted threshold limits for workers exposure to chemicals issued in accordance with the Labor Law, as amended and pursuant to the regulation of prevention and safety from industrial machines and machinery and places of work.
- 2- Table (list) of occupational diseases, which result in compensation, and issued in accordance with the Labor Law, as amended.
- 3- Tables and lists that include many standard specifications of the quality of water, air and soil and maximum limits permitted for chemical pollutants and methods of measurement thereof.

Fifth: Decisions:

- 1- Decision of Minister of Labor regarding hazardous, onerous works or works harmful to juveniles health 1997, issued in accordance with the Labor Law, as amended.
- 2- Decision of Minister of Labor regarding the works and times, during which women are not permitted to work for the year 1997 issued in accordance with the Labor Law, as amended.
- 3- Decision for applying Crafts and Industrious Law of 1961.
- 4- Decision of adding and transporting materials to the list of mental effecting narcotics of 1997, Decision the drugs and narcotics Law, as amended.
- 5- Decision of adding materials to the drugs table of 2000, issued in accordance with the drugs and mental effects Law, as amended.
- 6- Decision issued in accordance with the drugs and narcotics Law, of 2003, issued pursuant to the drugs and narcotics Law, as amended.
- 7- Decision issued by the Minister of Health and published in the Official Gazette No (47/7) published on 16/8/2005, in which he determines the prohibited and conditioned chemicals.

Sixth: Conditions:

- 1- Public health conditions for licensing food plants and factories of 1995, issued in accordance with the Crafts and Industries Law, as amended.
- 2- Necessary basics and requirements for licensing the agencies and approving labs of 2003, issued in accordance with temporary law of conducting pharmaceutical studies, as amended.

Table 4-1: References of National Legal Instruments related to Chemicals Management

Legal Instrument	Responsible Ministries or Bodies	Chemicals Use	Objective of Legislation	Relevant Articles/Provisions	Application Effectiveness
Temporary Environment Protection Law No. (1) of 2003	<ul style="list-style-type: none"> -Ministry of Environment. - Relevant Parties 	Harmful and hazardous chemicals, pollutants and wastes	<ul style="list-style-type: none"> - Protection of environment and its components within safe limits and promote it and prevent its deterioration, contamination or violation. These components include air, water, soil and eco system. - Cooperate and coordinate with concerned bodies in respect of the Environment at the local, Arabic and international levels with the aim to protect environment's components and elements against pollution and to implement Environment – related agreements 	Article (4/g) Article (5) Article (6/a/b/1/2/c) Article (7/a/b/1/cd) Article (8/a/b) Article (11/a/1/2/b) Article (13/a/b) Article (14) Article (15) Article (16) Article (17/a/b/c)	Effective
Regulation for the Management, transport and handling of Harmful and Hazardous Materials No. (24) of 2005	<ul style="list-style-type: none"> - Ministry of Environment - Ministry of Industry and Trade. - Ministry of Finance/ Customs Department - Ministry of Water and Irrigation - Ministry of Agriculture. - Ministry of Health. 	<ul style="list-style-type: none"> - Harmful & Hazardous materials. - Harmful & Hazardous wastes. - Banned Materials. - Restricted Materials. 	<ul style="list-style-type: none"> - Classification of harmful, hazardous, banned and restricted materials and their wastes. - Preparing the instructions related to specifying the rules, conditions, and scientific means of methods necessary for transporting, collecting, and storing harmful and hazardous materials and treating and disposing of their wastes. - Approving clearance forms related to the handling of hazardous materials and wastes and the period of validity of each of them. - Approving the forms related to 	All Articles	Effective

			collecting and disposing of harmful and hazardous materials and their wastes and allocating sites for such purpose. - Any other issues that need specialized technical studies.		
Amending Regulation to Marine Life and Coasts Protection Regulation No. (23) of 2005	- Ministry of Environment	Harmful hazardous materials according to legislations in force, and international marine organization regulations and international classification of these materials	Prevent negative effect to marine environmental and its sources directly or indirectly, whether visible or invisible, which would affect its life a aquatic to limit its use, devalue or exterminate it totally.	All Articles	Fair
Regulation for solid wastes management No (27) of 2005	- Ministry of Environment	Solid wastes, which include: Solid wastes and semi-solid wastes resulting from any activities to be treated or disposed of and not listed in the definition of harmful and hazardous wastes stated in the Regulation for management, transport and handling of harmful and hazardous materials	Organizing solid wastes management in a manner that protects the environment and public health.	All Articles	Fair
Regulation for Soil Protection No. (25) of 2005.	- Ministry of Environment. - Ministry of Agriculture.	Pesticides which include: Materials or preparations used for protection against plant epidemic or for compacting plant diseases, pests, weeds or other creature harmful to plants as well as materials and preparations used for fighting insects harmful to public health, insects and external parasite harmful to animals. Fertilizers, which include: Materials that could be added to	- To lay down a comprehensive environment plan for the protection of soil and to specify the optimal exploitation of lands - To monitor and control environment pollution sources to the limit permitted environmentally in conformity with standard specifications and the standards recognized locally.	All Articles	Fair

		soil to improve its characteristics, or to plants to improve its growth and the materials, that form a suitable medium for multiplication or cultivation whether they are chemical, organic or biological.			
Regulation for protection of the environment from pollution in emergency cases No. (26) of 2005	<ul style="list-style-type: none"> - Ministry of Environment. - National committee for environment protection against pollution in emergency cases. - Most ministries 	All hazardous chemicals and their wastes.	<ul style="list-style-type: none"> - To lay down the plan related to environment protection and pollution and fighting pollution in emergency cases, and the methods of implementation thereof with due observance of the protocols related to international all regional cooperation to which Jordan is a party in this respect. - To establish an environmental information bank for hazardous materials in Jordan. 	All Articles	Fair
Air protection Regulation No. (28) of 2005	<ul style="list-style-type: none"> - Ministry of Environment 	<ul style="list-style-type: none"> - Air pollutants that enter the air and atmosphere and lead to changing its natural characteristics in quantities that harm human, animal, plant, water or soil. - Medical wastes resulting from the activities of health medical care institutions, whether from diagnosis, therapy or research. 	<ul style="list-style-type: none"> - To obligate institutions when carrying out their activity to limit the emission and leakage of air pollutants in quantities exceeding the maximum limit permitted in accordance with the approved technical rules. - To classify the institutions causing air pollutants according to the quality and quantity of pollutants and its effect on the environment and public health. - To specify the areas exposed to air pollutants and necessary control measures to prevent or limit any harm to the environment. 	All Articles	Effective

Regulation for the Natural Reserves and Parks No. (29) of 2005	- Ministry of Environment		To protect environmental areas (areas of lands, sea or water planes that enfold a distinguished environment systems or wild creatures threatened by extinction from the damages that might arise as a result of unfair use of natural resources	Some Articles	Fair
Environmental Impact Assessment Regulation No. (37) of 2005	- Ministry of Environment	All materials that endanger environment components, living creatures and plants.	To conduct an environmental evaluation for industrial, agricultural and construction projects and to give approval to project owner to state implementation of his project after studying it by a technical committee.	All Articles	Effective
Instructions for management and handling of hazardous wastes of 2003	- Ministry of Environment	Solid, liquid or gaseous wastes, characterized by its toxicity or flammability or ability to explode or cause corrosion of materials or have dangerous characteristics that could have negative effects on public health or environment components in their separate form or when mixed with other wastes.		All Articles	Effective
Instructions for management and handling of used oils of 2003	- Ministry of Environment - Institution of Standards and Metrology - Civil Defense Directorate	Oils refined from crude oil or synthetic oils and used or the cycle use thereof expired so that they became a waste contaminated by chemicals or physical pollutants should be disposed of, treated or reused such as machine oils, hydraulic motors, energy transmission, dynamic, gears, thermal exchange or any oils used for lubrication or a blend therefrom, excluding oils where PCBs exceeds 50 part of a million	Management of consumable oils during production, transport, collection, storage, treatment, and burning as fuel, including application of the stipulations for the health and safety of those engaged in oils.	All Articles	Effective

Instructions for controlling the use of Ozone depleting materials of 2003	<ul style="list-style-type: none"> - Ministry of Environment. - Other official bodies 	Materials harmful to ozone layer	Protection of the ozone layer pursuant to Vienna Convention and Montreal Protocol.	Articles (3-20)	Effective
Instructions for organizing the transport, storage, production, trade in and use of organic fertilizer of 2003.	<ul style="list-style-type: none"> - Ministry of Environment. - Ministry of Health. - Ministry of Agriculture. - Ministry of Water & Irrigation 	<ul style="list-style-type: none"> - Processed organic fertilizer. - Metal organic fertilizer. 	Management, Organizing, storage, manufacturing and Trade in organic fertilizer	Articles (3-23)	Effective
Public Health Law No. (54) of 2002	<ul style="list-style-type: none"> - Ministry of Health. - Municipality of Greater Amman. - Ministry of Environment & Food Drug Administration. 	<ul style="list-style-type: none"> - Chemicals pollutants in general. - Chemicals with effects on health. 	Safeguarding public Health.	Chapters (9-11), (16), (18)	Effective
Instructions for medical wastes management of 2001	<ul style="list-style-type: none"> - Ministry of Health 	<ul style="list-style-type: none"> - Hazardous medical wastes such as: - Residue of medicines and drugs. - Residua of chemicals. - Residua of toxic materials cells. 	Control management of medical wastes resulting from different health care institutions in the public and private sectors, research centers, drugs warehouses and plants and veterinarian clinics starting from partition and ending up in disposal of them.	Article (3-7)	Effective
Temporary Agricultures Law No. (44) of 2002	<ul style="list-style-type: none"> - Ministry of Agriculture 	<ul style="list-style-type: none"> - Agricultural products and production inputs. - Fertilizers and plant growth regulators. - Pesticides used in fighting plant epidemic 	<ul style="list-style-type: none"> - Organize import and export of agricultural products and production inputs. - Ensure licensing fertilizers and plant growth regulators and register them with the Ministry of 	Article (9/a, b) Article (20/a, b) Article (21/a, b) Article (22/a/6) Article (9/a, b)	Effective

		and plant quarantine. - Drugs and bio-veterinary preparations. - Empty Pesticides containers.	Agriculture. - Ensure licensing of pesticides and their registration with the ministry of Agriculture. - Organize seizure of chemical instruments and materials. - Ensure licensing of drugs and veterinary biological preparations with the Ministry of Agriculture and organize their entry into the Kingdom and their clearance.	Article (45/a, b) Article (61)	
Instructions for the analysis and lab testing of raw fodder and processed fodder No. (15), 2003	- Ministry of Agriculture	Raw fodder, processed fodder and fodder additives.	Adopt international specifications and Jordanian standards for conducting lab tests and analyses.	Most Articles	Effective
Instructions for the registration, preparation, import, handling and trade in pesticides and the amendments thereof No. (22) of 2003	- Ministry of Agriculture	Pesticides and the preparation, import, handling and trade in them.	Registration of pesticides for the purposes of permitting their use in the Kingdom, including cancellation of their registration and return them.	Most Articles	Effective
Instructions for quality control of agricultural products No. (28) of 2003.	- Ministry of Agriculture		Quality control of agricultural products		Effective

Instructions and procedures for the registration of agricultural fertilizers and plant growth regulator No. (29) of 2003	- Ministry of Agriculture	Agricultural fertilizers and plant growth regulators	Registration of agricultural fertilizers and growth regulators prior to import production, selling or display.	Most Article	Effective
Instructions for analysis, testing and examining fertilizers and plant growth regulators No (30) of 2003	-Ministry of Agriculture.	Fertilizers and plant growth regulators	Adopt the specification and standards related to analysis of fertilizers and plant growth regulators and the percentage permitted to be exceeded	Article (3.4)	Effective
Instructions for the conditions of importing fertilizers and plant growth regulators No. (31) of 2003	-Ministry of Agriculture.	Fertilizers and plant growth regulators	Ensure that the license is obtained before importing agricultural fertilizers and comply with the instruction and conditions that should be satisfied by the one who practice the import profession.	All Articles	Effective
Instructions for the conditions for the production, circulation, trade in and advertise fertilizers and plant growth regulators No. (32) of 2003	- Ministry of Agriculture	Fertilizers and plant growth regulators	<ul style="list-style-type: none"> - Ensure obtaining a license before producing agricultural fertilizers. - Comply with standard specifications of agricultural fertilizers permitted to be circulated. - For licensing agricultural fertilizers and growth regulators production shops and trading in them and packages conditions. - Conditions for agricultural fertilizers sale and storage shops 	All Article	Effective

Instructions for producing veterinary drugs, biological preparations, animal growth regulators and registering, licensing and handling them No. (33) of 2003	- Ministry of Agriculture	<ul style="list-style-type: none"> - Veterinary drugs. - Biological preparations. - Animal growth regulators. 	Preventing the manufacture, import, distribution or export of medicines and plant growth preparations and regulators without a license from the Ministry of Agriculture.	Most of Article	Effective
Instructions for licensing agricultural pesticides spraying offices and shops No. (47) of 2003	- Ministry of Agriculture	- Agricultural pesticides	Conditions for licensing agricultural pesticides spraying offices and shops	All Articles	Effective
Temporary Law for transporting goods on roads No. (46) of 2002	- Ministry of Transport	All types of goods including hazardous materials.	<ul style="list-style-type: none"> - Regulating the transport of goods on roads in terms of: - Obtaining a license to practice transportation works on roads in the Kingdom. - Obligate the carrier to transport goods by trucks suitable for the nature of goods 	Article (4-7) Article (9) Article (11) Article (20)	Effective
Regulation for licensing carriers and shipping agents and its amendments No. (45) of 2003	- Ministry of Transport	All types of goods including hazardous materials,	<ul style="list-style-type: none"> - To grant the carrier and shipping agent: - The license once he is registered under the provisions of Companies Law or Commercial Register Regulation in force. - Prove ownership of at least ten trucks in the required specifications. - Obligate the carrier and shipping agent to provide information and statistics related to working in goods transports field. 	Some Articles	Effective

Instructions for licensing carriers to carry out transport of crude oil and byproducts by tankers and its amendments of 2003	<ul style="list-style-type: none"> - Ministry of Transport - Ministry of Energy and Mineral Resources. - Ministry of Interior. - Public Security - Civil Defense. 	Crude oil and its byproducts	<ul style="list-style-type: none"> - To specify the conditions required for the license to carry out transport of crude oil and its byproducts. - To comply with the instructions of tender's specifications to be satisfied in transport tankers, issued by the Ministry of Interior in 2002. - To comply with the instructions related to public safety condition to be satisfied by the crude oil transporting tankers, issued by the Ministry of Energy and Mineral Resources and other official authorities. - To comply with the instructions of Civil Defense Directorate regarding the guiding labels. 	Articles (4, g) Article (10)	Effective
ASEZ Law No. 32, of 2000, as amended	<ul style="list-style-type: none"> - ASEZA - Board of Commissioners 	All imported chemicals (import)	Enforce economic capabilities of ASEZ	Article (1, 5, 6, 7, 9, 10/b) Article (25/9) Article (26/9) Article (29) Article (52) Article (53/a) Article (54/b)	
Regulation for organizing and developing the investment environment for ASEZ No. (11) of 2003	<ul style="list-style-type: none"> - ASEZ - Board of Commissioners 	Activities that need a permit for commencing work.	This regulation aims to provide the investment environment in Aqaba Special Economic Zone	Article (4/a) Article (8/a)	Effective

Regulation for registering and licensing establishments in Aqaba special Economic Zone No. (13) of 2001	- ASEZ	Chemicals are among prohibited and restricted activities.	Controlling the registration and licensing of the establishments engaged in prohibited activities.	Article (5/a)	Effective
Regulation for protecting the environment in ASEZ No. (21) of 2001.	- ASEZ - Environmental Organization Department at ASEZA	- Hazardous materials - Hazardous wastes - Oils - Oil Mixture	Environment protection in ASEZA	Most Articles	Effective
Customs Regulation in ASEZ No. (21) of 2001	- ASEZA	Imported and exported chemicals/ goods	Organizing customs, import and export operation.	- Article (7/a) - Article (8/37/a, 44/a)	Effective
Import and export instructions for ASEZ No. (47) of 2002	- ASEZA	Hazardous Materials	Organizing import operations	- Article (3/c) - Article (4/a, b) -Article (6, 7, 11/a, b) -Article (15/a/2) - Article (16) - Special annexes Nos. (1, 2, 3, 4, 5, 6, 7)	Effective
Instructions of work procedures of environment judicial police No. (13) of 2001	- ASEZ - Environment affairs commissioner		Specifying the procedures and powers of judicial police	All articles show work of judicial police	Effective

Instructions for forming environmental damages assessment committee at ASEZ, specifying its duties and organizing its meetings No. (37) of 2002, as amended	<ul style="list-style-type: none"> - ASEZ Commissioner Board. - Director of Environment supervision and implementation Dept. 	Pollutants (Oils, hazardous materials, hazardous wastes, harmful materials, harmful liquid materials)	Assessment of damages resulting from environment accidents in ASEZ	All articles show mechanism of work of the committee	Effective
Instructions for organizing the handling and dealing with plastic bags in ASEZ No. (48) of 2002	<ul style="list-style-type: none"> - ASEZ 	Plastic bags	Controlling the distribution of plastic bags in Aqaba	Some articles	Effective
Temporary Law of conducting medicinal studies No. (67) of 2001, as amended	<ul style="list-style-type: none"> - Ministry of Health - FDA 	Medicine	Controlling therapeutic and non-therapeutic medicinal studies	Some articles	Effective
Temporary Medicine and pharmacy Law and its amendments No. (80) of 2001	<ul style="list-style-type: none"> - Ministry of Health - FDA 	Medicine	<ul style="list-style-type: none"> - Controlling the distribution, registration, import and manufacture. - Controlling the distribution, storage and transport of raw materials used in medicine industries. - Licensing drugs factories and basics of pharmaceutical manufacturing or conditions to be met in drugs factories. 	Articles (3/2, 1, 17, 18, 28, 40, 4, 44, 56, 57/b/5, 80/c, 87/b)	Effective

Crafts and Industries Law No. (16) of 1953, as amended	<ul style="list-style-type: none"> - Ministry of Health. - Ministry of Municipal Affairs. - Municipality of Greater Amman 		Organizing work in industrial, and craft sectors by setting health conditions for managing industrial and craft corporations	Articles (12,14)	Effective
Instructions for hygienic conditions for production used plastic materials for foodstuff and medicine or drinking water of 1998	<ul style="list-style-type: none"> - Ministry of Health 	Paper, glass and plastic ...etc	Clarify the hygienic conditions that ought to be available in manufacturing plastic materials used in foodstuff and medicine industries.	Articles (6.3.2)	Effective
Resolution for the application of crafts and industrial Law of 1961	<ul style="list-style-type: none"> - Ministry of Health 		Setting conditions for establishing frozen food factories	Articles (1, 6, 13)	Effective
General health conditions for licensing food plants and factories of 1995.	<ul style="list-style-type: none"> - Ministry of Health 		State the condition for licensing food plants.	Articles (12, 1, 11, 24, 23, 20, 18, 16)	Effective
Law of Drugs & narcotics No. (11) of 1988, as amended	<ul style="list-style-type: none"> - Ministry of Interior - Ministry of Health - Anti-Drugs/ Dept. 	Narcotics and mental effects	Protect individuals through control of the import, export, production, planting, trafficking and taking narcotics and materials of mental effects.	Most Articles	Effective
Regulation of hazardous materials and mental effects No. (79) of 1999	<ul style="list-style-type: none"> - Ministry of Health 	Narcotics and mental effects	Protecting individuals through controlling import, export, manufacture, planting, trafficking and taking narcotics and mental effects materials	Most Articles	Effective

Resolution for adding and transferring articles to the mental effects table of 1997	<ul style="list-style-type: none"> - Ministry of Interior. - Ministry of Health. - Anti-Drugs Dep. 	Narcotics and mental effects	Update mental effects tables	Article (1)	Effective
Resolution for adding articles to drugs table of 2000	<ul style="list-style-type: none"> - Ministry of Interior. - Ministry of Health. - Anti-Drugs Dep. 	Narcotics and mental effects	Update mental effects tables.	Article (1)	Effective
Resolution issued in accordance with the Drugs and mental effects Law of 2003	<ul style="list-style-type: none"> - Ministry of Interior. - Ministry of Health. - Anti-Drugs Dep. 	Narcotics and mental effects	Add articles to drugs tables	Article (1)	Effective
Import and Export Law No. (21) of 2001, as amended	<ul style="list-style-type: none"> - Ministry of Industry & Trade - Ministry of Health. - Ministry of Environment - Ministry of Agricultural - Municipality of Greater Amman - Public Security - Customs Dept. 	Chemicals in general	Imports and exports Control	Article (5/a,6) Article (6/a,6)	Weak
Import and Export Licenses & Cards. Regulation No. (114) of 2004.	<ul style="list-style-type: none"> - Ministry of Industry and Trade 	Chemicals in general	Granting import and export licenses	Articles (4-7) Articles (9-10) Articles (15/a)	Weak
Labor Law No. (8) of 1996, as amended	<ul style="list-style-type: none"> - Ministry of Labor 	All chemicals used in any stage of work	Provide occupational safety and health in the work environment to ensure safety of workers.	Articles (74,69) Articles (79,78) Articles (85,90)	Effective

Regulation for Forming occupational safety and health committees and supervisors No. (7) of 1998	- Ministry of Labor	All chemicals used in any stage of work	Appoint a cadre specialized in occupational safety and health in the establishments based on the number of workers and comply with occupational safety and health at worksite		Effective
Regulation for preventive and therapeutic care for workers in establishments No. (42) of 1998	- Ministry of Labor	All chemicals used in any stage of work	Appoint a specialized preventive and therapeutic cadre in the establishments based on the number of its employees and comply with preventive health standards at the worksite	Article (8,6,4,3)	Fair
Regulation for the protection and safety against industrial machinery, machines and worksites No. (43) of 1998	- Ministry of Labor	All chemicals used in any stage of work	Clarify measures and precautions for protection and safety against mechanical, electrical and chemical risks at worksites	Articles (10, 9, 8,6,5)	Fair
Instructions for periodic medical checkup for workers in establishments of 1999	- Ministry of Labor	All chemicals used in any stage of work and adversely affect workers' health	Identify industrial sectors covered by periodic medical examination of workers and the period of examination as per a unified form	Articles (3, 4)	Fair
Instructions for primary medical checkup for workers in establishments of 1999	- Ministry of Labor	All chemicals used in any stage of work and adversely affect workers' health	Identify industrial sectors covered by primary medical examination of workers and the period of examination as per a unified form	Articles (2, 3)	Fair

Resolution issued by the Minister of Labor pertaining to dangerous, onerous or detrimental to juveniles health of 1997	- Ministry of Labor	A number of chemicals endangering women health	Identify the works and times during which employment of those who are under seventeen years of age is prohibited	Article (2)	Fair
Resolution issued by the Minister of Labor pertaining to works and times during which women employment is prohibited of 1997	- Ministry of Labor	A number of chemicals endangering women health	Identify the works and times during which women employment is prohibited	Article (3, 2)	Effective
Amended table of the permissible "threshold limits" for workers exposure to chemicals	- Ministry of Labor	(750) different chemicals	Control of exposure of individuals' protection by identifying the "threshold" limits of about (750) chemicals to ensure that acceptable limits for chemicals are not exceeded at the work environment		Weak
Table of industrial diseases entailing compensation	- Ministry of Labor	A number of chemicals, the continuous exposure to which causes injury by one kind of occupational diseases associated with the exposure to such material	Identify the diseases considered occupational and for the injury of which the workers is entitled to compensation		Weak
Nuclear Energy and Radiation Protection Law No. (29) of 2001	- Ministry of Energy and Mineral Resources. - Jordan Atomic Energy Commission.	- Medicine. - Scientific Research.	Control of the use of different types of radiation in terms of approval, operation or management of any institution that uses radioactive materials with the aim to help workers and those exposed to radiation levels.	Article (15/1-2-3) Article (18/a,6)	Effective

Civil Defense Law No (18) of 1999, as amended	- Directorate of Civil Defense.	All chemical radioactive and bacterial materials	Protection and confronting risks resulting from chemicals (transport, handling, leakage, storage and fire)	Clause (1-3) of Article (8) clauses (b – d, 5, f, g, k) of Article (13) clause (a-1) of Article (14)	Effective
Law No. (86) of 2003 amending the Civil Defense Law	- Directorate of Civil Defense.	All Chemicals	The risks resulting from chemicals (transport, handling, leakage, storage and fire)	<ul style="list-style-type: none"> - Clauses (b – d, S, f, g, k) of Article (13) - Clause (a – 1) of Article (14) 	
Instructions for the guiding labels for transporting hazardous or explosive materials No. (2) of 2004	- Directorate of Civil Defense	Hazardous or explosive materials	<ul style="list-style-type: none"> - Apply GHS regarding label, emergency measures, identify the material and its producer or supplier, identify its risks, first aid measures, fire fighting, accidents measures, accidents measures, methods of handling, storage and transport as accustomed in the SDS document. - Control and license narcotics and mental effects. 	- All Articles and annexes No. (1,2)	Effective
Customs Law No. (20) of 1998, as amended.	<ul style="list-style-type: none"> - Ministry of Finance. - Customs Department. 	<ul style="list-style-type: none"> - Industrial products. - Residuals resulting from manufacturing processes provided that they are suitable for re-use as raw materials. - Products taken from sea bed or underground - Damaged, prohibited and 	<ul style="list-style-type: none"> - Identify origin of imported goods. - Identify value of imported goods and customs tariff for locally consumable materials. - Organize goods transport operation including chemicals. - Export and re-export - Organizing the entry and exist of goods and control smuggling. 	<ul style="list-style-type: none"> - Article (24/Chapter 2) - Articles (43, 50, 48, 45) - Articles (58, 57, 56) - Article (34) - Article (35/Chapter 2) 	Effective

		<ul style="list-style-type: none"> seized goods. Goods of restricted import. 	<ul style="list-style-type: none"> Prohibition, restriction and analysis of goods. Destruction of goods not conforming to approved specifications Storage of hazardous and prohibited goods as well as goods banned from entering free zones. Entry for the purpose of manufacturing and export and also for local consumption. 	<ul style="list-style-type: none"> Articles (36-39) Articles (75,73/c) Articles (80, 93, 94, 109, 123, 133, 134, 20, 4, 213) 	
Customs Labs Regulation No. (59) of 1969.	<ul style="list-style-type: none"> Ministry of Finance. Customs Department 	Hazardous Materials Samples	Hazardous Materials analysis	Article (6)	Effective
Natural Resources Organizing Law No. (21) of 1968, as amended	<ul style="list-style-type: none"> Ministry of Energy and Mineral Resources. Natural Resources Authority. 	Explosives used in mining	Protection required for work when using explosives in mines and control its distribution, storage and transportation	Article (47/c)	Effective
Quarries Regulation No. (8) of 1971, as amended	<ul style="list-style-type: none"> Ministry of Energy and Mineral Resources 	Explosives used in mining	Organizing the process of establishing and classifying quarries in all parts of the Kingdom and controlling explosives use	Article (8/b)	Effective
Free Zones Corporation Law No. (32) of 1984, as amended	<ul style="list-style-type: none"> Ministry of Finance. Free Zones Corporation. 	Chemicals entering the free zone.	Permission and control of entry of chemicals provided that the approval of the concerned bodies shall be obtained.	Articles (5,27,22). Articles (37,38).	Effective
Free Zones Investment Law No. (43) of 1987	<ul style="list-style-type: none"> Ministry of Finance. 	<ul style="list-style-type: none"> Rotten or inflammable materials, drugs, explosives and radioactive materials. General conditions for 	<ul style="list-style-type: none"> Prohibition of brining in hazardous goods. Provisions for goods storage. Goods in transit 	Articles (205 13, 5)	Effective

		storage including chemical goods.			
Instructions for storage and investment in free zone and its amendments of 1993	- Free Zones Corporation.	Chemicals entering the free zones.	Organizing entry and storage of chemicals into free zones	- All Articles	Effective
Specifications and Metrology Law No. (22) of 2000	- Institution of Standards and Metrology.	All materials including chemicals.	Identify the role of the institution in terms of status, and control of standard specifications for different products	- Article (5) - Article (14-16) - Article (31)	Fair
Instructions for the system of inspecting imported products based on risk degree No.(4) of 2003	- Institution of Standards and Metrology.	All imported materials, excluding foodstuff, pharmaceutical products, human and veterinary medicines, serum and vaccines.	Control and inspection of imported materials according to degree of risk	All Articles	Fair
Temporary Traffic Law No. (47) of 2001, as amended	- Ministry of Interior. - Public Security . - Licensing Dept. - Traffic Dept.	- Crude oil and its byproducts. - Chemicals.	- Management of transportation means starting from classification, registration, technical test, load, movement or roads, violations, and accidents up to cancellation from the records. - Granting licenses to drivers	Most Articles	Effective
Instructions for transporting hazardous or explosive materials of 2003	- Ministry of Interior - Directorate of Public Security.	Hazardous materials, which are either simple or compound or the refuse of any of them, whether natural or processed that endanger the environment or any of its components and the safety of living creatures due to its toxicity, inflammably,	Prohibit the transport of any hazardous or explosive material on the roads of the Kingdom except under the conditions of the competent authorities.	Article (1-10)	Effective

		explosiveness or corrosion.			
Jordan Valley Development Law No. (19) of 1988, as amended	- Ministry of Water and Irrigation	-	Protection of environment components (Wastes, soil and human from any chemical)	- Article (38/1)	Effective
Transport Law No. (89) of 2003	- Ministry of Transport	Crude oil and its byproducts.	Development of transport sector and protection of environment	- Article (3/c)	Effective
Temporary Law of the Food and Drugs Administration No. (31) of 2003	- FDA.	Foodstuff and medicines	<ul style="list-style-type: none"> - Ensure safety, quality of food and its suitability for human consumption in all its distribution stages. - - Ensure safety, effectiveness and quality of medicine. - - Ensure safety of any other materials provided for in the Law of medicine and pharmacy in force - 	Articles (5/b,c)	Effective
Ports Authority Law No. (36) of 1985 as amended	- Ministry of Transport.	Goods : All commodities, industrial products and raw materials	Construct, manage, develop and use seaports and load and unload ships and provide all services related to seaports.	Article (2) Article (8)	Effective
Regulation for the unloading, storage and clearance of goods at the port of Aqaba No. (25) of 1998	- Ports Authority.	Goods: All commodities, industrial products and raw materials.			Effective
Instructions for unloading, loading and storage of goods No. (25) of 1998 issued in accordance with the Regulation for unloading, storage and clearance of	- Ports Authority.	All goods (solid, liquid and gaseous) imported, exported or stored as packed or unpacked goods in transit, including goods that cause pollution or result in wastes or goods considered as hazardous materials and these are subject to special instructions at the port in terms	Organize the loading, storage, unloading, survey, inspection, and any other matter at the Port of Aqaba.	Article (4) Article (5) Article (6) Article (7) Article (10)	Effective

goods at the port of Aqaba.		of handling or storage in accordance with the roles applied by the International Marine Organization.			
Ships Law No. (51) of 1961, as amended issued in accordance with the abolished Aqaba Port Law	<ul style="list-style-type: none"> - Ministry of Transport - Ports Authority - Public Security - Customs Dept. - Quarantine Directorate 	Cargo of explosive materials such as flammable and explosive materials.	<ul style="list-style-type: none"> - Control of ships bound for Aqaba pursuant to international laws to call upon competent officials to follow the duly practices in this respect if the cargo contains any hazardous materials. - Secure ship's movement when necessary or in emergency cases. - Prevent pollution from hazardous chemicals or oil during loading and unloading. 	Articles (2-5) Articles (7) Article (18/a,b,f,h) Article (21-23) Article (28)	
Ministry of Industry and Trade Law No. (18) of 1998 and its amendments.	<ul style="list-style-type: none"> - Ministry of Industry and Trade 		Draw up and implement general economic, industrial and commercial policies in the Kingdom.	Article (4)	Effective

(4-3) Existing legislations by using tabulation that deal with the various stages of chemicals from production, import up to disposal.

Table (4-2) shows the existing legislations that deal with the various stages of chemicals tabulation showing the type of chemicals and the legislations, which cover these materials as for import, production, storage, transport, marketing and usage, up to disposal to identify points of weakness and the gaps in the legislations for each of these stages.

Table (4-2): An overview of the legislative instruments for managing chemicals by using tabulation.

Chemical Type	Import	Production	Storage	Transport	Distribution & Marketing	Use/ handling	Disposal
Pesticides (Agricultural, Public Health, use and consumption)	X	X	X	X	X	X	X
Fertilizers	X	X	X	X	X	X	X
Industrial Chemicals used in manufacturer	X	X	X	X	X	X	X
Consumed Chemical	X	X	X	X	X	X	X
Chemical Wastes	X	X	X	X	X	X	X
Other Materials (Radioactive Material)	X	X	X	X	X	X	X
Drugs	X	X	X	X	X	X	X

(X) Means that there is a legislation that covers the stage which chemicals pass

(4-4) Brief Description of Legal Approaches, Legal Measures and the Mechanisms Used for Chemicals Control and the Responsibility of the Concerned Bodies:

This chapter deals with the legal and administrative measures adopted by some several governmental departments to explain the applied mechanisms to control chemicals:

First: Customs Department:

- Customs Department has the monitoring and executing role in importing and exporting chemicals that form a large percentage of

the imported and exported materials. This department has a special technical staff at the customs' labs in both Amman and Aqaba, where most of necessary equipment for analysis are provided. These labs test and analyze the chemicals after being transferred to them from different customs' centers. The analysis shows the customs tariff item, the fees percentage, the Ministry of Health Approval conditions on the import-conditioned materials within the statement number (98) for 1996, also the approval of Public Security of explosives, or the materials composing it, and their import conditions. It also shows the role of other parties concerned with chemicals.

- The measures followed by customs department related to clearance of goods through the computerized customs' system (Jarash) passes through four main stages shown in table (4-3):

Table (4-3): Measures followed by the customs department for goods clearance:

Number	Stage Name	Stage Description	Location	Outputs
1	Acceptance of customs manifest	<ul style="list-style-type: none"> - Verification of the completion of the required documents - Verification of the manifest entry into computer. - Verification of the signature of manifest by clearer - Defining manifest track (Red, Green, Yellow) 	Reception Office	Manifest sealed with the track type
2	Documents verification	<ul style="list-style-type: none"> - Verification of data with the enclosed documents classified "yellow/ red" track - subsequent verification of green track data after goods release 	Clearance Units and Inquiries Section	Notice of settlement of fees through the clearers' computer (if he so wishes)
3	Virtual inspection	Red track data consignment survey		
4	Fees collection/ goods release	Collection of fees and due fines, print financial receipt and "exit" pass.	Accounting Department	Financial Receipt and "exit" permit

* Source: Customs' measures computerized project by using the ESKUDA System.

Second: Ministry of Environment:

The Ministry of Environment, established in 2003 to replace the General Corporation for Environment Protection, is considered the entity concerned with the environment protection in the Kingdom. The Temporary Environment Protection Law No. (1) of 2003, Article (6), Article (4/g) and article (23/a), set the basis, instructions and regulations of dealing with harmful and hazardous materials, to collect, classify, storage, remove and damage them, to monitor the institutions to insure their commitment to

standard specifications and approved standards and to abide by them, and also to determine the materials prohibited to enter the Kingdom and to forbid the entrance of hazardous materials into the Kingdom or burry them and send them back to the country of origin, if they were detected.

Table (4-4) shows the most prominent duties that the Ministry of environment performs regarding chemicals.

Table (4-4): The most prominent duties that the Ministry of Environment performs regarding chemicals

Number	Task	The Concerned Entity	Action
1-	Receive complaints	Directorate of Wastes and Hazardous Chemicals.	Conduct field surveys of the hazardous wastes producers
2-	Awareness and guidance	Directorate of Wastes and Hazardous Chemicals.	<ul style="list-style-type: none"> - Hold workshops and seminars - Launch information campaigns - Print and distribute bulletins and brochures - Prepare lectures and work papers
3-	Apply the national and international legislations	<ul style="list-style-type: none"> - Directorate of Wastes and Hazardous Chemicals. - Environment Impact Evaluation Directorate 	<ul style="list-style-type: none"> - Complete instructions and regulations emanating from the Environment Protection Law - Share the world community in applying regional and international agreements.
4-	Training	Directorate of Wastes and Hazardous Chemicals.	<ul style="list-style-type: none"> - Train university students and engineers - Train the directorate cadre

A competent committee was formed under the name "Technical Committee for Managing and Handling Harmful and Hazardous Materials" in accordance with the Regulation for Management, Transport, and Handling of Harmful and Hazardous Materials, No.(24) of 2005 issued in accordance with Temporary Environment Protection Law No.(1) of 2003, headed by the Secretary General of the Ministry of Environment and two specialists members representing the following bodies:

1. Ministry of Environment
2. Ministry of Industry and Trade
3. Ministry of Finance/ General Customs Department
4. Ministry of Water And Irrigation
5. Ministry of Agriculture
6. Ministry of Health
7. General Headquarters of Jordanian Armed Forces
8. General Intelligence Department
9. Public Security Directorate
10. Civil Defense Directorate

11. Royal Scientific Society
12. Jordan Atomic Energy Commission

The committee undertakes the following tasks and forwards its recommendations to the Minister:

- Classifies the harmful, hazardous, restricted and prohibited materials and their wastes.
- Prepares instructions related to specifying the bases, conditions, means and scientific and technical methods to transport, collect, store harmful and hazardous materials and treat their wastes and dispose of them.
- Approves the license forms concerning the handling of hazardous materials and wastes and the validity of each form.
- Approves the forms related to collecting, transporting and storing harmful and hazardous materials.
- Specifies the proper locations for treating harmful and hazardous materials, their wastes, dispose of them and specifies locations for this purpose.
- Any other tasks assigned to it by the Minister and needs a specialized technical study.

Table (4-5) shows the mechanism of handling hazardous wastes at the Ministry of Environment.

Table (4-5) Shows The Mechanism of Handling Hazardous Wastes at the Ministry of Environment.

Stage	Concerned entity	Action	Result
Submit an application for hazardous wastes disposal	<ul style="list-style-type: none"> • Hazardous Wastes and Chemicals Directorate • (Technical Committee for Managing and Handling Harmful and Hazardous Materials) 	<ul style="list-style-type: none"> • Present the application before Technical Committee for Managing and Handling Harmful and Hazardous Materials in order to study them. 	After studying the application, one of the following measures is recommended to deal with wastes: <ol style="list-style-type: none"> 1. The material shall be classified as a raw material for industry available inside the Kingdom 2. Treat this waste. 3. To be classified as a non-hazardous material and shall be disposed of in dump area allocated for household wastes. 4. Store it in the factory until Swuqa project is ready. 5. To remove it to Swuqa project to be buried or stored.
Transport hazardous wastes to Swuqa project	Hazardous Wastes and Chemicals Directorate	<ul style="list-style-type: none"> • wastes preparation (packing, packaging, posters) • Transfer wastes 	Receive wastes at the project location and putting it in the proper place.

		to the project	
Chemicals import		<ul style="list-style-type: none"> Present the application before the specialized committee 	<p>After studying the application, one of the following measures is recommended to deal with wastes:</p> <ol style="list-style-type: none"> 1. If the materials to be imported are not hazardous, its import shall be permitted. 2. If the materials to be imported are hazardous and prohibited, its entry shall be banned. 3. If the materials to be imported are hazardous and conditioned, one of the following measures will be followed: <ul style="list-style-type: none"> - Provide the importer with the conditions. - Address the Ministry, upon the goods arrival to the customs centers to make sure that it is permissible to complete the custom procedures, otherwise it will be rejected.

Third: Ministry of Health

The mechanism currently applied at the Ministry of Health/ Environmental Health Directorate/Chemical Safety Section to complete the applications for importing chemicals controlled by the Ministry of Health, by virtue of the decision of the Minister of Health published in the Official Gazette No. 4717 dated 16/8/2005 shall be as follows:

- 1- The chemical application or the chemicals invoices shall be referred by the customs' centers to the Ministry of Health/ Environment Health Directorate/ Chemical Safety Section, which shall study the application and state whether the imported chemicals are prohibited, conditioned, or non-conditioned according to the decision of the Minister of Health issued in August 2005.
- 2- If the chemicals are prohibited, the Environment Health Directorate shall recommend to the health centers to prevent entry of these chemicals into the Kingdom after recording the material, stamp the application with the directorate's stamp and the custom's center completes the application by rejection.
- 3- If the chemicals are conditioned, the Environment Health Directorate shall obtain an undertaking from the concerned party to open records to follow up distribution of the materials in Jordan, and provide the concerned party with the conditions for dealing with chemicals to provide the concerned party with the conditions for dealing with chemicals so as to provide the concerned authorities. Then, this material shall be registered, stamped with the directorate

stamp and the application shall be completed by rejection or approval.

- 4- If the chemical material is non-conditioned, it shall be registered and the application shall be processed at the customs in approval and stamped by the directorate's stamp.
- 5- If the application or chemicals' invoices are for various chemicals, the import approval will be subject to other bodies such as the Public Security, Ministry of Agriculture, Ministry of Environment and the Food and Drugs Administration, where the application shall be referred to the concerned authority for expressing its point of view in writing, and the application shall be returned to the Environment Health Directorate to be completed and stamped with the directorates' stamp before the customs' clearance.

Figure (4-1) shows an illustration of the mechanism adopted for such measure

Documents and information to be attached to the applications of the Chemicals, received by the Ministry of Health /Environmental Health Directorate

1-An application, submitted by the importing entity with attached to the invoices of chemical to be imported.

2 – To include the CAS No. and the scientific name of every chemical material enlisted in the invoice properly and clearly. Applications with trade names only shall be disregarded.

3- If the chemicals attached are products, an analysis certificate shall be enclosed showing the product's ingredients or MSDS with the complete information, or any other scientific details or other official documents to that effect .

4- If the chemicals listed in the invoice are conditioned by the Ministry of Health, the concerned party shall provide the Ministry with the following, upon submitting the application:

- A letter from the importing company showing the chemicals usage aspects, the using entities, and the quantities sold for each of them.
- A letter from the chemical material user acknowledging receipt of the captioned quantity stated in the importer's letter and scope of use.
- In case the entities buying the materials conditioned upon import are not identified, the concerned party shall provide the Ministry of

Health with a special form undertaking on which revenue stamp of 10 JD is affixed to provide the Environmental Health Directorate with the above-mentioned information data to follow up handling of these materials.

To activate the chemicals chapter, mentioned in the provisions of Law, a committee was formed from the concerned bodies (Ministry of Environment, Civil Defense Directorate, Public Security Directorate, The Jordanian Armed Forces, Food and Drugs Administration, the Royal Scientific Society) to study, revise and update the lists of banned and conditioned chemicals, in force for health reasons. These lists were issued by the decision of his Excellency, the Minister of Health and published in the Official Gazette no, 4717 dated 16/8/2005. Table (4-6) shows a list of banned and restricted chemicals:

Table (4-6) the prohibited and restricted chemicals within PIC lists:

Name of Chemicals	Degree of Restriction	Details of Prohibition
Captafol	Final decision to prohibit import	Prohibited by Pesticides Registration Committee based on the information from PIC since 1995
Chlordan		
Chlordimeform	Final decision to prohibit import	Import and use are banned since 1995 by Ministry of Agriculture
Chlorobenzilate	Final decision to prohibit import	it was banned in 2001
DDT	Final decision to prohibit import	The prohibition decision was published by PIC in 1993, with the exception of its use for fighting Malaria as this continued up to 1995 when it was banned for such purpose by the Minister of Health
EDB (1,2 dibromethane)	Final decision to prohibit import	Its import and circulation was banned in 1995
Dieldrin	Final decision to prohibit import	Its import and circulation was banned in 1993
Dinoseb and Dinoseb salts	Temporary decision to prohibit import	The Secretariat was notified in 1993 on banning its import and that it requires an additional time to reach a final decision in this respect.
Ethylene Dichloride	Final decision to	The decision was taken from

	prohibit import	the Pesticides Registration Committee based on PIC information regarding this pesticide, the decision was registered with PIC in 2001.
Ethylene Oxide	Final decision to prohibit import as pesticide.	Prohibited as a pesticide only. As to other uses, it shall be handled as a restricted item.
Fluoracetamide	Final decision to prohibit import	Its import and use was prohibited by the Ministry of Agriculture in July 1996
HCH(mixed isomers)	Final decision to prohibit import	Its import and use was prohibited in 1993
Heptachlor	Final decision to prohibit import	Its import and use was prohibited in 1995
Hexachlorobenzene	Final decision to prohibit import	Its import and use was banned in 2001
Lindane (α -H-C-H)	Final decision to prohibit import	Its import and use was banned by Ministry of Agriculture in 1982
Mercury Compound	Final decision to prohibit import	The Ministry of Agriculture banned its import and use as a pesticide in 1981
Pentachlorophenol	Final decision to prohibit import	Its import and use was banned in 2001
2,4,5-T	Final decision to prohibit its import as a pesticide	Its import and use was banned in 2001
Toxaphene	Final decision to prohibit import	Its import and use was banned in 2001
Methamidophos	Final decision to prohibit import	Its import and use was banned in 2001
Monocrotophos	Final decision to prohibit import	Its import and use was banned in 2001
Parathion	Final decision to prohibit import	Its import and use was banned in 2001
Polychlorinated Terphenyls (PCT)	Its import and handling in industry was prohibited	It was banned in 2001 under PIC information
Tris (2,3 dibromopropyl) phosphate	A temporary action to permit its import unconditionally	Enlisted within conditioned items at the Ministry of Health in 1996, import requires the Ministry's approval before bringing it into Jordan. There is no information about any of

		its uses and quantities in Jordan
Polychlorinated biphenyls(PCBs)	Final decision to prohibit its import and use in industry	It was banned to be used and handled in 1996
Crocidolite	Final decision to prohibit its import and use in industry	Its import and use in Jordan was banned in 1996
Polychlorinated biphenyls(PBBs)	Temporary decision to be imported under conditions	Enlisted within conditioned items at the Ministry of Health in 1966, and there is no information about its use in Jordan
Actinolite *	A final decision of banning since 16/8/2006	The Ministry of Health decision on the banned and conditioned chemicals was published in the Official Gazette No. (4717) on 16/8/2005
Anthophyllite*	final decision on import banning since 16/8/2005	
Amosite	A final decision of banning import	
Termolite*	Final decision on import banning since 16/8/2006	
Tetra ethyl lead	Permitted to import by JPRC only	
Tetra methyl lead		

Source: Ministry of Health/ Environmental Health Directorate /Pesticides Registration Section

- It is permissible to import the above-mentioned materials for the purposes of brake pads making only for a year from publishing the decision in the Official Gazette
- The measures of addressing the secretariat of Rotterdam Convention on import procedures under implementation by the National Chemicals Authority.

Note: The integrated information system project for Chemicals management, being implemented by the Royal Jordanian Society, involves providing the infrastructure and the equipment required for the electronic linking between the concerned bodies. The first stage is expected to be operated at the end of the 2005, including linking the Custom's centers with the Ministry of Health and the Ministry of Environment, the Ministry of Agriculture and the Ministry of Industry and Trade.

Fourth: Free Zones Corporation:

The Free Zone Corporation shall adopt the following measures when dealing with chemical and hazardous materials upon entering the Free Zones' gates:

- 1-A certificate of origin and a goods manifest shall be required for this type of goods, including its type, quantity and the consignee.
- 2- After verification of the attached documents, information about the goods shall be entered in a special register along with consignee (storage place) at the free zone's warehouses.
- 3- If the information received about the goods is not in conforming to reality, in terms of origin, quality, or extent of its validity, shall be seized in the customs courtyard and coordination with other parties. However, if its validity is not proven, it shall be returned to the country of origin.
- 4-The Free Zone shall sign an agreement with a private qualified company to confine and store the goods at the company's warehouses.
- 5-Upon taking the goods out of the warehouses and Free Zone's courtyard, it shall be referred to the Custom's area for the purpose of defining the customs duties and for clearance.

Fifth: Ministry of Agriculture:

The mechanism, currently applied at the Ministry of Agriculture, to register and import pesticides under the regulations no. g/22, for the year 2003, " Regulations for pesticides' registration, manufacture, processing, import, handling and trading" issued according to the provisions of article 21 of the Temporary Agriculture Law No. 44/2002, is outlined as follows:

- 1- Pesticides shall be registered at the Ministry of Agriculture under the Agriculture Law No. (44) of 2002, article (21) in particular which stipulates that the pesticide must not be prohibited according to PIC list nor included within the prohibited pesticides in Jordan for health or environmental reasons.
- 2- It is not allowed to import pesticides from any entity without having a license authorizing the practice of pesticides import profession.
- 3- The import applicant who has a license to practice pesticides import profession shall apply to the Ministry pursuant to the approved form before getting the import license. This import form shall include the following information:

1. The trade name of the pesticide to be imported, the active material ratio and its concentration.
2. Its registration number at the Ministry of Agriculture.
3. The quantity to be imported by weight and volume.
4. Packing type.
5. The quantity in hand with the importer.
6. Method of shipment
7. Clearance center, the exporting organization name and address.
8. The importer's name and address.
9. The authorized agricultural engineer's name and signature
10. Import profession practice license number.

4- To apply for the import license for pesticides quantity to be imported whether for raw materials for local manufacturing or pre-manufactured to be used in Jordan. This license shall include the following:

- Name of importer whether a person or a factory.
- Active substance in the pesticide.
- Trade name of the pesticide.
- Quantity to be imported.
- Registration number of the pesticide in Jordan and other relevant information.

5- Preparing a delivery permit for the pesticide, attaching an analysis certificate from the country of origin for the original application (the original invoice). This permit shall include the following information:

- The name of the person or the importing factory.
- The trade name of the pesticide.
- The invoice number and date.
- The quantity imported
- The pesticide registration number in Jordan.

6- Specimen of the imported pesticides shall be transferred to Ministry of Agriculture labs by its employees working at the Customs centers for analysis purposes to conform the content and concentration and for making sure that the pesticide specifications are within the world acceptable standards.

7- The imported pesticide can be cleared out against a written commitment with the pesticide value; the imported pesticides shall not be dispose of pending the analysis results, making sure that there is a delivery permit by the Ministry.

8- The imported pesticide containers shall have labels in Arabic, from the country of origin, showing the following information:

- Trade name of the pesticide in Arabic and in English.

- Active material /materials and their concentration.
- The pesticide status (manufacture pattern): liquid, powder.
- Pesticide stability on various water acidity degrees.
- Targeted crops and plant epidemics.

9 In the event the pesticide does not meet the required technical specifications, penalties listed in Ministry of Agriculture Law No. (44) for the year 2002, will be applied.

10- Pesticides are prohibited to enter the Kingdom and they shall be re-exported in the following cases:

-If they were not registered according to the regulations and instructions issued by The Ministry of Agriculture (No pesticide can be imported unless it was registered at the Ministry).

- If they were not registered, and it is found out that they are not allowed to be used in the country of origin or if health or environmental reasons preventing its usage and entrance into Jordan, appeared.

- If they were registered and the test proved that they do not conform the technical criteria.

- If the information written on the labels are contrary to the data and information provided upon registration.

The responsibility of organizing various goods import and export operations in Aqaba area are entrusted to Aqaba Special Economic Zone Authority, including prohibited, banned goods or those subject to a certain entity approval. A proposal was made, for the control mechanism on handling chemicals in the zone, equal in severity to the one adopted at the customs are, figure (4-2). Moreover, preparing the legal instructions, computerized programs and providing the required qualified people to implement this mechanism have started. It is known that, currently, the mechanism applied in the customs' zone, to control chemicals, is adopted as a transitional stage until the Aqaba Special Economic Zone procedures are enforced. This is the mechanism applied for chemicals, in general. But, as for the persistent organic materials, there are no defined legislations or mechanism for import and export operations, especially that several persistent organic materials are forbidden from handling under several decisions issued by various bodies because of its negative impact on the environment and public health.

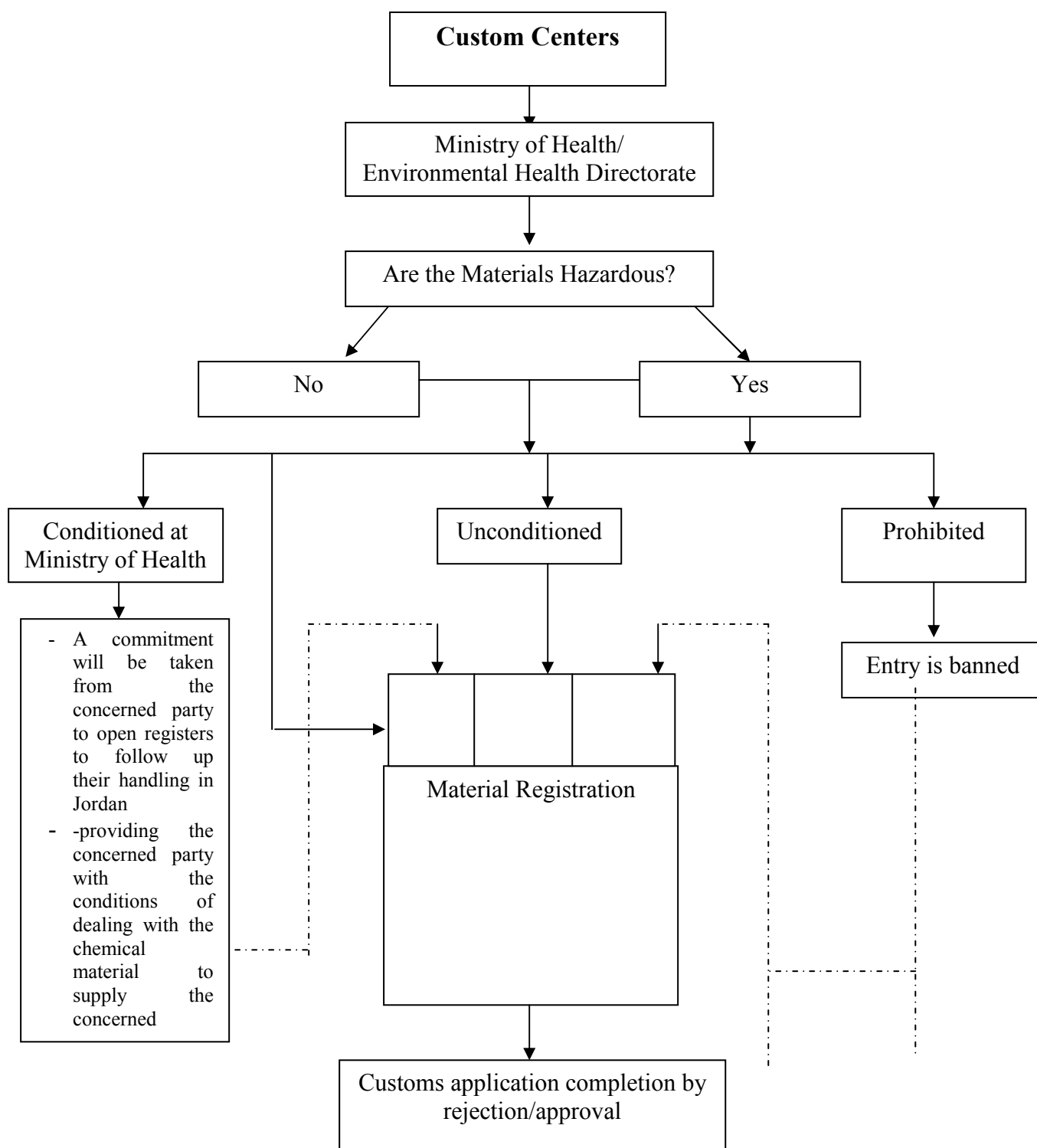


Figure (4-1) diagram showing dealing mechanism with the of chemicals' import applications, currently adopted by the Ministry of Health/Environmental Directorate.

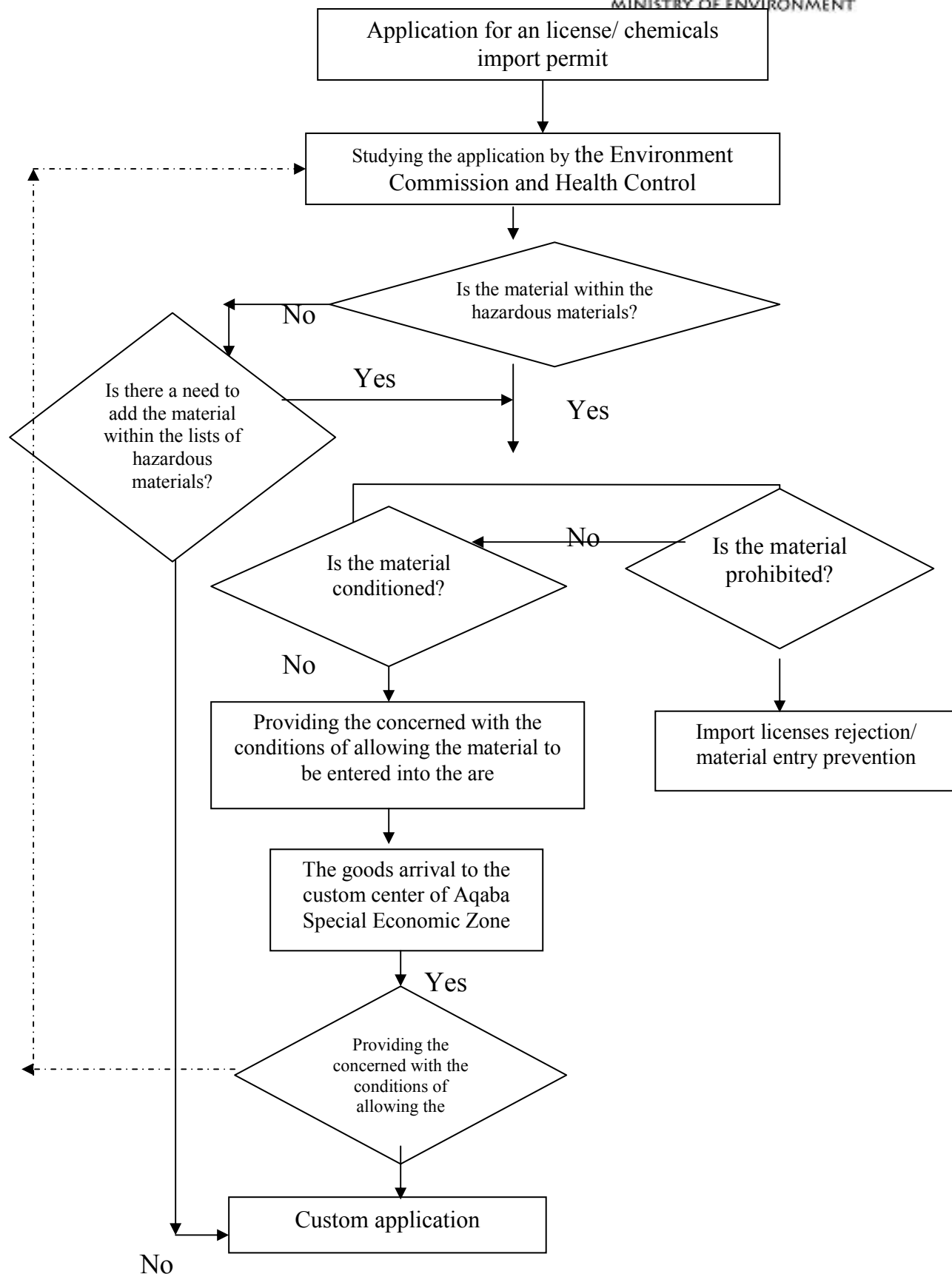


Figure (4-2)) diagram showing mechanism of dealing with chemicals import applications, currently followed at Aqaba Special Economic Zone Authority

(4-5) Non-Organizational Mechanism for Chemicals Management

In Jordan, there is a number of non-governmental voluntary organizations and associations (NGOs) concerned in particular with environmental affairs. These organizations and associations have particular and specific work mechanisms, but they are not connected with specific legislations to deal with and manage chemicals. The Jordanian Environment Society is considered the best example of the working committees in the field of environment protection and chemicals management. The Association projects include the following:

1- Medical Wastes Management Project:

The Jordanian Environment Society implements the medical wastes management project for Greater Amman Municipality under an agreement signed by and between the Society and German Technical Cooperation Agency (GTZ).

2- The Pioneering Project for Sorting Hazardous Household Wastes:

A twin agreement was signed by and between the Hashemite Jordanian government, represented by both Greater Amman Municipality and the Ministry of Environment,, and the American city of Des-Monis, supported by the USAID.

Environmental projects, emanated from this Agreement most important of which are: the pioneering project for sorting out and separating hazardous household wastes and collecting and storing them at environmental safe locations in accordance with the local environmental requirements and conditions until they are treated by scientific methods. This pioneering project was implemented with the cooperation of the Ministry of Environment, Jordanian Environment Society, Greater Amman Municipality, and the Royal Scientific Society during the period from April until mid-September of 2004.

3- Recycling Project:

The Jordanian Environment Society, as the first volunteering society in Jordan since 1994, throughout its awareness programs, implements the recycling project which started individually by the Society through granting motives to the participants in this project. Recycling materials such as paper, cardboard, plastic and minerals became common, currently, for all local society classes taking into consideration that recycling has become an income source for some families and individuals.

4- Comments/ Analysis:

In light of the study and analysis of all the local legislations instruments concerning the chemicals management, it was found out that there are several gaps as follows:

A) Gaps in Legislations:

1. No unified integrated legislative tools handling all the materials and chemical wastes life cycle from import or production instant until final disposal.
2. The deficiency of some current legislation to keep with the developments at the chemicals management sector and their international requirements.
3. Duplication in current legislations, which leads to dispute in specialty among the entities concerned in chemicals management.
4. lack of information to the legislative to show classification of chemicals
5. Multiplicity of words and expressions related to chemicals management definitions.

B) Gaps in Legislations Application:

No application of legislations is attributed to:

- 1) Shortage of qualified cadres to apply legislations of chemicals management.
- 2) Lack of a clear work mechanism for dealing with chemicals.
- 3) The limited financial provisions.
- 4) Shortage of supporting training and awareness programs in this field.
- 5) Weak adherence to apply the public safety conditions, related to chemicals.

Recommendations:

- 1- Making a draft for a unified active legislation for managing chemicals.
- 2- To adopt the classification of chemicals to comply with the world system (GHS).

(4-6) Analysis:

Despite the existence of several legislations related to or having a contact with chemicals, yet these legislations handled chemicals, in general and without limitations. Moreover, these legislations do not cover all the stages of handling chemicals. As for the static organic materials, in spite of the existence of several decisions that prevent dealing with the majority of these items under Stockholm Convention, there is no standard law or system that prevents these materials.

Mostly, prevention is according to decisions issued by several ministries, which circulated these decisions to most departments and concerned organizations. Nevertheless, the process of prevention and control was not covered as required.

The lack of legislations and their activation, as required may be attributed to several matters including:

- (1) Lack of clear mechanisms adopted to follow up these obligations.
- (2) Non-existence of a unified legislation covering chemicals, in general, and non-existence of a persistent organic materials systems.
- (3) Lack of qualified adequate cadres, to perform the tasks assigned to them that have contact and relation to the persistent organic materials.
- (4) Multiplicity of bodies performing control without coordination or conformity among them. This may lead to wasting time and efforts without achieving the intended purpose or objective.
- (5) Lack of information provided to staff on how to deal with the persistent organic materials hazards.
- (6) Non-existence of certain bodies working on the control and execution of public or private legislations concerning materials.
- (7) Abiding to the text without analysis and required flexibility.
- (8) Entrance of pesticides according to a delivery permission only. This process implies several risks. There must be import and export licenses for these pesticides.

Chapter Five

Ministries, Agencies and Institutions Concerned with Chemicals Management

(5-1) Responsibilities and Tasks assumed by the bodies concerned with chemicals management

First: Ministry of Environment

The Ministry of Environment was established in the early 2003, under the Temporary Environment Protection Law no. (1) for 2003, where the Environment Protection Law no. (12) for the year 1995 was cancelled provided that the relevant regulations issued will remain valid till they are revised or cancelled or replaced as described in article 24.

The Temporary Environment Protection Law no.(1) for 2003 includes articles involved in chemicals management at various aspects on handling harmful and dangerous materials as for their classification, storage, destruction, disposal, and the control of various institutions and entities to investigate the extent of their adherence to the standard environmental specifications and the accredited criteria, setting instructions for dumping wastes, determining the extent of their hazards and the treatment method. The act, also, includes articles to penalize and fine violators.

Ministry of Environment Message:

The Ministry of Environment works on maintaining, protecting environment and preserving its elements, to contribute to accomplishing sustainable development by adapting the participative transparent method with the concerned bodies by developing and applying the environmental policies, legislations, effective control on its elements, and the introduction of the environmental concepts within the national development plans.

Ministry of Environment Vision:

It is a typical Ministry on the national and regional level, capable of preserving and sustaining the environment elements and contributing to lifestyle enhancement.

The Directorates of the Ministry:

This Ministry consists of nine directorates plus six directorates at the governorates: Karak, Irbid, Zarqa, Balqa', Mafraq and Deir Alla.

The chemicals management section is affiliated to the directorate of wastes and chemicals management. Figure (5-3) shows the Ministry of Environment work mechanism concerning chemicals management.

Strategic Objectives of the Ministry of Environment:

1. Taking part in Achieving Sustainable Development:

Developing and applying the proper policies, mechanisms and executive tools, which reveal and boost relations between environment conservation and protection and the economical prosperity and contribute to merging the environmental concepts into the national development plans.

2. Policies and Legislations Development:

Developing and executing the effective policies, strategies, and legislations to maintain and conserve the environment.

3. Boosting Control and Inspection and Applying Legislations:

Boosting and developing the mechanisms and programs of control and inspection and applying laws and regulations to minimize the negative impacts on the environment.

4. Information Management Programs Development and Execution:

Developing comprehensive programs for information management with the aim to take proper decisions through collecting, spreading and analyzing environmental information.

5. Increasing Education and Awareness

Spreading the environmental culture, promoting the public awareness in the field of environment conservation and working on inserting the environmental concepts in the various educational methods.

6. National, Regional and International Cooperation Support:

Supporting cooperation with the related national, regional, and international bodies such as local society organizations, academic bodies, mass media, public sector and private sector, keeping communication channels clear and effective to share in achieving the Ministry's message and vision.

7. Boosting and Developing the Ministry Capabilities:

Boosting and developing the Ministry capabilities to enable it perform its missions and execute its message and vision.

Role of the Ministry in Chemicals Management:

The Ministry of Environment performs its role in managing chemicals through a specialized directorate: Directorate of Wastes and Chemicals. Directorates play various technical roles in handling the subject of chemicals according to their work nature.

1- Wastes and Chemicals Directorate:

Directorate Duties:

Developing Policies and Legislations:

- Developing Jordanian legislations and strategies for managing wastes and chemicals.
- Setting and adjusting the national environmental standards concerning wastes and chemicals management.
- Following up the international conventions concerning wastes and chemicals management.

Boosting Control and Inspection and Applying Legislations:

- To monitor the developmental activities that use and/or produce hazardous chemicals and those which produce hazardous wastes in Jordan by developing a national integrated program for control.
- To monitor the performance of solid wastes dumping sites and rectifying their status in coordination with the concerned entities.
- To ensure the efficient application of the legislations and policies pertaining to wastes and chemicals management in Jordan.
- To follow up the execution of wastes and chemicals management programs with the concerned bodies.
- To take part in setting environmental plans, instructions and conditions for setting up developmental projects related to wastes and chemicals management.
- To follow up the citizens' complaints about wastes and chemicals.
- To limit wastes and chemicals types, setting the proper mechanisms for their management.
- To allocate places of priority in the field of wastes and chemicals pollution.
- To set up emergency plan to face emergency conditions which result from hazardous wastes and chemicals.

Information Management Programs, development and Execution

- Developing the means of data and information collection and their analysis methods.

- Working on setting and sustaining an integrated (electronic) national system to manage and control hazardous chemicals and wastes.
- Working on setting and sustaining a database for solid wastes in Jordan.
- Boosting and facilitating the mechanism of exchanging information with the environmental directorates at the governorates.

Increasing the Education and Awareness

- Participating in spreading environmental awareness on wastes and chemicals among various Jordanian society categories.

Supporting National, Regional and International Cooperation:

- Boosting coordination and cooperation with the Ministry's directorates at the center and governorates in a way that contributes to the achievement of the Ministry message and objectives and ensures the sought for integrity in the environment conservation efforts.
- Building institutional relations with the government, semi-government, and non-government bodies in a way that supports the national environmental priorities and achieves the roles integrity.
- Boosting coordination with the private sector in a way that contributes to develop an efficient management of wastes and chemicals and promote using a clean developmental mechanism.
- Building new relationships with universities and scientific research centers, the thing that supports the national environmental priorities and shares in achieving the Ministry message and objectives.
- Servicing the public and the concerned bodies concerning wastes and chemicals management.

Boosting and Developing the Ministry Capacities:

- Building the capacities of the employees of the directorate of wastes and chemicals management, the thing that contributes to achieve the Ministry's message and objectives and the directorate mission.

2- The Directorate of Evaluation of the Environmental Impact:

The Evaluation Directorate of the environmental impact, through its technical committee, revises the studies conducted on the environmental impact evaluation and the central licenses committee reviews and makes decisions concerning the studies and reviews applications licenses for several developmental projects. The directorate has dealt with several studies on chemicals and granted licenses to several chemical factories. These studies include:

- Jordan Bromine Project
- Jordan Magnesia Project
- Organic Hydrogen Peroxide Project
- Petroleum "Coal Usage Study in the Cement Factories.

- Al Hasa Cement Factory Study.
- Liquid Batteries Recycling Project
- The study of utilizing used oils in energy production at Al Rashadiyah Cement Factory.

3- Air Conservation Directorate

Air Conservation Directorate, through implementing studies and control programs, controls air pollutants such as chemical pollutions emitted by the developmental activities, and makes sure of the efficient application of the legislations and policies concerning air conservation in Jordan. The studies and projects, on which the Directorate works, include:

- Monitoring the emitting gases at the hot industrial locations such as cement industry areas, petrol refineries and power production.
- Measuring vehicles exhaust gases at various regions in the Kingdom.
- Weather Change Project.

4- Water Conservation Directorate

Water Conservation Directorate, through implementing control studies and programs, monitors the waters quality in several regions of the Kingdom and makes sure of the efficient application of legislations and policies concerning water conservation in Jordan. The most important projects which the directorate works on are: the National Project of water quality control in Jordan, and works on expanding the project to include the surface, underground, waste and industrial water quality control in all regions.

5- Projects:

The Ministry works on several projects related to chemicals whether local or of an international projects. These projects include:

- The project of constructing and managing hazardous wastes dumping site at Swuqa area.
- The project of persistent organic pollutants under Stockholm Convention.
- The project of replacing the Ozone depletion materials under Vienna Convention and Montreal Protocol.
- Climate change project under the framework Convention of the climate change and Kyoto protocol.

Moreover, the Ministry follows up several international conventions concerning chemicals such as Basel Convention on the Control of Transboundary Movements of hazardous Wastes, Rotterdam Convention and Stockholm Convention for Persistent organic pollutants... etc.

Second: Ministry of Health

There are more than one department at the Ministry of Health that assume the control of chemicals and their various impacts on health or environment, under the Public Health Law no.(54) for the year 2002. The Ministry of Health carries out this work, in coordination and cooperation with various governmental departments (Ministry of Environment, Directorate of Civil Defense, Ministry of Industry and Trade, Industrial Estates Corporation...etc) .

The most Important Directorates controlling the management of chemicals at the Ministry of Health are:

A) Environment Health Directorate:

1. Chemical Safety Section:

Recently, Jordan has witnessed a notable industrial development, which led to the use of new and miscellaneous chemicals. In view of the negative impacts consequent on the circulation of these materials on public health and environment, the Ministry of Health gave remarkable attention to this issue. This attention was obviously evident in the establishment of the Chemicals Information Center, which was mandated to prepare information related to chemicals and their distribution to factories, governmental and nongovernmental institutions, which require the same. This center has been developed later to become a section for chemical safety.

The Section's Functions:

1. Chemicals import control:

This is accomplished by completing the applications received from the customs centers where these items are registered, defined whether they contain restricted or banned materials, provide the concerned with the prerequisites to abide with upon handling these materials and provide the procuring party therewith. Also, this party shall be committed to open a register for these materials wherein it shall record the name of the material imported, quantity and the party to which it is sold to, so that the Ministry of Health can follow-up its handling in Jordan, aiming to do the following:

- Protect public health from the passive impacts resulting from handling chemicals.
- Develop a database to register the conditioned chemicals from the Ministry of Health, imported to Jordan to follow their handling.
- Develop a database to register the produced chemicals where the components and chemical structure of these items are shown, to identify the products that have conditioned or prohibited materials.

2. Control of chemicals factories, import companies and institutions dealing with chemicals to:
 - Ensure that chemicals handling does not negatively affect health.
 - Complete the chemicals information on the national register, within a computerized program for various industrial sectors, which aim to provide the required data on: raw materials used at the developmental sectors, the produced items and the hazardous wastes of various sectors. Moreover, the register will provide the possibility of assigning a national identity number for every factory in Jordan.
3. Participation in setting and revising the legislations, strategies and national projects related to chemicals management to include the health dimension in legislations and national projects concerned with chemicals management.
4. Prepare an initial draft for a national strategy on the chemical safety and work plan to implement this strategy with the assistance of a foreign expert from the World Health Organization.
5. Register the chemical poisoning cases reported by the Health Directorates.
6. Local and external cadres training in the field of chemicals management.
7. The section provides the required information about chemicals found within scientific database to various bodies.
8. Process and follow up the required obligations to implement the 1998 Rotterdam Convention on the Prior Consent Procedure for Certain Hazardous Chemicals Pesticides (PIC) in coordination and cooperation with the parties concerned with the application of the Convention. Based on the mechanism set for such purpose, The Ministry of Health prepares the required responses about the organizational procedures of the strongly restricted chemicals prohibited in Jordan in accordance with the convention items to be sent to the secretariat of Rotterdam Convention. Up to date, all the information sent by the Ministry of Health meets the procedures prescribed in the convention based on the incoming responses to the Ministry from the secretariat in this respect.
9. Setting the national profile for chemical safety in cooperation and coordination with the governmental and non-governmental bodies. The first edition was issued in 2000, revised and updated in 2002. the profile aims to identify and evaluate the current situation of chemicals management and define the entities, which have a direct or indirect relation with these materials management, stating the role of these entities in this process and setting a perspective of the future mechanism in managing chemicals in order to enhance chemical safety in Jordan through building the scientific, technical capacities and updating and modernizing laws regulations related thereto. The national profile was published on UNITAR website. It can be overviewed on:

[Http://www.unitar.org/cwm/national_profiles](http://www.unitar.org/cwm/national_profiles).

10. The environment health directorate was accredited as a subsidiary focal point for health sector information by the National Information Technology Center where information of the entities concerned with chemicals management are collected and coordinated on the website of the focal point to facilitate the information required from all.
11. Setting the stipulations of dealing safely with chemicals in Arabic language to provide the concerned with these terms which include information about the material scientific name, type of risks, the method of exposure, symptoms and means of this exposure, the physical and chemical proprieties, methods of storage, the method of dealing with spillages, leakage and first aid.....etc.
12. Providing scientific information about chemicals. This information includes the materials uses, their health and environmental impact, international studies conducted on them, prevention and care from chemicals hazards available within specialized international databases such as the database of the international chemical safety, the international register of hazardous chemicals, toxicants, abstracts of environmental researches and other scientific information for interested parties, researchers and students.
13. Setting an awareness educational campaign for housewives about the safe dealing with chemicals inside houses. Items of awareness and education were prepared such as posters, leaflets...etc in addition to holding 3 workshops in Amman, Jarash and Karak for this purpose.
14. Holding workshops for the governmental sector and the private sector to introduce mechanisms and programs applied in the Ministry of Health concerning the management of chemicals and the required procedures.
15. Presenting the point of view towards the uses of chemicals in the various aspects.

2. Environmental Control Section:

This section performs the following activities:

- Monitors the type of air, surrounding Amman in terms of suspended dust concentration and total lead PM10 (continuous program)
- Monitors the type of ambient air in terms of concentrations of carbon monoxide, Nitrogen Oxides, Sulfur dioxide, some types of hydro carbonates and heavy minerals, if required, such as: receiving complaints from citizens about certain problems or observing an inevitable hazards to the public health(interrupted programs)
- Controls solid wastes management.
- Controls abattoirs ' wastes.
- Evaluates the health and environmental impact of the new developmental projects for the purposes of health license.

- Conducts the measurements of noise levels concerning their sources, if required.

3. Water Sources, Networks and Sanitary Drainage Control Section

This section assumes the responsibility of water control in the Kingdom to ensure waters safety and its conformity to the set health conditions, the national and international standard specifications to safeguard public health and prevent the environmental pollution, to be in harmony with the requirements of the Temporary Public Health Law no.(54) for the year 2001, which assigned the responsibility of investigating the safety of the water supplied to the citizen in monitoring the Ministry of Health apparatuses. Article (3) of the Public Health Law states that the Ministry of Health is the body responsible for all health affairs in the Kingdom, including the provision of preventive and curative medical services. The section work covers all types of waters supplied:

1) Drinking Water:

Monitoring drinking waters quality to make sure that they meet the health conditions and that the waste waters are not used for drinking purposes or domestic purposes or for food industries, articles (39-42) of Public Health Law. This is accomplished through:

- a) Monitoring water sources to make sure that there is no pollution source threatening them by conducting environmental surveys for sources and samples collection.
- b) Monitoring waters' networks, including treatment plants, pumping stations, water distribution reservoirs and networks to make sure that there is no pollution source menacing the quality of waters there.
- c) Following up the evaluation of waters quality for the consumer from the bacteria-biological, chemical and physical aspects, issuing periodic reports on them by samples collection and testing throughout all stages starting from the source and ending up with the usage point of the consumer to make sure of their compatibility to the approved health conditions.

2) Municipality Sanitary Drainage Waters

- A) Sharing in selecting the treatment plants location.
- B) Monitoring the sanitary drainage plants to make sure that health conditions are satisfied.
- C) Collecting and testing samples of treated water from the sanitary drainage to make sure that they meet the Jordanian standard specification.
- D) Monitoring the quality of agricultural products irrigated by the treated water to make sure that they meet the health conditions.

E) Monitoring health loathsome resulting from sanitary waters drainage.

F) Monitoring the sludge resulting from treatment plants.

3) Surface water: such as waters of dams, streams and agricultural channels.

4) Tankers control: tankers that transport drinking waters and making sure that they meet health conditions.

5) Recreational waters: (swimming pools and (medical) treatment waters.). This is done through:

A) Making sure that health conditions are met at the recreational and tourist locations and facilities.

B) Collecting and testing water samples to make sure that they meet health conditions and standards.

General Function of the Section:

1. Setting and developing control programs for each program and circulating them to the health directorates, including setting the health forms, conditions and instructions.
2. Following up the performance of health directorates concerning work programs
3. Monitoring the general situations in the Kingdom in every aspect of work and issuing the required reports.
4. Setting the required instructions and conditions.
5. Training those who work in the field of monitoring waters whether they are from within or without the Ministry.
6. Contribution in environmental awareness as much as possible.
7. Participation in health inspections on the locations under control by specialists in the section and collecting necessary samples for lab test.
8. Conducting scientific studies, according to capabilities and need.

4- Lab Section:

1. Chemical Tests Lab:

This lab conducts chemical tests for different kinds of water and the environmental and biological samples to determine the chemical pollutants therein. It is the only lab, in the Kingdom affiliated to the Ministry of Health, which performs those tests.

2. Microbes Tests Lab:

A) This lab conducts waters microbes test by analyzing different types of water for microbes (germs) and analyzing waters in the cases of pestilence to detect pollution sources and preserve public health and technical supervision and control of these labs at the various health directorates i.e. 19 labs. It, also, trains the cadres working there, assists in establishing units to analyze waters for germs, when required, and provides them with the required instruments and equipment.

B) Occupational Health Directorate

This directorate is concerned with workers' at various fields and occupations, controls and maintains work environment from occupational hazards and their impact on the workers' health and safety. This Directorate performs its role and missions through the following two sections:

A) Occupational Medicine Section:

This section performs the following:

- 1- Conduct initial, periodic and specialized medical tests...etc. to identify the extent of the worker's adequacy to his job and detects the occupational and non-occupational diseases to any possible level.
- 2- Participate in setting health and technical conditions required for various occupations and industries.
- 3- Show interest, especially in some workers' groups such as:
 - Working women taking into consideration their role in maternity and Giving birth.
 - Handicapped workers and those with special needs.
 - Workers and young trainees.
- 4- Conduct studies and scientific researches in the field of vocational health.
- 5- Participate in training working doctors, nurses health controllers and safety supervisors in the field of society health and occupational health.
- 6- Participate in setting the required recommendations in the field of developing and updating the national legislations of safety and occupational health.
- 7- Give medical consultations for the institutions concerned with occupational health such as the Social Security Corporation and the Higher Medical Committees concerning occupational diseases related to work.

B) Occupational Rectification Section

This section performs the following missions:

- 1- Conducts the initial inspections and follow up inspections on the various producing institutions in the Kingdom.
- 2- Update occupational risks which workers are exposed to.
- 3- Conducts the required environmental measurements at work sites.
- 4- Set proper solutions and measures to minimize the dangers resulting from the productivity process.
- 5- Defines the proper types of personal preventive equipment against vocational hazards.
- 6- Participates in the various technical committees with the ministries and other institutions.
- 7- Participates in developing the various cadres with the ministries and other institutions.

- 8- Health education for workers and individuals in the occupational rectification field..
- 9- Participates in studying the health and environmental impact on industrial projects.

c) Medicinal Control Directorate

This directorate performs the following duties:

- 1. Monitors medicinal and pharmaceuticals especially precursors based on regulations issued by the Directorate and register such materials with the hazardous Drugs Section according to Pharmacy Law No. 43 of 1972.
- 2- License drug and chemicals import stores under article (18) paragraph (B) of the Pharmacy Law.
- 3- Monitors dyes and coloring items received by local drugs and foodstuff factories and the conditions of their approval.
- 4- Monitors chemicals of “cow-origin” particularly if they are of British, Irish, French, Swiss and Portuguese origins according to the recommendations of the Mad-cow committee issued on 19/7/1997.

d) Diet Health Directorate:

- 1- Monitors dyes and coloring items received by local drugs and foodstuff factories and the conditions of their approval.
- 2- Participates in various seminars, workshops and meetings organized by various parties related to chemicals.
- 3- Participates in licensing factories through committees in the Ministry of Health or committee for licensing industrial projects/prevention from industrial risks with memberships of all concerned bodies.
- 4- Monitors the existing and productive industrial projects with negative environment impact, follows up same, evaluates commitment to the public safety rules and conditions from the health and environment aspects in addition to the storage facilities of raw materials and produced materials through field surveys and inspection conducted by different committees.

Third: Ministry of Agriculture:

The Ministry of Agriculture registers and supervises the manufacture and circulation of pesticides, fertilizer and veterinary medicine pursuant to the Agriculture Law No. 20 of 1973, as represented in its four Directorates and the National Center for Agricultural Research and Transfer of Technology.

a) Plant Preservation Directorate:

This directorate includes the two following sections:

-Pesticides registration section.

-Lab section (pesticides analysis lab and residues lab).

This section assumes the following missions:

1. Registers the agricultural pesticides, a committee was formed by the Minister to study the pesticides applications and ascertain its compliance with the international specifications before being permitted to enter Jordan.
2. Participates in the preparation of workshops and symposiums for formulating the basis of pesticides import, setting the registration, control and manufacture of pesticides in cooperation with the concerned parties.
- 3 Verifies the analysis results of pesticides for the purpose of registration, import, and follow.
4. Issues pesticide lists registered in Jordan, relevant technical information and circulation of same to all concerned and Agricultural Directorates.
5. Participates in pesticide related committees including the factories licensing Committee, Industrial hazards conservation committee and pesticides tenders study committees affiliated to the Municipal Affairs Ministry and Greater Amman Municipality.
6. Defines the restricted pesticides and the necessary conditions for their handling.
7. Grant licenses for production lines in the pesticide industries.
8. Follows-up control measures on the stores which sell and handle pesticides..
9. Verifies and follows up the licenses granted to companies and pesticides trading stores.
10. Follows up the collected random samples of pesticides taken from factories, sale and agricultural materials handling to verify its compliance with the Jordanian specifications and standards.
11. Participates in preparing the conditions to be fulfilled for the establishment of pesticide plants.
12. Grants the necessary permits needed for importing raw materials and processed pesticides.
13. Supervises the splitting operations of imported pesticides.
14. Documents all information and quantity of locally produced pesticides.
15. Examines the imported and locally produced pesticides and ensure its compliance with the Jordanian specifications and standards.
16. Follows up of last development of updating of methods of pesticides analysis for completing the registration and control of pesticides.
17. Examines the imported food samples to determine the residual pesticides groups, adopted by the Pesticides Analysis Lab. and ensures the extent of its compliance with the Jordanian standard specification.
18. Examines samples of locally produced crops to determine the residual pesticides and submit recommendations to the competent authorities for taking necessary action.

19. Examines the consignments earmarked for export and ensures its compliance with the specifications in terms of residues effect.

b) Licenses Directorate and Border Centers:

The mission of this directorate is to grant permissions of importing pesticides-fertilizers and Vet. Medicines

c) Land & Irrigation Directorate:

This directorate, through fertilizers section, performs the following:

1. Registers the chemical fertilizers and organic fertilizers, where a committee for agricultural fertilizers registration was formed to study and register fertilizers.
2. Grants delivery permissions for the imported agricultural fertilizers by the private sector.
3. Compares the lab analysis results (chemicals & radioactive) of the agricultural fertilizers with the agricultural fertilizers documents.
4. Follows up and controls the agricultural fertilizers handling and manufacture in the Kingdom.

d) Veterinary Directorate:

The Directorate, through Pharmacy and pharmaceutical control section and the Vet. Lab section / pharmaceutical control lab, performs the following duties:

- 1-The Pharmacy and Drugs Control Section in cooperation with the official concerned bodies and the private sector register and control vet. drugs inside Jordan.
- 2- Grants licenses for factories, warehouses, pharmacies and vet. clinics.
- 3-Grants licenses and delivery permits for importing vaccines and vet drugs.
- 4-Performs continuous control on vet. stores, pharmacies, vet. medicines factories as well as licenses control, medicines validity and compliance with the price list.
- 5- Analyzes vet. medicines and medicament consignments to ensure their conformity with the Jordanian specification.

e) Animal Production Directorate:

The fodder Section represented in the Fodder Analysis lab. analyzes the imported fodder, ensuring its being free of chlorinated hydrocarbon pesticides group and their residual impact of this group according to the Jordanian specification.

f) National Center for Researches and Technology Transfer

The agricultural scientific research in Jordan began since 1951 upon the establishment of the Agricultural Scientific Research Station at Deir Alla and followed by the establishment of similar centers. As a result of development of the agriculture research activities, the agriculture research department was established in 1958 in Amman for the purpose of developing the agriculture sector. Based on the belief of the Ministry of Agriculture in the importance of strengthening the relation between the agriculture scientific research and agriculture guidance, both departments were merged into one department namely “Research and Guidance Directorate in 1969”.

The Agriculture Research and Guidance Directorate exercised its missions effectively and successfully. This prompted the Government to develop the agriculture research work and technology transfer starting so in 1958 to implement the Jordanian National project for Agricultural Development.

In 1993, the national center for agriculture research regulation and technology transfer system was issued pursuant to Article (120) of the Constitution No. (42) under which the objectives and functions of the center as well as its board of directors and appointment of its director general, were defined.

The main National Center is located at Baqa’a., Al-Hussein Agricultural Station. It includes the general management, labs and the technicians buildings. Laboratories are considered one of the main landmarks in this building; these labs include the soil, irrigation water, fertilizer, and plants laboratories, related to the chemicals management. These specialized labs are accredited by the Ministry of Agriculture in the analysis of fertilizer and various soil elements, in addition to the cooperation of the National Center and the Pesticides Section with the importing companies of pesticides for conducting field studies on the extent of some new pesticides, to be registered at the Ministry of Agriculture. The National Center conducts various studies to determine the soil polluted areas and crops as well as conducting studies on water pollution to determine the level of pesticides residues.

Fourth: Ministry of Labor

This Ministry periodically inspects the work places and environment within the framework of the Labor Law No. 8 of 1996, and the regulations, instructions and decisions issued in line therewith. The Ministry accomplishes its missions through the following directorates and sections:

a) Safety and Occupational Health Directorate

The Directorate's cadre consists of 19 physicians and engineers distributed on the labor directorates in the Kingdom. They supervise the application of safety and occupational health stipulations mentioned in the Labor Law through field visits.

This Directorate mission can be outlined as follows:

- 1- Supervision, field inspection, following up the application of safety and occupational health and labor environment specified in Labor Law, regulations, instructions and decisions issued accordingly.
- 2- Proposes regulations, instructions and procedures concerning the application of the Jordanian Law in the field of safety, occupational health and labor environment, following up their development and amendment, as work really requires.
- 3- Participates with the concerned bodies in the issues of safety, occupational health and labor environment committees.
- 4- Cooperates with the related entities in bewaring the workers in the field of safely, occupational health and labor environment and introduces advice and instructions to the production parties in this field.
- 5- Analyses industrial accidents, occupational diseases and their classification, and computes the workers injuries indemnities where the rules of social security do not apply on them.

This directorate consists of two sections: the safety section and the occupational health and industrial accidents section.

The Ministry inspectors are considered members of judicial police. They have the right to write down violations that require financial fine on the institutions violating the law. The directorate cadre performs the inspection on chemicals:

- 1-Storage of raw and produced materials, handling and transferring them among workers.
- 2-The industrial process, machinery utility and availability of safety conditions.
- 3 -Putting a label on each item showing its use and hazards.

- 4- Fire fighting measures.
- 5- Internal work environment to make sure that it is free of chemical hazards.
- 6- The extent of employer's commitment to provide necessary precautions to protect his staff members from the labor environment risks and diseases that may arise, in terms of provision of first aid kit, and conducting periodical checkup.
- 7- Commitment of workers to the use the necessary preventive personal equipment.
- 8- to adhere to the limits of Labor Law provisions in terms of light, noise and weights (in case of lifting) and exposure to the chemical materials.
- 9- Follow up occupational injuries, accidents, and calculation of applicable compensations categories subject to the Labor Law.

Fifth: Ministry of Transport

Ministry of Transport plays an important role in managing chemicals through its interest in transporting chemicals by land and sea. The Ministry signed several agreements organizing and controlling the operations of chemicals transport such as the agreement signed between Jordan, Syria and Lebanon. The Ministry performs its work through the Ports Authority, concerning sea transport and through its various sections in land transport. This is conducted as follows:

a) Ports Authority:

It pays high attention for chemicals, when handled in the field of sea transport for two reasons: the first one is the hazardous nature of such items, and the second reason is the quantity of such items since more than 50% of the goods transported by sea in bulk are chemicals, gases and petroleum products and form 10%-15% of goods loaded in a dry form in containers or small vessels.

This subject of dealing with the hazardous chemicals at the Ports Authority received an adequate attention due to its importance, where the following sections were set-up:

a) Public Safety Section:

This section was established in 1980 to supervise the handling and storage of hazardous chemicals in addition to its other duties in supervising the safety of workers and goods.

b) Health Section

This section undertakes the treatment of all types of injuries including those caused by hazardous materials.

c) Fire Fighting Section

This section undertakes the necessary measures to fight the types of fires including those caused by hazardous materials.

d) Marine Inspection Section

This section undertakes the follow up of measures, which can prevent and control all types of pollution, in coordination with all the concerned parties.

e) Prince Hamza Center for Fighting Pollution

It is equipped with modern equipment for fighting oil pollution.

Ports Authority Missions:

Out of the main missions, which the Ports Authority performs, in the field of chemicals management, are:

1-Applying the approved international safety legislations, in dealing with the hazardous chemicals such as:

-SOLAS 74

-MARPOL 73

2-Applying the relevant national legislations such as:

-Aqaba Special Economic Zone (ASEZ) Law No. (32) of 2000 where the authorities of the Ministry of Environment, under this Law was transferred to ASEZ within the limits of this Authority. Then the Law No. (21) for the year 2001 of environment protection was issued in ASEZ.

-Ships Regulation (51) of 1961, which contributed, at that early time, in preservation of the marine environment in the Gulf of Aqaba area, one of the most sensitive areas. This regulation includes a number of articles on marine environment protection from chemicals.

-Penalizing violators of regulation No.(51) of 1961.

3- Classifying pollutants according to their hazards and formulate the penalties in consistence with the hazards of such pollutants against environment.

4- Field visits to the ships carrying hazardous goods within packages in order to ascertain observance of public safety conditions and the necessary precautions during the transport operation by doing the following:

- Following up storage in terms of storage conditions, observing the separation between items, making sure of packing safety and the non-existence of leakage.

- Conducting field visits to the ships carrying bulk chemicals.

5- Following up with the ship agent with respect to notifying the Ports Authority of any hazardous goods shipped to the port in accordance with an internationally recognized mechanism provided for in the international agreements. There are special forms for conveying this information.

6-Participation in the preparation of initial drafts with IMO Delegations for classifying hazardous materials. This meeting resulted in a document called: The International Maritime System for Hazardous Materials

Sixth: Ministry of Interior

The Ministry of Interior has a main role in managing chemicals through two directorates: Public Security and Civil Defense

a- Public Security Directorate

Public Security is considered one of the effective apparatuses in the field of environment conservation and chemicals control. In this field, Public Security Directorate performs the following:

- 1- Controls the entry of chemicals with explosive properties and the materials of multi-purpose usage. There is a list of ninety-eight items, which needs entry permission by the Public Security. This list is updated when coordination with other security departments is required.
- 2- Controls anesthetic materials and illegal trading with them, captures the promoters of these items and their takers.
- 3- Controls transport movement on highways, escorts the vehicles carrying hazardous chemicals especially the ones that carry materials with explosive nature, from arrival to the Jordanian border until their storage. That will be the case with the exported items of similar characteristics.
- 4- Grants licenses and permissions to import explosives. This also applies to materials export, control their usage, storage and purpose for which it was imported.
- 5- Assists the concerned bodies in managing chemicals by performing the required duties, if needed.
- 6- Participate in the technical committees with the specialized bodies to organize chemicals management and handling and determines the forbidden, the conditioned, the restricted and the controlled items, and update the lists of these items, when required.
- 7- Conducts lab tests on the chemicals to know their nature and rate in blood, especially in the cases of poisoning or death.
- 8- Investigates into the events resulting from chemicals, encircles the event scene and assists other entities related to performing the required duties.
- 9- Conducts a technical test on vehicles to make sure that they meet conditions and technical specifications, especially the ones related to the environment such as the out coming exhausts, casting wastes and making field campaigns at various times and places.

b- Civil Defense Directorate

The most import directorate in- charge of the management of chemicals are:

- Rescue & Support Department.
- Disasters Department and Sections
- Self prevention and protection Department and Sections
- Operations Department and Sections
- Communications Department /Computer Section.

Functions of Civil Defense Directorate in the Field of Chemicals Management:

- 1- Participates in detecting any chemical leakage in cooperation with the concerned parties by dealing with and avoiding its effects.
 - 2- Identifies the preventive measures and self-protection means for the purpose of granting licenses for the manufacture, storage and sale of explosives, fireworks and hazardous chemicals...etc.
 - 3- Studies buildings layouts according to the provisions of building and planning bylaw in force and study of multi-use building layouts, in order to ascertain the availability of self-protection, including chemicals works.
 - 4- Inspects buildings and installations to ensure the efficiency and effectiveness of fire fighting system including the operations that deal with chemicals. In case of violating the provisions of this law, or any regulation or order issued in accordance therewith, the violators will be penalized by a fine, imprisonment, or both.
 - 5-Takes part in supervising the transport of hazardous chemicals on the roads, and formulates instructions about the guiding signs on roads.
 - 6- Controls the distribution of gas cylinders based on Para "a" of articles(4-7) of Law No.(26) of 1985 for organizing and managing the Ministry of Energy & Mineral Resources, published in the Official Gazette issued on 6/8/1998.
 - 7- Prepares and participates in seminars, various workshops and conferences on chemicals management.
 - 8- Participates in the various committees for environmental impact assessment, determines the extent of commitment of the industrial bodies to public safety rules including storage facilities of raw materials and products.
 - 9- Deals with chemical accidents in cooperation with other bodies and provides preventive education and training as well as investigates the causes of accidents.
 - 10- Documents the necessary information on the hazardous installations in the computer with detailed information on installations, workers and chemicals, stored or produced as well as approximate quantities thereof.
 - 11- Submits information to various parties through the Bank of Information, which works round the clock and replies to the inquiries concerning chemicals, medical and industrial guidebook, pesticides directory and hazardous materials transport directory.
- Also, information shall be provided on the emergency measures necessary in case of accidents namely the preventive arrangements.
- 12- Studies and prepares for facing disasters resulting from chemicals.

Seventh: Ministry of Education

The role of The Ministry of Education is represented, in the field of chemicals management, as follows:

- 1- Participates in studying the purchases of the chemicals required for the educational centers, school labs and ascertains the extent of their conformity to the specifications and public safety.
- 2- Provides labs in directorates and schools, with the various chemicals, tools, lab supplies needed for school laboratory work.
- 3- Classifies chemicals, in a scientific method, and places the internationally agreed upon signs to define the type of material, its hazard extent, its storage method or disposal in order to avoid dangerous accidents.
- 4- Prepares lists of chemicals and equipments in each Lab
- 5- Prepares labels comprising the most important information on every chemical substance or equipment and affix them thereon.
- 6- Disposes of wastes and experiments residues, explosives or inflammable items or poisonous materials prepared during the scientific lessons in the correct and sound methods as well as assists schools thereon, if necessary.
- 7- Stores explosives or inflammable materials in labs in the correct and sound manner.
- 8- Provide teachers and students with the suitable conditions and potentials for the use of chemicals and labs. equipment in the learning centers sources and lab. equipment center.
- 9- Maintains security and safety inside the labs. during laboratory activity by ascertaining the availability of safety equipment and dangerous accidents prevention.
- 10-Provides the required technical advice to the people in- charge of school labs to set the specifications of the required chemicals, toxicity level and method of handling.
- 11-Coordinates with the various governmental bodies, particularly the Ministry of Health, Environmental Health Directorate in preparing educational programs for the persons in- charge of the Lab. An effort shall be made for the issue of a guidance directory for dealing with chemicals at school labs.
- 12- Holds training courses and workshops for school labs officers in the field of chemicals management and consumption economy thereof.
- 13- Issues leaflets, guidance signs and instructions related to the rules of work in school labs. method of dealing with the various, equipment, tools and chemicals.
- 14- Confirms the importance of dealing with chemicals in a sound manner and maintain same in the scientific experiments evidences.
- 15- Conducts field inspection tours to school labs to ensure the validity of chemicals, proper storage, disposal of expired chemicals thereof, in the proper way, according to the official instructions.
- 16- Participates in various seminars and workshops related to the management of chemicals.

17- Equips and supplies school labs with the necessary equipment and tools to ensure the safety of teachers and students, such as gas and vapor absorption cabinet, fire extinguishers, first aid kit, etc...

Eighth: Ministry of Industry and Trade

The Ministry of Industry and Trade manages chemicals through the following directorates:

a- Industrial Development Directorate

In this field, this directorate works on the following:

- Monitors the existing productive industrial projects of a negative effect on environment and health, evaluates the compliance with the public safety conditions, from the public health and environment aspects, through the industrial hazard prevention committee in the directorate.
- Participates, with the other concerned bodies, in setting the legislations and instructions related to management of chemicals through specialized committees.
- Takes part in the formulation of Jordanian standard specifications related to chemicals through the technical committees in the Standards & Metrology Institution.
- Participates, with the General Customs Department in formulating the processing formulas related to chemical products.
- Follows up the tires' plants through the committee of tires casing in the Ministry.
- Participates in chemicals and environment safety workshops.

b-Trade Directorate

This directorate issues the import and export instructions concerning the lists of chemicals, which require approval by the relevant governmental institutions.

c-Central Register Directorate

This directorate registers the chemicals producing factories for their production and classifies them according to the industrial sectors.

Ninth: Ministry of Energy

It imports petroleum and its byproducts, through Jordan Petroleum Refinery Company, under the concession agreement granted to the company. The company imports, transports and stores petroleum products according to the needs of the Kingdom. The Ministry of Energy also supervises the electricity generating, conveyance and distribution companies as well as drawing up the national policies related to electrical power. The Ministry performs its missions through the public safety section and the Jordanian Atomic Energy Commission.

a- Public Safety Section

This section is concerned with dealing with emergency cases where it provides the refinery with special machinery and equipment for emergency cases besides fire alarm fire fighting systems as well as storage and production facilities throughout the company's utilities.

b- Jordan Atomic Power Commission

It operates the stations of monitoring Gamma rays in the air, distributed on selected places throughout the Kingdom; it operates automatically around the clock. The Commission carries out periodical activities that include a program for a field radiation survey through:

- 1-Taking samples of soil, air and agricultural products on monthly basis.
- 2- Preparing, developing and coordinating a national plan to face the nuclear and radiation accidents in conjunction with the concerned national establishments.
- 3-Based on the Nuclear and Radiation Power Law No.(29)of 2001, the Commission shall issue the licenses for importing, transporting, storage, handling and use of radioactive materials.
- 4-Following up and handling the radioactive wastes in the Kingdom through instructions issued for that purpose. A part of Swuqa dumping area was assigned for dumping radioactive materials in cooperation with the Ministry of Environment.
5. Provide service in the field of radiation prevention, calibration of equipment and research and commercial gamma radio activation equipment.
- 6-Programmed and non-programmed inspection of national institutions, which use radiation and radioactive items to ensure that they comply with the rules and directives in this respect.
- 7-Coordination with the International Nuclear Energy Agency, and coordinate technical and material support projects for the enhancement of radioactive prevention and peaceful use of nuclear energy with the Arab Nuclear Energy and other international and regional bodies in this field.

Tenth: Jordan Armed Forces

There are several bodies, in the Jordanian Armed Forces that deal with chemicals. Table (5-1): shows the most important chemical industries in the armed forces and the resulting pollutants. In handling, using, transporting, storing and wastes disposal, these bodies rely on the Jordanian laws and international agreements ratified by the Jordanian government in addition to the relevant UN regulations and instructions.

Table (5-1): The most important chemical industries in the Armed Forces

The Industry	The resultant pollutants
Paints	Dusts, volatile organic materials, organic solvents
Printing	Stability solutions
Tissues (blankets & bed sheets)	Dusts, volatile organic materials
Electrical Painting	Heavy minerals, cyanide, bases and acids.
Furniture	Dusts and suspended particles, volatile organic materials
Minerals fusing and formation	Dusts and heavy minerals fumes
Rebuilding Machinery	Heavy minerals, organic solvents, fats, oils (phenol compounds).

The most important chemicals used in the Armed Forces are:

- Organic solvents:
- Acids
- Bases
- Medical and Industrial Gases
- Dyes and coloring materials
- Cotton materials and fabricated threads
- Paints and constructions materials
- Air fresheners
- Boilers' treatment materials, drinking and wastewaters treatment materials
- Waxes
- Furniture and floor polish
- Petroleum products
- Materials used in paints detergents
- Adhesive materials

Eleventh :Ministry of Finance

Ministry of Finance has a role in chemicals management implemented by General Customs Department and its labs.

A- Customs Department

-The Customs Department plays a supervisory and executive role with regard to the import and export of chemicals, as a high rate of the imported materials are produced chemicals and raw materials for chemical industries. Also, a considerable percentage of exports are chemicals such as: potash, phosphates, fertilizers and cement.

- The customs tariff regulation contains three parts and (16) chapters on chemicals, chapters (25 to 40). They include natural, organic and non-organic chemical raw materials, ores, soil, petroleum, plastic, rubber, medicines, pesticides, cosmetics, detergents, soap, candles and adhesive materials.

B-Customs Labs.

The customs Department has a special technical team of experts who work in the customs labs of Amman and Aqaba where almost all necessary equipment for analysis are available. The customs department performs the following functions:

1-The Customs Department labs. Examine and analyze chemicals after being transferred thereto from the various customs centers. The analysis shows the custom tariff item, chargeable fees, showing the condition of the Ministry of Health's approval of the materials whose import is conditioned within circular no. (98) of 1996 and also approval of the Public Security of explosives, or materials used therein and the import conditions under circular no. (98) of 1996.

2-Direct the Inspection Section and clearing companies staff to the safest methods for inspecting chemicals, method of taking samples and guiding them to the proper general safety measures, necessary for dealing with such materials.

Twelfth: Free Zones Corporation

The Free Zones Corporation plays a key role in chemical management, particularly during the entry of such chemicals to the Free Zone, which enter as in transit, re-exported abroad or which enter the Jordanian market.

The Corporation plays this role through:

- 1- Monitoring the entry of hazardous chemicals to the Free Zone, by referring it to the official in-charge (chemical engineer), who shall sort out such hazardous chemical materials and store it in a special warehouse called safe warehouse, which was established especially for storage of hazardous chemicals and was fully equipped. The Corporation has obtained the prior approval of the Civil Defense for using this warehouse after its conformity to specifications, in terms of its design and storage conditions.
- 2- Monitoring the factories that deal with chemicals inside the Free Zone, in terms of their compliance with workers' safety and the environment inside and outside the factory. Factories shall be monitored and controlled through the public safety officer in the Free Zone and the Civil Defense.

- 3- Coordinating with the concerned authorities, Free Zones Corporation and Civil Defense in respect of public safety, in specific if any accident occurs causing fire, in addition to spraying the area with insecticides for fighting mosquitoes annually in coordination with the concerned authorities

Thirteenth: Aqaba Special Economic Zone Authority (ASEZA)

The role of ASEZA is to control the handling of chemicals and hazardous wastes in the zone such as import, transport, storage, processing, export, treatment and disposal thereof. The coordination takes place between the following commissions: Investment and Economic Development, Environment and Health Control and Revenues and Customs in order to strictly control such items through:

1. Controlling imported chemicals through incoming customs' applications into the special zone customs center and obtaining approvals on the chemicals import.
2. Providing the parties dealing with chemicals and hazardous wastes with health and environment conditions, public safety conditions required to permit dealing with such chemicals and hazardous wastes management.
3. Controlling companies, chemicals, and hazardous wastes dealers to ensure their compliance with the health, environment and public safety conditions in the zone.
4. Coordination with the concerned parties in the custom's area for updating and exchanging information on the banned and restricted chemical lists.
5. Following up and assessing the environmental pollution cases, chemical and environmental accidents, and evaluating the various environmental impacts and damages.
6. Exercising the authorities of Ministry of Environment.
7. Participating with the concerned parties in setting necessary legislations and measures to control and improve the management of hazardous chemicals and wastes.
8. Setting the statistical data concerning handling hazardous chemicals and wastes management in the zone.

(5-2) The Role of the concerned bodies in various chemicals management stages

Tables 5-2 to 5-6 show the role of governmental ministries, agencies and various institutions of the different stages for the management of chemicals such as import, production, marketing, use and disposal thereof.

5-2: Responsibilities of ministries and different governmental institutions concerning the handling of chemicals

Stage Concerned Body	Import	Production	Storage	Transport	Distribution Marketing	Use/Handling	Disposal of Chemicals
Ministry of Environment		X	X				X
Ministry of Health	X	X	X	X	X	X	X
Ministry of Agriculture **	X	X	X		X	X	
Ministry of Labor		X	X			X	
Ministry of Industry & Trade	X	X			X	X	X
Ministry of Finance/ Customs Department	X		X				X
Armed Forces	X		X	X		X	X
Ministry of Interior / Civil Defense		X	X	X			X
Ministry of Interior/ Public Security				X		X	X
Ministry of Justice					X		
ASEZA*	X						X
Ports Authority			X	X		X	

Table (5-2) responsibilities of various ministries and governmental institutions concerning drugs handling:

The sign "X" means the body concerned with drugs.

* concerning "ASEZ" only.

** Veterinary drugs

Table (5-3) responsibilities of various Ministries and Governmental institutions for pesticides and fertilizers handling:

Stage Concerned Body	Import	Production	Storage	Transport	Distribution Marketing	Use/Handling	Disposal of Chemicals
Ministry of Environment			X			X	X
Ministry of Health			X			X	
Ministry of Agriculture	X	X	X		X	X	
Ministry of Labor		X	X			X	
Ministry of Industry & Trade	X	X			X		
Ministry of Finance/ Customs Department	X						
Ministry of Interior /Civil Defense		X	X	X			X
Ministry of Justice				X			
Ministry of Foreign Affairs					X		
ASEZA*	X	X	X	X			X
Ports Authority			X	X		X	
Ministry of Interior/Public Security				X		X	X

(X) means the responsibility of the concerned body for pesticides and fertilizers

* Concerning ASEZA only

Table (5-4) responsibilities of various Ministries and Governmental Institutions for handling chemicals used by the consumer:

Stage Concerned Body	Import	Production	Storage	Transport	Distribution Marketing	Use/Handling	Disposal of Chemicals
Ministry of Environment	X	X	X	X		X	X
Ministry of Health	X	X	X	X	X	X	X
Ministry of Agriculture	X	X	X	X	X	X	X
Ministry of Labor		X	X			X	
Ministry of Industry & Trade	X	X			X	X	
Customs Department	X						
Civil Defense		X	X	X			X
Ministry of Justice					X		
Ministry of Foreign Affairs					X		
Ports Authority			X	X		X	
ASEZA*	X	X	X	X	X	X	X
Public Security				X			X

(X) means the responsibility of the institutions for chemicals used by consumers

* Concerning ASEZA only

Table (5-5) Responsibilities of various ministries and governmental institutions for petroleum products:

Stage Body Concerned	Import	Production	Storage	Transport	Distribution Marketing	Use Handling	Disposal Of Chemical
Ministry of Environment			X			X	X
Ministry of Health	X	X	X				
Ministry of Agriculture							
Ministry of Labor		X	X			X	
Ministry of Industry & Trade	X				X		
Ministry of Finance/ Customs	X						
Ministry of Interior/ Civil Defense		X	X	X			
Ministry of Justice					X		
Ministry of Foreign Affairs					X		
Armed Forces	X		X	X		X	X
Ports Authority			X	X		X	
ASEZA*	X		X				X
Public Security				X			
Ministry of Energy	X	X	X	X	X	X	X

(X) means the responsibility of the institutions for petroleum products

* concerning ASEZA only

Table (5-6) responsibilities of various ministries and governmental institutions for handling industrial chemicals:

Stage Body Concerned	Import	Production	Storage	Transport	Distribution Marketing	Use Handling	Disposal Of Chemical
Ministry of Environment	X	X	X	X		X	X
Ministry of Health	X	X	X	X	X	X	X
Ministry of Agriculture							
Ministry of Labor		X	X			X	
Ministry of Industry & Trade	X	X			X	X	
Ministry of Finance /Customs Department	X						
Civil Defense		X	X	X			X
Ministry of Justice					X		
Ministry of Foreign Affairs					X		
Ports Authority			X	X		X	
Public Security ¹	X	X	X	X	X	X	X
ASEZA ²	X	X	X	X			X
Atomic Energy Commission ³	X	X	X	X	X	X	X
Armed Forces ¹	X		X	X		X	X

(X) Means responsibility of the corporation for the industrial chemicals

1- Explosives or materials used in explosive manufacture

2- Concerning ASEZA only

3- Radioactive materials only

(5-3) Analysis

1. There is a lot of overlap and repetition in the work of various parties with respect to chemicals management, multiple terms of references and a great number of laws and regulations enforced by different parties concerning chemicals management.

2. Lack of an integrated national strategy for chemicals management, and consequently there is a difficulty in identifying Jordan priorities concerning management of these materials. This situation leads to a poor coordination and cooperation between the official bodies concerned with chemicals in a clear- cut way. It is to be noted that the Ministry of Health had drawn up an initial strategy in cooperation with WHO expert in 2001. The concerned parties agreed on its broad lines and a recommendation, in due course, was

made for completing the necessary measures in order to formulate the final form of the national strategy.

3-The application of laws and regulations and the imposition of penalties against the violators, depends largely on workers competency and capability, in this field.

Chapter Six

The Role of Non- Government Organizations and Bodies in Chemicals Management

(6-1) Expertise Available Outside the Government Sector

Non- governmental organizations and bodies play various roles in the management of chemicals. These organizations and bodies are either in the form of research centers, universities, national volunteering associations, industrial bodies or associations....etc. It is difficult to mention all these bodies, and to state their roles in chemicals management. Here are some of these authorities and their roles in chemicals management.

1. Royal Scientific Society (R.S.S)

R.S.S is a non-profit organization established in 1970 by virtue of a Royal decree. R.S.S enjoys financial and administrative independence. It conducts works related to scientific and technological research and development connected with the overall development in Jordan, industrial development in particular. The R.S.S aims at the enhancement of scientific and technological awareness in addition to providing distinctive consultations and distinguished technical services. It also seeks to develop the scientific and technical cooperation with similar institutions in the Arab world and worldwide.

693 engineers, researchers, technicians and administrators are employed by the R.S.S. It is located in Amman/ Jubaiha on a 340000 m² plot of land. Buildings and labs area cover 36800 m², including 41 specialized labs equipped with advanced instruments and equipments.

R.S.S. consists of the following technical centers and departments: Building Research Center, Electronic Services and Training Center, Environment Research Center, Design and Mechanical Technology Center, Industrial Chemistry Center, Computer Technology Center, Industrial Studies Center, Administrative Department, Quality Department, and Financial Audit and Communications Department in addition to Princess Sumayah University College for Technology.

Here is an outline of these centers dealing with chemicals:

A) Environment Research Center

The Environment Research Center at the R.S.S carries out and runs applied researches and studies in the required environmental fields. It also offers technical/technological and consultative services for the public and private sectors inside and outside Jordan when required to do so. The vast majority

of services and projects implemented by the center are made through work contracts presented for research and services. The Center also provides specialized training technology services. The main capabilities and competencies are represented in the following:

- Examine/control and evaluate the water quality, all forms of wastewater, sludge, soil and food consisting of fish and poultry as well as the air.
- Evaluation of the environmental impact of industrial projects, evaluate the quality of surface, underground and bottled water in addition to the environment, industrial air as well as the industrial emissions.
- Control and evaluation of household wastewater plants.
- Control of industrial pollution.
- Treatment of solid and liquid wastes.
- Environmental auditing consultations (ISO 14000) and hazardous materials management.

The Environment Research Center has four developed specialized labs:

- 1- Water test lab 1.
- 2- Water test lab 2.
- 3- The Microbiology lab.
- 4- Air quality lab.

In addition to the environmental impact assessment unit.

In 2004, Environment Research Center (R.S.S) began to develop the integrated Jordanian system to control and manage the information related to hazardous materials by introducing a package of software to integrate with the efforts of the governmental institutions in chemicals management. It has a database for the web pages of the security dealing with these materials. It will be the unit main server in the Ministry of Environment; smaller units shall be distributed to other ministries, as required. This system shall be applied in 2006 where specialized units shall be established in the Ministry of Environment, Ministry of Health, Ministry of Agriculture and Ministry of Industry and Trade.

Other institutions shall be added later, as required.

www.hsms.jo

also, In 2004, the cleaner production unit was established to preserve resources, lessen wastes during the production process.
(<http://www.cp.org.jo>)

The training capabilities of the Environment Research Center comprise specialized training in the environment fields of:

Microbe tests in water and wastewater, physical and chemical analysis of water and wastewater, control of air pollution, the applications of atomic absorption of the spectrum, the gaseous chromatographic analysis of environmental samples specimen, assessment of environment impact,

industrial wastewater treatment, environment investigation and environmental management (ISO 14000). (49) employees work for the center including 8 administrators and the remaining (41) are specialized in water, environment engineering, chemical and biological sciences.

B) Industrial Chemistry Center

The Center offers technical consulting services and takes part in developing Jordanian specifications and standards. It carries out physical and chemical analysis through the application of national and international specifications and standards, training, and analysis in food industry and food inputs, medicines, detergents, pesticides, organic solvents, industrial and medical gases, paints, lacquers, mineral oils, chemical fertilizers, salts, minerals and industrial raw materials.

The Center consists of the following sections, labs, and units:

The applied technology section (paints, lacquers, petrol and lubricants unit), inorganic materials section (industrial raw materials unit and spectrum analysis unit), organic materials section (Chromatography unit, organic foods unit, industrial and medical gases unit), paper, leather and tissues section.

C) Computer Technology Center, Industrial Studies and Training

The expertise of the Center in computer technology applications includes the development and programs of information management, development of integrated management system programs in the management of chemicals and other administrative, financial, industrial and environmental informatics, design and develop of data bases, consultancy and studies required for information integration, specialized computer training and computer- related subjects, supply of service sites on the Internet through international information bases, computer maintenance, but it does not limited in these fields only.

This Center employs (106) specialized staff members in computer science, electrical and electronic engineering, economics, business administrations, library sciences and others.

The Center shall be the central authority responsible for developing an integrated information system in chemicals management.

D) Quality Assurance Center

This center provides quality assurance applications for labs. It has an (ISO) quality certificates; national/international accreditation and training on quality systems.

All R.S.S. labs hold (ISO 9000) certificate. (9) labs have so far obtained international recognition while (14) other labs have obtained national

accreditation. The R.S.S. is now working on obtaining the national and international accreditation for all its labs.

These centers can be contacted at the following address: www.rss.gov.jo telephone 962-6-5344701 or fax 962-6-5344806.

2. National Information Technology Center

This center was established as a public official institution, with a legal personality of a financial and administrative independence under Law (81) for the year 2003 "Law of employing Information Technology Resources at the Governmental Institutions". This center became the legal successor of the National Information Center, established in 1993 under the Higher Council for Sciences and Technology, Law no. (50) for the year 1987. A Board of Directors headed by the Minister of Communications and Information Technology assumes management and supervision of the Center. The Cabinet's decision was issued on 2/12/2003 on the assignment of a general director for the center.

This center aims at the following:

- 1- Contribution in applying the national strategy for employing Information Technology (IT) resources in public institutions.
- 2- Building an integral system for information and managing the center on the national level so that it can link the governmental institutions within a national network, through which and in coordination therewith, the most modern comprehensive information and economical, social and technological knowledge will be available. This shall ensure the flow of this information to beneficiaries in the public and private sectors. For this purpose, governmental institutions adhere to cooperation with the center to build this system up.

To achieve this goal, the Center provides the main base of information at the national level and tabulates this information, develops the software concerning the use of an integrated information integrated national system, conducting studies, surveys and researches concerning the governmental institutions requirements and their usage to IT resources, management and registration of the internet bands called (.jo), setting plans and programs to train and habilitate the governmental institution employees on using IT resources, issuance and distribution of publications about developing, using...IT, introducing consultations, implementing plans and programs, presentation, management, operation and maintenance to any of IT resources, when assigned to it or according to an agreement with any concerned governmental institution.

This center was the first to introduce internet into Jordan in 1995. It presented this service to the governmental institutions and the public

universities, executed annual training programs to the concerned in the governmental institutions, which shared in habilitation and development of the technical cadres and creating awareness of the importance of information and how to deal with it. Moreover, the center has a consultative role in public budget allocations and IT purchase orders for the governmental institutions.

This center conducted a set of basic studies and set the policies and national strategies in the field of information and a set of bases, criteria and methodologies related to the required information deemed to be necessary to set up the national information system which connects the governmental institutions in sector sub-networks, through which and in coordination, integrated information on economy, agriculture, industry, health, education...etc are spread out, in a style that facilitates their access by location or by a search means developed for this purpose. The National Information System was released for use in the early 1996.

One of the most important network, is the Jordanian legislations network, through which the Jordanian Constitution text, and texts of all laws, regulations and interpretations, their amendments thereto, legal principles and agreements are spread out.

The “Royal Commission for IT Centers for Technology in Local Societies” commissioned with the center to establish these centers, which reached (100) centers so far aiming to bridge the digital gap between the various categories of the Jordanian society and to pave the way for remote areas to make use of IT and communications so that it may be employed in the social and economical development.

The Center hosts “The Electronic Government Operations Center” to which 6 corporations are connected, in its first phase: Prime Ministry, Ministry of Finance, Ministry of Planning, Ministry of Industry and Trade, Ministry of Communications and IT and Greater Amman Municipality, via a government safe network. This Center shall assume the responsibility of executing many activities related to the Electronic Government and the national initiatives in the field of IT.

Objectives and Missions:

The Center aims to achieve the following:

- Contribution in applying the national strategy to employ IT resources in the governmental corporations and the plans and programs set to implement them.
- Building an integrated information system and managing it at the national level to connect the governmental institutions within a local network through which and in coordination, information,

economical, social and the most modern and comprehensive technological knowledge are made available, insuring the flow of this information to users in the public and private sectors. For this purpose, the governmental corporations adhere to cooperate with the Center to build this system.

To achieve the objectives, the Center assumes the following authorities:

- To provide the main information base at the national level. It develops software related to using an integrated national information system.
- To conduct studies, surveys and researches concerning the requirements of the governmental institution and their usage to IT resources.
- Management and Registration of internet bands in the field known as (.jo), defining the service allowance received by the center pursuant to instructions issued by the council accordingly.
- Setting plans and programs to train and habilitate the governmental institutions' employees on using the IT resources
- Issuance and distribution of publications of information technical resources growth and usage...etc.
- Introducing consultations in the fields of IT resources, software, specifications ... etc.
- Participation in conferences, seminars, scientific meetings, local and external study and social seminars related to the center objectives.

Moreover, the center performs the following:

- Implements the plans and programs assigned according to the specified strategy.
- Provides, manages, operates and maintains IT resources, if assigned, according to the strategy or plans and programs or the agreements with any concerned governmental institutions.
- Issues the technical and operational specifications, if assigned.

Outline of the Center Achievements in the year 2004

First: Studies

- To study capabilities potentials in the field of IT in the public sector corporations. The center conducted this study by collecting information about IT inputs, such as computers and peripherals, their uses and the available infrastructure. This study shall be conducted regularly once a year.
- To study the Jordanian knowledge stations (reality and expectations). The aim of this study is to know the current situation of the

Jordanian knowledge stations by analyzing various aspects of services, activities and effect on individuals, institutions in various local compounds and the extent of their contribution in bridging the digital gap in the field of IT between the regions of the Kingdom and the extent of success achieved through those stations.

Second: Internet Services:

- The services of connection on the Internet: the center updated the instruments and equipment and provided the required manpower to connect the formal institutions and knowledge stations to the internet. There are (237) subscribers, out of which (25) in 2004, the internet service continuity, in the year 2004, was (99,840). In other words, internet service was interrupted for (14) hours only throughout that year. This ratio is very close to the ratio, which the center aspires to achieve i.e. (99,999).
- To host national institutions websites. The center hosts the electronic sites of the institutions wishing to publish information about them and presenting their various activities making use of the instruments and equipment available at the center. Total hosted websites was (51) sites, (9) of them in the year (2004).
- The registration of bands name on the internet. The center, as being in charge of this registration under the name (.jo), registered (2232) names, (361) of them in 2004.

Third: National Information System Network:

The center, in cooperation with the concerned bodies, established information minor networks at the following sectors; economy, labor, industry, agriculture, society and social conditions, scientific and technological, tourism, archeology, housing and housing compounds, health, policy, legislations, education and training, environment, culture, procedures. Efforts are being made to complete and follow up upgrading publications in such networks.

Fourth: Contribution in Developing Information Resources

- Presenting technical consultations to the institutions, when required, according to potentialities.
- Presenting technical consultations in the field of IT before purchase, upon setting the governmental institutions budgets.
- Participation in take over committees, technical studies for tenders belonging to many corporations.
- Design and program some institutions' website.

Fifth: The Jordanian Knowledge Stations:

In effectuation of His Majesty King Abdulla II desire in the construction of IT centers in local communities (knowledge stations), the center erected and equipped (100)stations, (25) of them in 2004 A.D.

Sixth: The Electronic Government Operations Center

The Electronic Government Operations Center was established at the center with the collaboration of the Ministry of Communication and IT, besides the construction of a safe network to connect the governmental. So far, 6 governmental corporations have been connected. The Center provides the necessary facilities to operate this Center.

Seventh: Conferences, Seminars and Workshops

The center organized (6) seminars and workshops related to its activities and participated in several conferences and seminars related to information and information technologies inside and outside Jordan i.e. (25).

Eight: To Upgrade the Center's Potentials :

(17) of the center's personnel attended (21) training courses in the field related to the center activities. The center provided computers, communications, changing the old communication lines that connect the center with the Jordan Tele- Communication Company into optical fibers. System development Section at the center, automated some administrative and financial systems.

3. Jordan Environment Society “JES”

JES was established in 1988 under the law of societies and social organizations. It is registered at the Ministry of Interior.

JES Objectives

- Generate the policies pertaining to environment and application of environmental standards.
- Determine the environmental issues and formulate solutions to them.
- Exchange of information between researchers and attract those interested in the environmental field.
- Promote the environmental awareness for the various sectors of the community to create national and individual interest in the environmental issues.
- Determine the pollution issues and participate in finding solutions to them and enhance the environment awareness amongst the Jordanians.
- Organize and participate in the national and international environmental conferences.
- Print the periodical bulletins related to environment.

- Promote the systems, standards and measures needed for the conservation of the Jordanian environment and control all types of pollution within the framework of the national environment strategy.

The Society prepared a training guide on “The Environmental alternatives for the hazardous household chemicals”. It also works on the pioneering project of segregating the household wastes, which was implemented in cooperation with the Ministry of Environment, the Jordanian Environment Society, Great Municipality of Amman and the Royal Scientific Society between April and mid-July of the year 2004. The project aimed to the following:

- 1- Boosting the public awareness with the household dangerous wastes, their risks, how to deal with them and the methods of treatment.
 - 2- Setting an effective system and method to sort, collect, transport the hazardous household wastes and discarding them.
 - 3- Expanding the project execution base to include all housing regions in Amman and the kingdom, in general.
- HQ address: Amman, Shmeisani, Abdul Hameed Badis St.,
 - Tel: 569-9844, fax: 569-5857, P.O. Box 922821 Amman 11192.
 - E-mail: jes@go.com.jo

4. Friends of Environment Society “FOES”

FOES was established in Jordan in 1995 as an independent non-governmental society concerned with environment issues, particularly educational matters. Its members are Jordanians interested in encouraging and activating the role of the future generation, especially students so as to become an effective element in maintaining and improving environment. It also endeavors to enhance the awareness of the private sector's responsibility towards the preservation of environment.

Objectives of the Society

- Create an environmentally- conscious generation, to enhance the teamwork through the adoption of educational methods that seek to create a spirit of innovation and intellectual development.
- Encourage the private sector to contribute in updating the level of environmental level and activate its role in supporting the projects submitted by students.
- Co-operate with other environment societies to influence the decision-makers for preservation of natural resources in the Kingdom.
- Urging the students on the objective and constructive dialogue in supporting the environment issues at the local, regional and international level.

- Realistic practical application of some projects with environmental and economic feasibility.
- Establish and Publish the Jordanian Network for Industries, the environment friend, relating to the local private sector and link it with international networks aiming to find realistic solutions for the industrial pollution issues.
- HQ Address: Wadi Saqra Street, Wadi Saqra, Commercial Complex, Telephone: 5514430, Fax: 5514431, P.O.Box: 840795, Amman 11184 Jordan
- E-mail: foes@nets.com.jo & foejord@go.com.jo
- Internet web site: www.foe.org.jo

5. Recycling Coalition

This coalition was set-up in 1995 in three societies: The Jordanian Environment Society, the Royal Society for Nature Preservation and Arab Women Society.

Project is Administrative Board includes two members of each society. This Administrative Body was elected on 20 July 2001.

Missions:

- Recycling paper and plastic as well as reduction of pressure on the dumpsites, utilization recycled products, spreading and applying the idea of sorting the solid waste for recycling purposes, urge the citizens to participate in the activities and change the consumption behavior.
 - Disseminating awareness to apply the idea of sorting out the solid waste, especially paper, plastic and aluminum for recycling purposes.
 - Preserve the natural materials from depletion such as water, trees and power.
 - Reduction of the wastes and consequently the pressure on the dumpsites.
 - Urging the citizens to take part in the environment preservation and changing their consumption behavior through circulating of the idea of sorting out the wastes and conveying it to the collection centers for recycling purposes.
 - Supporting local industries through encouraging citizens to use the recycled materials.
-
- HQ Address: Shmaisani Abdul Hamid Badas St.,
 - opposite Arab Potash Co. within the premises of Jordan Environment Society
 - Telephone: 5699844, Fax: 5695857
 - P.O.Box: 840796 Amman 11184 Jordan
 - E-mail: jes@go.com.jo

6. National Society for Environment and Wildlife

It was established in 1996. The society is a none governmental body with a moral, non- profit independent corporate personality but endeavors to preserve the vegetal cover and expanding its area.

An elected administrative body heads the society business.

Objectives of the Society:

- To increase the green areas highlight the nutritional, environmental health and commercial value of the plants species of in Jordan.
- Encourages citizens to maintain an optimal treatment with botanical wealth, use of safe and sustainable methods thereto, and make them aware of the preservation of natural environment and the necessity of collective participation in nature conservation.
- Encourages the preparation of studies and researches related to the natural environment, sponsor the positive opinions and trends in this respect, document results, enhance knowledge of the plants species and place same in available to the public.
- Support of individual capacities as well as investment to the welfare and interest of society.
- Achieves the communication and coordination with the local, Arab and international institutions and societies.
- Achieves the principle of sustainable development in the environment, resources, avoids polluting factors and formulates the necessary plans and programs for preserving it.
- Exchanges Environmental information as far as possible monitors the issues relating to environment and reports it to the superiors.
- Trains media personal, holds workshops, seminars, issues publications and periodical bulletins and attends meetings discussing the environmental issues.

7. National Society for Consumer Conservation

Objectives:

- Study and determine consumer problems, and works. with the official and national bodies and scientific institutions to overcome these problems.
- Develops public awareness by all means for dealing with types of consumer items and commodities as for quality and quantity.
- Enlightens consumers and the public on dealing with consumer commodities and items so as to ensure the individual interest and support the national economy.
- Combats cheating in quality, price manipulation, fighting of high prices, monopoly, guide and enlighten the consumer of the legitimate

ways, and cooperate and coordinate with the competent official governmental organizations.

- Safeguards the consumers interests and represents them to be fore the public and private sectors as well as the official and judicial authorities.
- Forms, fieldwork teams, issues specialized publications magazines, periodical bulletins and using various means of communications to achieve the society objectives and purposes.
- Contacts and cooperates with relevant Arab and international bodies and societies in a manner consistent with the duly laws and regulations.

Address:

Telephone 5153211, Fax 5156983

P.O. Box 926692 Amman 11190

E-mail: consumer@joinnet.com.jo

8) Industrial Estates Corporation

It was founded to plan, build and manage the industrial Estates, encourage the industrial investments, curb the environment pollution through the attraction of industries, in planned and served compounds instead of being scattered here where the developed pieces of land provided with the infrastructure services such as (roads, electricity, communications and sewage.....etc.).

Missions:

- Applies the laws targeting the preservation of an industrial clean environment, free of pollution through its industrial estates.
- to provide units of treating wastewater available inside its Industrial Estates and the re-use of the treated wastewater for restricted agricultural purposes.
- Controls liquid and solid industrial wastes through carrying out the necessary analysis to monitor the quality of wastes generated from plants.
- Coordinates with certain official parties to monitor the plants, which emit some gases, and repugnant odors, which affect the adjacent environment and population.
- Holds seminars for investors in the industrial estates.

9. Amman Chamber of Industry

Amman Chamber of Industry was established in 1991 and provides technical advice to industrialists, through the Environment Department for solving the environment issues including chemicals. It also works on promoting the link between industry and governmental and non-governmental bodies interested in the environment notifying the factories

with rules, instructions and new standard specifications issued by these bodies. Moreover, the Chamber is a member in the Jordanian program for the cleanest production.

Objectives:

- Enhances the environmental awareness amongst industrialists.
 - Trains specialized industrialists.
 - Assists the industry in overcoming its environmental problems.
 - Provides liaison with the concerned governmental authorities.
-
- HQ Address: Jabal Amman, Amman
 - Telephone: 4643001- Fax:4647852, P.O. Box: 1800 Amman 11118
 - E-mail: Aci@aci.org.jo, Website addresses: www.aci.org.jo

10. Professional Associations:

The professional unions play, in general, consultative, educational and informational role. The Unions collect the information relating to the Chemicals Department through the members and working staff.

The professional unions is a group of members specialized in various professional specializations in governmental and non -governmental bodies in line with the nature of specialization. The role of the Unions is confined to holding workshops, scientific symposiums and enlightening of the public such as workers in farms....etc, through bulletins and scientific magazines issued by the professional unions. There is a need for promoting cooperation and coordination level between the government and the unions by exchanging information and participation in the commissions of chemicals management.

11. Government Universities

The government universities in Jordan are considered amongst the bodies which effectively take part in development of scientific methods relevant to chemicals through the foundation and development of scientific labs for serving the students in various scientific colleges such as science, Engineering, Agriculture, Medicine and Pharmacy at the Bachelor Degree level and eventually developing them for the service of the post graduate students. This process would help students use all available chemicals in a proper scientific method, through which one can conduct a scientific research and the sought-after results.

The activities of Universities do not stop at that level, but they succeeded in developing their chemical activities throughout their country. The universities participate in many seminars and government meetings that discuss important researches and studies on air and water pollution.

Amongst the most important studies are: the agricultural development by placing all scientific expertise relating to chemicals in the service of agricultural development.

Here is an outline of some universities and their specialized centers in the field of chemical management and environment management, in general:

a) The University of Jordan

- Water & Environmental Research Study Center.

The objectives of the center in the environment field are:

- Conservation of underground water from pollution.
- Conservation of surface water from pollution.
- Conservation of surface water from depleting.
- Development of human resources and prepare them to work in the water and environmental field.

Means of objectives implementation and types of activities

- Conducts studies and researches.
- Holds local and international training courses.
- Contacts donors to fund these activities.

HQ address: The University of Jordan, Amman

Tel: 5355000 – Fax: 5355560

P.O. Box University of Jordan

E-mail: Water1@ju.edu.jo

Internet website: www.ju.edu.jo

b) Mu'tah University

Field of Interest and Environmental Work

- Safe use of pesticides.
- Development of natural grazing areas.
- Fighting integrated pests.
- Replaces chemical fertilizers with organic fertilizers.
- Reduces pollution of fertilizers.

Objectives of the University in the Field the Environment Conservation

- Conservation of natural resources and biodiversity.
- Organic Plantation.
- Sustainable Plantation.
- Optimum use of water.

Means of Implementation of Objects and types of Activities

- Scientific Research.
- Teaching of students.
- Guidance.
- Participation in conferences and seminars.

HQ Address: Mu'tah University – Karak

Telephone: 03-395151 Fax: 03-395151, P.O.Box 7 Karak

E-mail: Webmaster@mutah.edu.jo

Internet website: www.mutah.edu.jo

c) Yarmouk University

UNESCO center for desert studies and anti desertification, Yarmouk University.

Field of Interest and Environment Work

- Rehabilitation the agricultural soil.
- Water resources exploration and its conservation from pollution.
- Finding out the applied approaches to cut down demand on water resources.
- Combating all forms of desertification.
- Providing the scientific cooperation link between the various specialties and sectors.

Objectives of the Center in Environment Conservation Field

- Water sources conservation from pollution.
- Rehabilitation of soil for agriculture, especially in dry regions.
- Cooperation between the various specializations and bodies in the field of environment conservation.

Methods of Implementation of Objectives and Type of Activities:

- Implementation of Joint studies and researches.
- Intensification of the environment enlightenment.
- Holding seminars, conferences and training symposiums.

HQ address: Faculty of Science, Yarmouk University / Irbid

Telephone: 02-7271100, Fax: 02-7247983

P.O.Box: 21163/566, Yarmouk University

E-mail: i.dweary@usa.net

d) Hashemite University

Institute of Land, Water and Environment/ Hashemite University

- Evaluates the Environmental Impact of the development projects.
- Preserves the underground and surface water.
- Maintains the type of under-ground water.
- Establishes a database related to environment resources.

Methods of Implementation of Objectives and Activities Types:

- Prepares an academic program from the bachelor degree and higher studies level to qualify specialists in the fields of environment conservation.
- Trains specialists from the public and private sectors through the holding of specialized training programs in the field of environment conservation.
- Holds specialized courses and workshops in the field of environment and water sciences.
- Participates in the public and private sectors for solving the environment issues through consultative work with different sectors.

12. Private Universities

In view of the increased interest in university education in the kingdom, there was a need for establishing private universities to standby the government universities, to meet the urgent requirements of university education for the Jordanians and neighboring countries students. Several private universities were established. Some of them play an active role in chemicals management through training, learning and labs. These universities' missions in chemical management may be summarized as follows:

- Provides studies and researches through the labs fully equipped with chemicals and equipment to service students in the realizing their experiments and researches whether for the bachelor degree or postgraduate students, if any.
- Enlightens and disseminates the scientific studies and expertise through scientific magazines it issues and makes them available for interested and competent persons.
- Provides the maximum staff for its labs and research centers. Some private universities became prominent in limited fields and played an important role on the level Jordan. Here are two examples to show some of these fields:

a) Al Zaytoonah Private University of Jordan

- It is specialized in medical herbs, in addition to establishing herbiology research centers.

b) Jarash University

- specialized in studies and researches of interest to farmers and has relations with the development of correct basis for agriculture, particularly in the Jordan Valley region.

Table (6-1) shows a summary of the available expertise outside the government sector.

Table (6-1): summary of the available expertise in the non-governmental sector.

Field of Expertise	Universities ¹	Industrial Sector ²	Professional Unions ³	Labor Unions ³	Environment Bodies	Research Centers
Data Collection	Yes	-	Yes	Yes	Yes	Yes
Testing of Chemicals*	Yes	Yes	-	-	-	Yes
Risk Reduction	-	Yes	Yes	Yes	Yes	Yes
Analysis and Evaluation of Policies in force	-	-	-	-	-	-
Training & Education	Yes	Yes	Yes	Yes	Yes	Yes
Research on Alternatives**	Yes	Yes	Yes	-	-	Yes
Monitoring	Yes	Yes	Yes	Yes	-	-
Compliance	Yes	Yes	-	-	-	-
Information to Workers	Yes	Yes	Yes	Yes	-	-
Information to Public	Yes	Yes	Yes	Yes	-	-
Risk Assessment	-	Yes	-	-	-	Yes

- (1) Related to chemicals management within the university and scientific in it.
- (2) Related to internal management of chemicals within the boundaries of the plant.
- (3) Related to chemicals management through guidance and enlightenment.
- (4) Related to chemicals management through works and projects serving the interest of chemicals management.

* Quality control tests of the raw materials and products.

** Related only to some macro industries.

(6-2) Analysis

- In general, the flow of information concerning chemicals from the governmental bodies to the nongovernmental ones is not so easy. The nongovernmental bodies need official correspondence to obtain a piece of information, which must be specified.
- And that is the case with the nongovernmental bodies, especially those available at the researches and studies centers where this information cannot be channeled without a permission from the research or study financing party.
- Generally, some N.G.Os, especially the universities, the chambers of industry and the private universities take part in decision making through technical specialized commissions such as: The Technical Commission for the Environmental Impact Assessment of the Developmental projects through scooping sessions held to determine the anticipated environmental effects of these projects.
- There are no far-reaching programs in industries to support the chemicals management process. However, work has recently begun on the “clean production project”, which was narrowly applied by few industries. This project may contribute, upon its execution, at a large scale, by the industries as a whole, in the improvement of chemicals management.
- The Environment Societies in Jordan play an important role in the enlightenment and general education process in the field of chemical risks, through workshops and some enlightenment programs, forming pressure factors towards the environment conservation from the risks of pollution including the chemical pollution.
- It is quite essential to upgrade the co-ordination and cooperation between government organizations and NGOs in certain management chemicals fields.

Chapter Seven

Coordination and Cooperation Mechanisms among Ministries

(7-1) Ministerial Commissions and Coordination Mechanisms

Several official concerned bodies handle public safety, health matters and environment. Therefore, many sub-commissions within those bodies, whether ministries or governmental institutions, were formed.

Almost all of sub-corporations actions perform limited goals especially the public safety programs according to the rules of those ministries and institutions.

These also paid attention to chemical safety especially at the business environment (occupational health). In Jordan, many commissions concerned with public safety programs, which usually comprise plans for reducing hazards and risks incurred by the unsafe chemicals usage.

(7-2) Description of Ministerial Commissions and Coordination Mechanisms

Since 1973, the year in which the Civil Defense Law No.7 was issued, Jordan paid attention to chemicals. This act includes the names of (23) chemical items, banned from import, production and sale, except under the responsibility, and supervision of the Public Security Directorate.

Considering the rapid development witnessed by Jordan in all walks of life, the expansion and development in setting up industries and the increased use of chemicals in quantity and quality, more attention was given to the effect of chemicals on health and environment. The government then started to form the first special chemical commission in 1985 to deal with hazardous chemicals. The government began to set regulations and legislation required to license the establishment of chemical industries.

1. Chemical Committee

This commission is directly related to the Ministry of Interior and consists of the following institutions & ministries:

- Ministry of Environment
- Ministry of Labor
- Ministry of Health
- Ministry of Energy and Mineral Resources.

- Civil Defense Directorate.
- The University of Jordan.
- Al-Yarmouk University.
- Ministry of Trade and Industry/ Institution of Standards & Metrology.

The most important achievements of this commission are:

- Setting a safe storage system for handling liquid gas cylinders. This system ensures the structural shape of the warehouse building, public safety requirements, storage conditions, stores equipment, measures to be available in the public warehouses of liquid gas cylinders and the final users compounds, conditions of transport and distribution and installation of the gas cylinders, in addition to the general conditions to be available in the gas storage and handling locations.
- Amendment of Defense Order No.(7) OF 1973-issued under article No.(5) of the Defense Regulation No.(61) of 1939 to the defense order No.(1) of 1987, whereby this order would ensure the banning of import, production or sale of (117) chemical items except under special official permits issued by the Public Security Directorate and under its supervision. The items covered were reduced to (78) items instead of (117).

(2)Pesticides Registration Committee (PRC):

- Pesticides Registration is conducted by a commission formed by the minister under article (14) of pesticides registration, classification and import regulation issued under article (21) of the interim agriculture act no.44 for the year 2002.
- The Pesticides Registration Commission is formed under the presidency of the Plant Conservation Directorate head and the membership of:
 - 1-Ministry of Health representative-named by the minister of health.
 - 2- R.S.S. representative-named by the society head.
 - 3- Jordan governmental universities representative /college of Agriculture- named by the university head, required to share in the commission work.
 - 4- Ministry of Environment representative-named by the Minister of Environment.
 - 5- Two representatives for traders and the agricultural materials producers, one for two factories.
 - 6- National Center for Research and Technology Transfer representative-named by the Center General Manager.
 - 7 - Agricultural Engineers Association representative.
 - 8- The Dept. head of Conservation labs/Ministry of Agriculture.

Pesticides Section head shall be in charge of this commission work.

3-Agricultural Fertilizers Registration Committee

It was formed under the Ministry of Agriculture Law No.(44) of 2002, article (20). The mandate of the commission covers the selection and determination of the types of agricultural fertilizers, fixing their prices, specifications, registration measures in addition to the conditions and methods of executing this item.

Members:

- Ministry of Agriculture.
- The University of Jordan.
- The National Center for Research and Technology Transfer.
- Private Sector (Fertilizers Importing Companies).

4- Technical Committee for Veterinary Medicines Registration

A technical commission formed under article (5) of vet. drugs industry No (Z/33) for the year 2003, under article (45) of the interim agriculture act No 44 for the year 2002.

The technical commission consists of the chairman and the membership of the following:

- 1- The pharmacy and pharmaceutical control section head at the directorate.
- 2- Vet. Lab Section head
- 3- A representative of Vet. Doctors Association.
- 4- A representative of Pharmacy Association.
- 5- A representative of the Ministry of Health, a pharmacist from the drugs directorate.
- 6- A representative of Ministry of Industry and Trade.
- 7- A veterenian, drugstore owner.
- 8- A veterenian, a representative of drugstores or bio-products.

The committee convenes periodically, monthly, and (12-14) applications for registration are presented every session, in addition to the companies' registration applications.

5) Pharmaceuticals and Medicines Registration Committee

It was set up under Pharmacy Profession Practice Law No. (80) of 2001. Its mission is to grant licenses for medicines and ready-made pharmaceuticals, baby food circulated in Jordan, or would-be imported or locally produced in accordance with instructions and legal articles set for this purpose.

6) Food Additives Registration Committee

Food additives shall be registered at the Jordan Institute for Standards and Metrology according to special technical specifications formulated by a commission called Food Additives Commission. This commission is formed at the Ministry of Health/Food Monitoring Directorate whose mandate is to study food additives, formulate technical specification for its use, study any new developments or information pursuant to International Recommendations, such as FAO, WHO and the like. The commission studies such information and publicizes it to all official bodies.

The Commission membership includes representatives of the following bodies:

- Ministry of Health /Food Health Directorate and Environmental Health Directorate.
- Ministry of Agriculture.
- Jordan Institution for Standards and Metrology
- University of Jordan/Faculty of Agriculture.
- Jordanian Science &Technology University/Faculty of Agriculture.
- Amman Industrial Chamber.

7) Industrial Hazardous Prevention Committee

Sponsor: Ministry of Industry & Trade. The Commission tasks :

- To create a reference and a specific form for inspecting industrial installations
- Formulates criteria to identify the projects of most negative environmental impact, and the installations of high-risk level on the health and public safety.
- Determines the list of industrial corporations to be inspected.
- Conducts factories field inspection to ensure their compliance with the laws and instructions of environment, health and public safety as well as the extent of their conformity with the conditions of factories' establishment.
- Prepares inspection reports; addresses the factories management for the implementing the recommendations mentioned there and time frame needed to rectify the situation of them.
- The Committee shall inspect the factory after the expiry of the timeframe granted thereto in order to ensure the implementation of the recommendations, and in the event of repeated violations, the commission shall recommend necessary measures to be conducted by the authorized bodies.

The Most important results achieved by the committee are:

- Reduction, to some extent, the number of factory inspections.
- Reduction of recommendations multiplicity.

-Achieving a quick response by the factories administrations in implementing recommendations listed in the commission report.

The committee includes the membership of the representatives of the following bodies:

- Ministry Of Industry and Trade
- Ministry Of Health, Environment Health Directorate, Professional Health Directorate.
- Ministry Of Environment
- Ministry Of Labor
- Ministry of Planning
- Ministry of Water and Irrigation /Water Authority
- Ministry Of Agriculture
- Institution of Standards and Metrology
- Directorate of Civil Defense
- Industrial Estates Corporation
- Municipality of Great Amman
- Chamber of Industry (Amman, Al Zarka, Irbid).

The Committee shall conduct factory field inspections once a week and shall hold every other week meeting.

8) The National Committee for the Non-Proliferation of Chemical Weapons Convention

Jordan has signed the non-proliferation of chemical weapons convention due to its importance in securing a health environment suitable for human life. It also aims at preserving the various natural elements such as air, water and soil. Jordan has delivered the ratification documents to the U.N Secretary General on 29/10/1997 and has become effective in Jordan on 28/11/1997 AD.

A national committee was formed on 29/1/1998 to apply and follow-up the said clauses of the convention under the chairmanship of the General Command of the Jordanian Armed Forces. The file of this Commission was transferred to the Ministry of Interior.

The participants:

- The General Command of Armed Forces.
- Ministry of Foreign Affairs.
- Ministry of Industry & Trade.
- Ministry of Health.
- Ministry of Higher Education.
- Ministry of Agriculture.
- Directorate of Public Security.
- General Directorate of Civil Defense.

- Free Zones Corporation.
- General Customs Department.
- The Royal Scientific Society.
- The University of Jordan.
- Amman Chamber of Industry
- Ports Authority.
- Clearing Companies Owners Association.

Committee Tasks:

- Contacts and coordinates with the Non-Proliferation of Chemical Weapons Organization in relations to the provisions convention implementation.
- Ascertains the compliance of all governmental military and civil parties, each with the sphere of his competency, to the convention provisions, formulates all instructions, follow-up control measures on incoming and outgoing chemicals to and fro the Kingdom, production, transport, storage and trading procedures in accordance with the convention provisions and continued follow-up of all technical aspects. The office of the National Commission head is considered the main contact with the organization.

9) The National Committee for Chemicals Management

This committee was formed pursuant to the Prime Ministry's letter No. 10/13/11111 on 13/11/1996, with the participation of the concerned parties in chemicals management, including:

- Ministry of Environment.
- Ministry of Water & Irrigation.
- Ministry of Health.
- Ministry of Agriculture.
- Ports Authority.
- Institution of Specifications & Metrology.
- Ministry of Industry & Trade
- The University of Jordan.
- Al-Yarmouk University
- The University of Science & Technology.

The committee held a chain of meetings, all the year round, during which it drew-up the system No.43 of 1999: the Management and Handling of Harmful and Hazardous Materials Regulation No. 43 of 1999. The Technical Committee for Management and Circulation of Harmful and hazardous materials, in the Kingdom, was formed under the chairmanship of the Director General of the Ministry of Environment, and the membership of two specialized members for the concerned parties.

10) Technical Committee for the Management & Handling of Harmful and Hazardous Materials.

Sponsor: The Ministry of Environment. This commission has the membership of the representatives of the following bodies:

- Ministry of Environment.
- Ministry of Health.
- Ministry of Agriculture.
- Ministry of Industry & Trade.
- Ministry of Water Irrigation.
- Ministry of Finance/Customs Department.
- General Headquarters of the Armed Forces.
- Public Security Directorate.
- Civil Defense Directorate.
- The Royal Scientific Society
- General Intelligence Department.

The Committee recommends the following:

- Classifying the harmful, hazardous/banned and restricted materials and wastes of.
- Setting the bases, rules, scientific and technical methods and means necessary for transporting, collecting and storing the harmful and hazardous materials and disposing their wastes according to instructions issued for this purpose.
- Approving the forms related to the collection, transport and storage of the harmful and hazardous materials.
- Locating the suitable sites for disposing the harmful and hazardous materials and their wastes as well assigning plots of land in these sites for this purpose.
- Recommending to issue the required regulations and instructions necessary for the implementation of the of harmful and hazardous materials management regulations provisions.

Achievements of this Committee

- Participation of the bodies concerned in chemicals management in setting the legislations and legal tools needed in this field, including:
 - Hazardous waste treatment fees regulations.
 - Hazardous wastes handling regulation (generation, storage, transportation, treatment and final disposal)
 - Used oils handling regulations.

-Preparation of the Terms of Reference (TORs) document for the Hazardous Waste Processing Center, which will take effect on 1st June 2002.

11) Central Licenses Committee:

It was formed by virtue of H.H. Prime Minister's letter No.23/11/1/994 dated 3rd of January 1998.

The committee membership includes the representatives for the following bodies:

- Ministry of Environment.
- Ministry of Municipal Affairs.
- Ministry of Water and Irrigation.
- Ministry of Health.
- Ministry of Agriculture.
- Natural Resources Authority.

Committee tasks:

Recommending the approval or refusal of erecting various developmental projects outside the organization borders. Pesticides factories were included in the commission work under a letter of His Highness, the prime Minister, no.9/13/3956 on 2/4/2002 provided that the Ministry of Labor representative and a Civil Defense Directorate representative shall be added to its membership.

12) Quadruple Technical Committee

This commission was formed under the presidency of Ministry of Labor and the membership of the representatives of the following:

- Ministry of Health /Directorate of Occupational Health Institute.
- Public Corporation of Social Security.

The Committee Tasks:

- Follow up to what extent safety and occupational health conditions are applied.
- Take the necessary procedures as stipulated in the Labor Law and public health Law.

13) New Industrial Projects Study and Assessment Committee:

It is an internal commission at the Ministry of Health represented by the following directorates:

- Environment Health Directorate.
- Food Monitoring Directorate.
- Medical Institution Professions Directorate.
- Medicines Directorate.
- Occupational Health Directorate.

Committee Tasks:

- Recommends the approval or refusal of establishing an industrial project inside the zoning areas based on the assessment of the project's health and environmental impact.
 - Provides the concerned party with the health and environmental conditions to be implemented and assessed the extent of its compliance.
 - Recommends granting the health license (vocations and Industries license).
- This committee is held weekly.

14) The Committee of Persistent Organic Pollutants Project:

This commission was formed at the Ministry of Environment to follow up the execution of persistent organic pollutants project based on Stockholm Convention where there is a commission for managing the project and an orientation commission for the project.

• The Project Management Committee

It includes the membership of the following:

- The Ministry of Environment General Director.
- The Project Coordinator
- Ministry of Environment representative.
- Ministry of Planning representative.

●The Project Steering Committee:

It includes in the membership, the representatives of the following bodies:

- Ministry of Environment
- Ministry of Planning
- Ministry of Agriculture
- Ministry of Health.
- Ministry of Industry and Trade
- Customs

- Armed Forces
- Civil Defense
- Royal Scientific Committee
- Jordanian Environmental Society
- Amman Chamber of Industry.
- Amman Chamber of Commerce

The Committee performs the following tasks:

- Acts as a consultative committee for the project.
- To motivate the cooperation and coordination among various projects through information exchange.
- Makes sure of the project integrity with the national plans guidelines and policies.
- Assists in the campaigns supporting the project.
- Participates in workshops and conferences.
- Reviews and approves the project national plan.

15- Other Committees

There are sub-committees formed in different institution and ministries according to the need and when necessary and the concerned parties often take part as members therein. For example, committee mandated to dispose of some chemicals and other committee, which study new food additives or medicines.

There are also committee, formed in the Institute for Standards and Metrology to which the concerned parties are invited to issue a specification to specific chemicals or an imported or processed products.

The work of such committee ends upon the formulation of the specifications draft and its submission to the Institute of specifications and Metrology for study and approval.

Also, there is a joint committee from the security authorities to grant and follow the transport and handling or storage of explosives substance licenses. There is a committee for destroying anesthetics. This committee is formed under the recommendation of the General attorney of the state security court to the Minister of Justice, who in turn, decides the committee formation. The legal reference is the act of anesthetics and mental effectors No. (11) for the year 1988.

(7-3) Description of Mechanisms of obtaining Information from the Non- Governmental bodies:

The non-governmental bodies take part in many technical committee and some executive councils related to chemicals management such as participation in the discussions for assessing the environmental impact of developmental projects and in the technical Committee for the management and handling of harmful and hazardous materials.

The most important bodies include:

- The Royal Scientific Society
- The National Information Center for technology.
- Public and Private Universities in Jordan.
- NGOs such as Jordan Environment Society and Environment Friends Society.

(7-4) Analysis

- Most technical committees concerned in chemical management at their various handling stages represent all the related bodies whether they are governmental or Non-governmental. Some bodies or individuals, as required, are asked to implement limited missions.
- The mechanisms available through the committee do not cover all stages of chemicals handling as possible.
- In general, the technical committee lack a mechanism for exchanging the chemicals information among them as most of them work independently.

Table (7-1) shows the summer for the Outline Of The Ministerial Committees And The Mechanism Of Coordination Among Them

Table (7-1): Outline Of The Ministerial Committees And The Mechanism Of Coordination Among Them

No.	Name Of Mechanism/ Committee	Responsibilities	Secretariat	Members/Bodies	Legalizations	Effectiveness*
1.	Technical Committee for the management, transportation and handling of harmful and hazardous materials	<ul style="list-style-type: none"> -Classifies harmful, hazardous, restricted and prohibited materials And their wastes. -Prepares instructions to specify the bases, conditions, means, scientific and technical methods to transport harmful and hazardous materials, collects, Stores, Treats Their Wastes And Disposal. -Approves the license forms concerning hazardous materials and wastes, showing validity period for each.. -Approves forms related to collecting, transporting and storing of hazardous wastes. -Specifies the proper locations for treating harmful and hazardous materials and their wastes disposal and specifies plots of land in these locations For This Purpose. -Any other tasks referred to it by the minister and needs specialized technical study. 	Ministry of Environment	Ministry of Environment, Ministry of Agriculture, Ministry of Health, Ministry of Industry and Trade, Ministry of Water and Irrigation, Customs Department, General Headquarters of the Jordan Armed Forces, Ministry of Interior (Public Security and Civil Defense), General Intelligence Department, Royal Scientific Society	Regulation for management, transport and handling harmful and hazardous materials No. 24 of The Year 2005	2
2.	Agricultural Fertilizers Registration Committee	Agricultural Fertilizers Registration	Ministry Of Agriculture	Ministry of Agriculture, University of Jordan, National Center For Research and Technology Transfer, Fertilizers Import Companies	Article (20) Of The Temporary Agriculture Law No. 44 For The Year 2002	2

3.	Quadruple Technical Committee	Follow up compliance of the Different Production Institutions, including the chemical producing sector, with professional safety and health requirements.	Ministry of Labor	Ministry of Labor, Ministry of Health, Social Security Corporation, Vocational Corporation Safety and Occupational Health Institute	Labor Law, Health Law, Social Security Law	1
4.	Industrial Hazards Prevention Committee	To review status of Jordanian industries, and determine locations thereof in light of the possible hazards resulting from their raw materials, products and residues and work conditions therein.	Ministry of Industry and Trade	Ministry of Industry and Trade, Ministry of Health, Ministry of Labor, Ministry of Planning, Ministry of Water and Irrigation, Ministry of Environment, Institution of Standards and Metrology, Civil Defense Directorate, Industrial Estates Corporation, Greater Amman Municipality, Chambers of Industry	Laws of All bodies members of the Committee	2
5.	Industrial Hazards Prevention Committee Aqaba	Inspection of all Aqaba Institutions		Civil Defense, Health Directorate, Aqaba Governorate, Labor Directorate, Aqaba Special Economic Zone (ASEZ)	ASEZ Law, Public Health Law, Labor Law, Civil Defense Law, Higher Committee for Public Safety.	2
6.	Pesticides Registration Committee	Registers Imported and Locally manufactured pesticides	Ministry of Agriculture	Ministry of Agriculture, Ministry of Health, Ministry of Environment, National Center For Agriculture Research, Agriculture Materials Merchants Association, Agronomist Association, Royal Scientific Society, Agricultural Pesticides and Vet. Drugs Factories.	Article (21) of The Temporary Agriculture Law No. 44 for The Year 2002	1
7.	Food Management Council	-Sets the general policies for health control of food in the Kingdom and follow up implementation thereof. -Sets the plans and programs for food safety control.	Food & Drugs Administration	Disease Control Directorate of the Ministry of Health, Health Environment Director in the Ministry of Health, Food Labs. in the Ministry, Ministry of Agriculture, Ministry of Trade &	Temporary Food Control Law No. (79) of 2001	2

		<ul style="list-style-type: none"> -Adopts technical rules and health measures. -Approves the required instructions and conditions for food control. - Identify health conditions as prerequisite for licensing food distribution places. -Adopts hazards assessment measures. -Adopts necessary measures and requirements for using food Additive. -Accepts the technical rules, evidences, or recommendations from the documents issued by other countries and Arab, regional and international organizations for approval where appropriate. 		<p>Industry, Ministry of Environment, of Customs Department Institution of Standards and Metrology, Greater Amman Municipality and seven specialists representing :</p> <p>One Jordanian university, Veterinarians Association, Agricultural Engineers Association, Chamber of Industry, Federation of Chambers of Commerce, Foodstuffs Merchants Association, and Consumer Protection Association</p>		
8	Technical Committee for Registering drugs having an identical registered in the Kingdom		Food & Drugs Administration	Supply director at the Ministry of Health, Assistant director for Labs Affairs, Head of Drugs Registration Department at the Directorate, Pharmacist, specialist in Drug movement, specialist in pharmaceuticals	Drugs & pharmacy Law of 2001	2
9.	Pharmaceuticals and Drugs Registration Committee	Licensing drugs, readymade pharmaceutical products and processed and imported children food	Ministry of Health	Drugs registration head at the directorate, import and export section head at the directorate, two medical doctors, one internal medicine specialist and a pharmacist specialist in drugs movement or in clinical pharmacy	Drugs and Pharmacy Law No. 80 for The Year 2001	2

10.	The Higher Committee for Food Control	<ul style="list-style-type: none"> -Proposes necessary plans and programs required to control food quality and safety, and forwards them to the Administration board of directors for Approval. - Suggests the instructions and the conditions required for the health control to the local and imported food, and ensures its safety and suitability for human consumption, and making sure of its nutrient value -Identifies health conditions required for licensing food places according to the legislations in force. - Adopts the measures of hazards evaluations - Adopts types of food tests. - Adopts measures and requirements for using food additives - Selects labs required for food tests and lab analysis - 	Food & Drugs Administration	Ministry of Health, Food Lab Section at the FDA. Ministry of Industry and Trade. Customs Department, Department Institution of Standards and Metrology, Greater Amman Municipality and seven specialists representing : One Jordanian university, Veterinarians Association, Agricultural Engineers Association, Chamber of Industry, Federation of Chambers of Commerce, Foodstuffs Merchants Association, and Consumer Protection Association	Temporary food Control Law No. 79 for the year 2006	2
11.	National Committee For The Chemical Weapons Non-Proliferation Treaty	<ul style="list-style-type: none"> -Contacts And coordinates with the non-proliferation of chemical weapons organization regarding the provisions and the convention implementation. -Ascertains the compliance with all governmental military and civil parties, each per its specialty. -Sets complete instructions to 	Ministry of Interior	Ministry of Interior, a military representative of The Public Security Directorate, Civil Defense Directorate, Ministry of Foreign Affairs Ministry of Agriculture, Ministry of Health, Ministry of Industry and Trade, Free Zones Corporation, Customs Department R .S .S General Headquarters of the	Chemical Weapons Non-Proliferation Treaty	1

		<p>follow up control over incoming and outgoing chemicals to and from Jordan, measures of production, transport, storage, and trading in such materials in consistent with the convention's provisions.</p> <ul style="list-style-type: none"> - Continued follow-up of all technical sides of the convention - Forwards recommendations to the general Headquarters about certain measures to ascertain Jordanian Commitment to the stipulated provisions of the convention. 		<p>Jordan Armed Forces, Jordanian Universities representative, Amman Chamber of Industry, Ports Authority and Association of Clearance Companies Owners</p>		
12.	Veterinary Medicines Registration	Veterinary Medicines, Biological Products And Animal Growth Regulators Registration	Ministry of Agriculture	<p>Pharmacy and Pharmaceutical Control Section Head at the Directorate, Vet. Lab Section Head, Veterinarians Association, Pharmacists Association, Ministry Of Health, Ministry Of Industry and Trade, veterinarian drugstore owner, A veterinarian representing drugs factories</p>	Temporary Agriculture Law No 44 for the Year 2002	

13.	Technical Committee for Environmental Effect Studies Assessment Review	Reviews the studies reports of the environmental effect of the presented projects to obtain the license, and give remarks on the studies quality, and makes recommendation for approving the presented studies when meeting the approved studies requirements	Ministry of Environmental	Ministry of Environment, Ministry of Health, Ministry of Water and Irrigation, Ministry of Energy and Mineral Resources, Ministry of Tourism and Antiquities, Ministry of Industry and Trade, Ministry of Planning, Jordanian Environment Society, university of Jordan, Technology and Science University, Hashemite University, Al Balqa' Applied University	Regulation for Evaluation of the Environmental Effect No. 37 for the Year 2005	1
14.	Central Licenses Committees	Approves locations for setting up developmental project	-Ministry of Environment.	-Ministry of Environment. -Ministry of Municipal Affairs. -Ministry of Water and Irrigation. -Ministry of Health. -Ministry of Agriculture. -Natural Resources Authority.	Temporary Environment Protection Law no.(1) for the year 2003	1
15.	Pesticides Factories Control Committee	Inspects pesticides factories to make sure that they meet all the conditions and requirements specified in the instructions	Ministry of Agriculture	Three specialists from the Ministry (Internal committee)	Regulations no. (g/22) for the year 2003 pursuant to the Temporary Agriculture Law No 44 of 2002	1

(1) Excellent, (2) Medium, (3) Weak

Chapter Eight

Data Availability and Use

This chapter aims at providing an overview of the availability of data information about chemicals management and the related infrastructure, and to analyze how to use such information to minimize chemical hazards at the national level.

(8-1) Availability of Data for Local Chemicals Management.

Table (8-1) shows the quality and quantity of national information available in Jordan

Data Urgency of Need and the Cause of Need	Agricultural and Public Health Pesticides	Industrial Chemicals	Chemicals used by consumers	Chemical Wastes
Extent of availability of information required to specify priorities	x	NA	NA	?
Availability of information required to assess chemicals impacts within local conditions	?	?	NA	NA
Availability of information required to classify and label chemicals	x	x	x	
Risk assessment on environment and health	Available	Available	NA	NA
Chemicals Registration	x	For some materials only	NA	NA
Licensing	x	For some materials only	x	NA
Import and Export Permits	To enter under a delivery permission	X	x	NA

Decisions taken to minimize risks	x	x	x	NA
Preparation and re response to face accidents	NA	?	?	NA
Chemicals poisoning control	x	?	?	NA
Inventory of Emissions	NA	NA	NA	NA
Health and environment inspection and investigation	?	?	?	No specific Mechanisms for control and collection of information
Information required for educating workers in various industrial institutions	Available but not directly to workers	Available but not directly to workers	Available but not directly to consumers	
Extent of availability of information required for the public on chemicals management	?	?	?	?

"X" in the box means availability of information specified in the first column.

"?" in the box means weakness in availability of information in the first column.

Redraft based on new information

Table (8-1) shows that, so far, there are no required studies and researches on the impact of chemicals. As for registration of chemicals, whether they are raw or finished products, work is under way to draw up a national register on chemicals at the Ministry of Health/ Environmental Health Directorate and efforts are being made to collect the information from various plants. The Register, when finalized, would provide data on raw and finished products in the factories in addition to information on hazardous wastes and how to handle them.

As to the accidents related to chemicals, there are no accurate statistics in the Kingdom. Also, there are no local studies on the evaluation of risks entailed from exposure to pesticides or chemicals. However, chemicals generating emissions, there are no figures on the quantities of produced emissions.

(8-2) National Information Website

Table (8-2) shows determination of available data related to chemicals in order to give information on how to obtain them

Table(8-2): National Information Websites and How to obtain them

Type of Data	Information website	information Source	Who is accessible to the information	How to access information	Information Format
Produced chemicals Statistics	General Statistics Dept. (G.S.D.)	Ministry of Agriculture, Ministry of Health and Ministry of Industry & Trade	All	Personal visit, Internet	Database
Imported chemicals Statistics	(G.S.D.), Customs Dept.	Ministry of Industry Ministry of Finance (Customs) Ministry of Health	Concerned parties	Personal visits, Internet and Official letters	Documented reports and Database
Exported chemicals Statistics	Ministry of Industry Trade, Customs Dept. and G.S.D.	Ministry of Industry & Trade, Ministry of Health	Concerned individuals	Personal visit, computer, and mail	Documented reports and Database
Chemical used in industry statistics	Not available	Not available	Not available	Not available	Not available
Reports of Industrial accidents caused by chemicals	Ministry of Labor, Social Security Corporation and Civil Defense	Ministry of Labor, Social Security Corporation, Civil Defense and Ministry of Environment	Competent Parties (Concerned Bodies)	Official letters Computer	Documented reports
Reports of Accidents caused by chemicals transport	Civil Defense, Ministry of Environment. Public Security	Civil Defense, Ministry of Environment. Public Security	Competent Parties (Concerned Bodies)	Official letters Computer	Documented reports
Occupation Health data (Agricultural)	Ministry of Health, Ministry of Agriculture, Ministry of Labor, Social Security Corporation	Ministry of Health, Ministry of Agriculture, Ministry of Labor, Social Security Corporation,	Concerned Institutions	Official letters	Documented Reports
Occupation Health data (Industrial)	Ministry of Health, Ministry of Labor, Social Security Corporation	Ministry of Labor, Social Security Corporation, Ministry of Health	Concerned Institutions	Personal visit Official letters	Documented Reports
Statistics on Chemical Poisoning	Ministry of Health, Civil Defense, Public Security	Hospitals, Comprehensive Health Centers, Civil Defense, Public Security	All	Official letters and Reports	Documented Reports

Hazardous chemical wastes data	Ministry of Health	Ministry of Health, Ministry of Environment	Competent parties	Official letters, computer	Document Reports and Computerized Reports
Pesticides Registration	Ministry of Agriculture	Ministry of Agriculture	All Concerned parties	Internet, official letters	Databases
Chemicals Registration	Ministry of Health	Ministry of Health	All	Official letters, Computer	Databases
Inventory of existing chemicals	NA	NA	NA	NA	NA
Imported chemicals Registration	Ministry of Health, Ministry of Agriculture and Public Security	Ministry of Finance (Customs Department)	Concerned officials	Officials letters	invoices of chemicals Import
Chemicals producers Registration	Ministry of Industry and Trade, Amman Irbid and Zarqa Chambers of Industry	Ministry of Industry and Trade, Amman, Irbid and Zarqa Chambers of Industry	All	Personal visits, computer publications and CD+, official Letters	Database
Radioactive Registration	Atomic Energy Commission	Atomic Energy Commission	Concerned parties	Officials letters	Database
Decisions taken on voluntary action for the prior approval of chemicals and pesticides for PIC	Ministry of Health and Ministry of Agriculture	Ministry of Health and Ministry of Agriculture	Concerned bodies	Personal visit ,official letters	Documented reports

It is noticed from table (8-2) that there is a shortage in the availability of integrated information in terms of its location, source, quality and quantity

(8-3) Steps of Collection, publishing and distributing national information

Article 7, of the regulation for management and handling of harmful and hazardous materials, issued under the Environment Protection Law, stated that the industrial, and vocational plants and scientific and medical centers etc...should periodically provide the Ministry of Environmental, as decided by the ministry, with the chemicals and physical types of the materials and their quantities used for its various purposes. However, this regulation is not activated till now, as required and these institutions are not obligated to submit the required information.

The Ministry of Health Temporary Law No. 54 for the year 2002 includes a chapter about chemicals management. The Ministry of Health will have the legal instrument to obligate factories to provide it periodically with the required information on the uses and handling of chemicals conditioned by it.

Right now there is no integrated data on the effect of chemicals on health and environment as required.

Steps of collecting local information and importance of collection included in the: National Strategies and Policies of Information document "Preparing Jordan for the 21st century " National Information Technology Center, 1998 are:

- Value of Chemical Information

Value of information depends on its accuracy; modernity and method of use in a way to bring about benefit in decision-making, which supports the sustainable development and chemical information acquisition as a long-term educational tool depending on the required applications.

- Needs Assessment

Prior to application of any information system, either on the organizational or national level, it is important to appraise the suitable need, which shall be the best guarantee for success, and to avoid the loss of valuable sources and human resources.

- Continuous Needs Assessment

The needs of information users require development and change. The information providers must monitor the changes relevant to information users. The assessment of needs should not be considered as a need for one-time-occurrence.

- Reciprocity & Inter-Dependence of Information

Integrated and comprehensive need for information. As most corporations related to chemistry, need information from each other, therefore, the evaluation of comprehensive national chemical information availability is very important in reducing the search time .

-Training & Awareness & Synergism

There is a need for awareness programs and training for all segments of the society on the use and handling of chemicals through the audiovisual media...etc. So, the continuous training enhances the role of the information supplier and user. The awareness and training programs on the use of information and method of adding the personal feature to it in the future, is part of providing information and facilitating the access to it.

- Timely Dissemination of ready use Information

The information prepared by specialists in the chemical sector, not in its raw form, is considered very important and useful to users. It makes them in contact with most up-to date chemical information.

(8-4) International References Availability

Table 8-4 shows the extent of international references availability, location, who has access thereto, means of obtaining the information and identifies the type of such references from various international organizations such as: WHO, IPCS, UNEP, FAO and others.

TABLE 8-3 International References Availability regarding chemicals management and how to obtain them

Available References	Reference Website	Who has Access to the reference	How to access the reference
Environment Health Criteria documents/(WHO)	-Ministry of Health -Aqaba Special Economic Zone Authority (ASEZ)	Concerned Persons	- Personal Visit - Official letters
Health and Safety Guides (WHO)	Ministry of Health	Concerned Persons	Personal Visit
International Chemical safety data cards (IPCS/EC)	-Ministry of Health -ASEZ	Concerned Persons	Personal Visit
Decision Taken Documents for PIC (FAO/UNEP)	-Ministry of Health - Ministry of Agriculture	Concerned Persons	Personal Visit
Pesticides Safety Data sheet FAO/WHO	-Ministry of Health - Ministry of Agriculture -ASEZ	Concerned specialists	Personal Visit
Documents from the FAO/WHO meeting on Pesticides Residues	-Ministry of Health -Ministry of Environment -Ministry of Agriculture	Concerned specialists	Personal Visit
Information card on safe handling of chemicals (MSDS)	-Ministry of Health -Ministry of Agriculture Ministry of Environment	Concerned Parties	Personal Visit
OCED Guidelines for the testing of chemicals	- Ministry of Agriculture	Concerned Parties	Personal Visit
Principles of good manufacturing practices	- Ministry of Health/ Pharmaceutical factories		
Principles of good Laboratory work practice	NA	NA	NA

WHO/UNEP Global Environmental Libraries Network	-Ministry of Health - Ministry of Environment	Concerned specialists	Personal visit
Computerized IMOG Code	Ports Authority	All	Internet
ILSA Information System	Ports Authority	All	Internet
AUDIO System	Ports Authority	All	Internet
Index Merck	Ports Authority	All	Internet

The increased attention towards the Environment by the Jordanian universities and members of the community has generated environmental information including the following:

- Qualified specialists in the environment field
- Training Centers
- Environment education and awareness
- Transparency and sensitivity environmental information distribution.
- Providing the required human resources, special skills, and suitable training.
- Special-training on topics related to environment such as quality control and productivity.
- Special-training for suppliers on the skills of environment management and technical information including publication and assessment of user needs for environment information.
- Wide-scale education and training comprising skills of financing of environmental information
- Facilitating the process of experimental transfer.
- Training and quantifying networks engineers on electronic communication.

It has become necessary to develop communication by the international information systems through Internet data and systems so as to facilitate access to the programs of UNEP, WHO and other UN bodies concerned with the management of chemicals for the following reasons:

- Review the expertise of other countries in chemicals management enhances chemical safety in Jordan through the adoption of a well-established system in this field, taking into consideration the local circumstances from all aspects.
- The possibility of obtaining, on up-to-date basis, new information, studies and researches conducted on the effects of chemicals on health and environment.
- Obtain lists of banned and restricted chemicals for updating the approved lists at the national level and consequently improve the control mechanism on the handling of such materials.

(8-5) Availability of International Databases

Table (8-5) shows the availability of international databases in Jordan in the form of diverse data and their websites whether they are within the CD-ROM or Floppy Disks or others and the location of such database.

Table (8-4) Available International Databases

Database	Database Location	Who has access to it	How to access
IRPTC	-Ministry of Health -ASEZA	Any specialist who needs it	Personal visits Official letter
INCHEM	-Ministry of Health - ASEZA	Any specialist who needs it	Personal visits Official letters
Global Information Network on Chemicals (GINC)	NA	-	-
STN	NA	-	-
MICROMEDIX TOMAS	-Ministry of Health - ASEZA	Anybody who needs it	Personal visits computer
CHEM BANK PLOTXI	Ministry of Health - ASEZA	Anybody who needs it	Personal visits computer
IPCS INTOX	Ministry of Health - ASEZA	Anybody who needs it	Personal visits computer
HAZCHEM	- Civil Defense	Anybody who needs it	Personal visits computer
HAZMAT	- Civil Defense	Anybody who needs it	Personal visits computer

(8-6) National Information Exchange Systems

1) Environmental Sector Committee

In view of multiplicity of the bodies concerned with the management of chemicals and consequently the multiple functions and methodology of each of them, the environment sector committee at the National Information Center decided to select a national sub-focal point to coordinate information for the concerned authorities on a special internet page located in Environment Health Directorate. The Governmental parties and industrial corporations are provided with the information needed on the variety chemicals via fax, personal visit, and e-mail. It has recently been connected within the internet network of the National Information Center so as the information would flow easily to the participants in the Environment Sector of the National Information Center and researches, and thus, helps the decision-makers obtain information on the spot. For the time being, all-

important information on the internet page, relevant to chemicals has been completed as the available information on chemicals within the reach of all parties collected. Also, the electronic link with the Customs Department was completed.

- Information on Chemicals, which can be provided through the focal point

- 1- Role of Ministries and institutions in chemicals management.
- 2- Laws, Regulations and Legislations relating to such ministry and institutions.
- 3- Restricted and banned chemicals lists.
- 4- Imported chemicals lists.
- 5- Studies, researches and projects related to chemical safety.
- 6- Awareness and education in the field of chemical safety.
- 7- Databases available with Ministries and international authorities in the chemicals field.
- 8- Available chemical laboratories and their purposes for detecting health and environmental hazards of chemicals.
- 9- Monthly and/or annual statistics and reports on chemicals in so far as the imported quantities, use, industrial waste, and other statistics related to chemicals.
- 10- Available and working cadres in the field of chemicals management.
- 11- Available information on transporting chemicals in the country in terms of the method and safety requirements.
- 12- Chemicals Events.

Site Address: <http://www.cic.gov.jo>. this site is presently effective on the National Information System and contains available information related to the captioned subjects.

2) Jordanian Integrated Information System for Hazardous Materials Management:

This system is a multi- level national project which became operational in 2003. The current second stage is expected to be completed in 2006 . This project was funded by the Swiss Agency for Development and Cooperation. It is being implemented by the Royal Science Society with the collaboration of the concerned ministries and bodies.

- The Project Objectives:

1. Establishing an automated system to manage and control the hazardous materials.
2. Providing the user with a database including information cards for the safety use of materials.
3. Providing a comprehensive database on the hazardous materials in Jordan.
4. Promoting the documentation of transport, handling, granting licenses for hazardous material procedures and control.
5. Providing the decision makers with up-dated statistical information and giving them a clear image about the hazardous material types, uses, and their locations in Jordan.
6. Updating and coordinating the control methods on hazardous materials among ministries.
7. Creating an integrated national chemical list for the prohibited and restricted materials.

The Functional Specifications of the System:

The project depends on an integrated network system controlling all operations performed by the concerned ministries. Every ministry will be able to have access to the comprehensive integrated database of the hazardous materials where these materials are being used and handled in Jordan. The ministries will be able to insert the information on the hazardous materials production, import, receipt and sales, besides the related accidents.

The Customs Department will be provided with a tool to define any material through its CAS No., the scientific name and trademark before being allowed in Jordan.

The Concerned Organizations

Despite the fact that there are many ministries and corporations concerned with hazardous materials management, the current stage shall cover the following ministries and institutions:

- Ministry of Environment.
- Ministry of Health/ Environmental Health Department.
- Ministry of Industry and Trade/ Development Directorate.
- Ministry of Agriculture, Vegetation Protection Directorate, Veterinary Directorate, Lands and Irrigation Directorate
- Customs Department.

The system will be expanded to include the following institutions:

- Ministry of Interior
- Public Security Directorate
- Civil Defense Directorate
- Jordanian Food and Drugs Administration
- Aqaba Special Economic Zone.
- Ports Authority
- Free Zones Corporation
- Industrial Estates Corporation
- Ministry of Water and Irrigation
- Ministry of Transport
- Amman Chamber of Industry.

The Role of the Government

- Establishes and enhances the infrastructure of IT such as communications, and provides establishment/ institution with the necessary equipment.
- Provides every possible assistance to others for the implementation of their functions and duties.
- Creates a critical audience able to contact foreign experts and information centers to evaluate the environmental impacts. The skills may cover the ability to write the proposed projects coupled with the knowledge of environmental information technology.
- Reduces the governmental restrictions on passing environmental information for regional use.

- Role of Semi and nongovernmental Organizations

- The NGO's use environmental information and generate some of the information they require through small-scale projects and researches.
- Showing the importance of environmental information to the public through the information media, workshops, meetings ... etc.
- Exert pressure to formulate a draft (Initial Plan), implement a legislation and provide environment information instructions.
- The role of the international organizations such as (UNEP, UNDP, the World Bank, USAID, GTZ...etc._
- Providing necessary know-how and knowledge in order to provide and publish environmental information.
- Funding infrastructure and equipment.
- Providing local training

(8-7) Analysis

- Most databases related to chemicals management are available within the concerned parties on CD's or computerized programs. The existing database is updated whenever necessary and according to the financial potentials available thereto.
- Governmental institutions can obtain mutual information through official correspondence. However, the information cannot be obtained through electronic linkage. Some of the concerned parties work through a bureaucratic system which tightens the grip on the distribution of official environment information. This creates difficulties in exchanging information with NGOs, with due consideration of the confidentiality and privacy of some information.
- Sometimes, it is difficult for the public to get the available information from the government institution. This drives them away, of being a pressure group, from participating in the decision making, or affecting each other in health and environment issues, and sometimes conceals this role.

Chapter Nine

Available Potentialities

(9-1) Available Laboratories

There are many laboratories for the ministries and different departments, which are fully equipped with technical potentials to analyze chemical materials and identify quality whether raw chemicals or manufactured or residuals. The purpose is to maintain and control the application of national specifications.

Some of the labs are:

- Ministry of Agriculture Labs.
- Ministry of Agriculture Labs. (The National Center for Research and Technology Transfer)
- Ministry of Health Labs(MOH)
- Ministry of Water and Irrigation Labs.
- Institution of Standards and Metrology.
- Criminal Laboratory.
- Greater Amman Municipality Labs.
- Quality Control Military Labs./General Command of the Armed Forces.
- Royal Scientific Society Labs.
- Civil Defense Directorate Labs./ Civil Defense Directorate
- General Customs Department Labs (Amman, Aqaba).
- Safety and Occupational Health Institute Lab/ Vocational Training Corporation.

There are many other laboratories belonging to the ministries and institutions, which have not been mentioned and are able to offer their services when required. These labs include:

- Al Balqa Applied University Labs.
- Hashemite University Labs.
- Mu'atah University Labs.
- Other Governmental Universities' Labs
- Private Universities.
- Petroleum Refinery Labs.
- Major Industrial Companies Labs.

Some measuring instruments available at the corporations used for inspection purposes, to measure cars' exhaust and noise as those in the Ministry of Environment.

The following tables show some of the labs available, and the instruments they have for conducting lab tests and the purpose for having such labs.

Ministry of Agriculture Labs

Lab and Location	Available Equipment	Lab Objectives	GLP Membership	No. of staff	Cooperation and Coordination	Participation in the National Information Network
Pesticides residuals labs, Al Hussein Agricultural Station Baqa'	<ul style="list-style-type: none"> - GC. EDC - NPD – GC – - FPD – GC - GC – Mass - Extraction Unit 	Analysis of the effect of pesticides residuals in agricultural product and fodder.	No	5	<ul style="list-style-type: none"> - Royal Scientific Society - University of Jordan 	No
Pesticides analysis labs, Al Hussein Agricultural Station	<ul style="list-style-type: none"> - (FID) GC - GC – Mass - HPLC/UV - HPLC/DIODE array detector - FILTER/IR Detector 	Verification of pesticides conformity to Standards	No	3	<ul style="list-style-type: none"> - Royal Scientific Society - University of Jordan 	No
Quality control lab on veterinary medicines Juwaideh	<ul style="list-style-type: none"> - HPLC Unit. - U.V Chromatography - Distiller - Loss on drying. - Disolvation unit. - Karl fisher. - U.V – lamp. - Centrifuge unit. - Polarimeter. - Filtrations pumps 	Qualitative and quantitative tests and control of local veterinary medicines	No	4	<ul style="list-style-type: none"> - Ministry of Health /Medicinal Control lab 	No

National Center for Research and Technology Transfer

Lab and Location	Available Equipment	Lab Objectives	No. of staff	GLP Membership	Cooperation and Coordination	Participation in the National Information Network
Fertilizers and plants	<ul style="list-style-type: none"> - Incinerator - Wet digestion - Phosphor unit "Spectrophotometer" - Atomic absorption - Burning spectrum - EC - Interaction measurement device - Water distillation - Nitrogen specimen distillation - Micro/macro plant shaker - Dry ovens - Thermal heater - Water bath 	<ul style="list-style-type: none"> - Determine level of various nutrition elements in plant and chemical fertilizers - Determine some of the chemical and physical characteristics for organic fertilizer 	4	No	Governmental and nongovernmental bodies	No
Water and soil analysis lab	<ul style="list-style-type: none"> - PH meter conductivity - Spectrophotometer - Centrifuge - Caciometer - Distillation - Balances - Fume hood - Dryer - Shaker - Atomic absorption 	Analysis of agriculture soil	4	No	Governmental and nongovernmental bodies	No

Ministry of Health Labs

Lab and Location	Available Equipment	Lab Objectives	No. of staff	GLP Membership	Cooperation and Coordination	Participation in the National Information Network
Ministry of Health * Environment Health Directorate Lab * Shemisani behind Marriot Hotel	<ul style="list-style-type: none"> - Atomic absorption Spectrophotometer (Flame/Flameless) - Gas chromatography - Gas chromatography mass selective - Ion chromatography - Spectrophotometer - Microwave Digester - Turbidity meter - PH meter - Electrical conductivity - Oil and grease evaporation - BOD incubator - COD – Meter - Fume hood - Water bath - Incubators - Ovens - Autoclaves - Refrigerator - Balances - Centrifuge - Microscopes - Magnetic stirrer - Flame photometer - Titro processor 	<ul style="list-style-type: none"> - Analysis of different environment specimens. (chemically and biologically) - Specimens biological analysis for identifying toxicants. - Organic materials analysis of various environmental specimens. 	13	<p>At the final stages to obtain accreditation.</p> <p>There is a program for quality control of water tests in coordination with WHO.</p>	<p>Relevant Ministries, official departments and private organizations and with international organizations like:</p> <ul style="list-style-type: none"> - WHO - National Registry of Hazardous chemicals - International Chemical Safety Program - United Nations Environment program (UNEP) - US Environment Protection Agency (EPA) 	Yes

Medical Control Lab * Third Circle Amman	<ul style="list-style-type: none"> - HPLC (5) - Memo Titrator (2) - UV cabinet - Friability tester - Optical rotation (Dextrose) - Flame photometer (Li⁺-K⁺-Na⁺) - Spectrophotometers (6) - Fluorescence - Atomic absorption - Gas chromatography - Dissolution apparatus - Disintegrator - DSC (raw material) - Zone reader - Autoclaves (4) - Laminar flow (3) - Infrared 	Pharmaceuticals control	20	No	<ul style="list-style-type: none"> - Concerned governmental bodies - Medicines factories 	No
Central Labs Directorate * Lab Quality Control Al Salt Street / Amman	<ul style="list-style-type: none"> - Fluorescent microscope - Microscope - Centrifuge - Chemistry analyzer - Flame photometer - Flameless (Easylyte) spectrophotometer - Vortex mixer - ELISA – reader - External printer - ELISA – washer (automatic) - ELISA – washer (manual) - Refrigerator - Haematocrit centrifuge - Cobas micros for hematology 	<ul style="list-style-type: none"> - Analysis of patients' samples - Quality programs 	16	No	Governmental and non-governmental bodies	No

	<ul style="list-style-type: none"> - Electrophoresis scanner - Automated electrophoresis - Distiller - UV light 					
Public Health Lab	<ul style="list-style-type: none"> - ELISA washer - ELISA reader - Biohazard safety cabinet - Fluorescent microscope - Vortex mixer - Autoclave - PH meter - Diminizer 	<ul style="list-style-type: none"> - Malta fever and meningitis - Analysis and confirmation of its health detriments 	5	No	Governmental and non-governmental bodies	No
Food Lab	<ul style="list-style-type: none"> - Gas chromatography - Atomic absorption spectrophotometer - Centrifuge - Gerber centrifuge - Dissecting microscope - Vortex – mixer - UV cabenet - HPLC - Paleography - Kijldal system - PH meter - Refract meter - Densitometer - Composition 	Fitness of food for human consumption	15	No	Governmental and non-governmental bodies	No

Ministry of Water and Irrigation/ Water Authority Labs

Lab and Location	Available Equipment	Lab Objectives	No. of staff	GLP Membership	Cooperation and Coordination	Participation in the National Information Network
Water Chemistry Lab Non-Organic Analyses	<ul style="list-style-type: none"> - Ion chromatograph with auto sampler - Ion chromatograph - Flame photometer - Spectrophotometer - Digital conductivity meter - Bench conductivity/ TDS meter - Titroprocessor with 960 SC sample changers - Atomic absorption spectrometer with VGA vapor generation, accessory and auto sampler - Atomic absorption spectrometer with GTA 96 graphite tube atomizer - Inductively coupled plasma with auto sampler and ultrasonic nebulizer - Turbidimeter - Polarographic analyzer with auto stripping timer, electrochemical detector - Flow injection system with detector, reactor, auto sampler, pump 1, pump 2 - Water purification system - Analytical balance - Hotplate with stirrer - Reverse osmosis water system - Drying oven - Vacuum pump 	Analysis of non-organic in the drinking water of wastewater.	11	Cooperation with international labs holding UKAS in accordance with ISO 17025	Coordination with all concerned labs inside the Kingdom and abroad	No

	<ul style="list-style-type: none"> - Top loading balance - Ultrasonic bath - Refrigerators 					
Organic Analyses	<ul style="list-style-type: none"> - Gas chromatograph fitted with dual detectors ECD and FID with head space analyzer - Kheldahl nitrogen analyzer with digestion unit and scrubber unit - Total organic carbon analyzer with auto sampler - Total organic carbon analyzer - Gas chromatograph/ mass spectrometer with tekmar purge and trap concentrator - Supercritical fluid extractor - Gas chromatograph fitted with ECD, head space analyzer - Gas chromatography/ mass spectrometer with large volume on-column injector sampler and purge and trap concentrator - Gas chromatograph, dual injectors and dual detectors ECD and FID with dual trays sampler - High performance liquid-chromatograph - Water purification system - Rotary evaporator - Concentrator - PH meter - Drying oven vacuum pump - Water bath - Hotplate and stirrer - Analytical balance - Ultrasonic bath - UPS 	Analysis of organic compounds in drinking water and surface water				

	<ul style="list-style-type: none"> - UPS/APC - Refrigerator 					
Isotopic	<ul style="list-style-type: none"> - Gas ration mass spectrometer - Oxygen 18 preparation line - Deuterium preparation line - Inductively coupled plasma mass spectrometer (ICP-MS) - Alpha spectrometer - Electrodeposition set for alpha spectrometry + power supply - Liquid scintillation analyzer - Benzene synthesis line - Tritium preparation line - Radon detector - Radon degassing unit - Muffle furnace - Balance, analytical and top loading - Bench top PH meter - Drying ovens - Ultrasonic bath - Refrigerator - Fume hoods - Full range of field requirements - Field equipment (Eh, pH, EC, T, DO, GPS, Rn and giger counters) - Depth samplers and water sampling equipment and sampling containers - Syringes, filters and ultrapure acid for field sampling - Temperature controllers - Heating mantles 	Conduct isotopic analyses in water	6	Cooperation with international labs holding UKAS in accordance with ISO 17025 for several tests	Cooperation with the International Atomic Agency and concerned labs and research organizations, institutions, and centers.	

	<ul style="list-style-type: none"> - Hotplates (different sizes and temperature ranges) - Computers + printers attached to the instruments 					
	<ul style="list-style-type: none"> - Microscope stereoscope - Microscope - Microbiological safety cabinet - Dark field colony counter - Vacuum water pump - UV lamp - API system - Quanti-tray sealer - Incubator - Bench top - Incubator stand floor - Screen + case for LIMS - Fume hood - Hot-air sterilizing oven - Microwave - Hotplate (magnetic stirrer) - Autoclave - Epifluorescent - Microscope with photo camera - Inverted microscope - Centrifuge (speed from 0-5000 rpm) - Fluorometer with lab stomacher - Homogenizer - Magnetic stirrer - Roll dish - Hot air oven - Water distiller 	Conduct biological and microbiological analyses for water and wastewater	8	Cooperation with international labs holding UKAS in accordance with ISO 17025 for several tests	Cooperation with all concerned labs nationally and internationally and with international institutions	

	<ul style="list-style-type: none"> - Slide warming tray - Bench 					
Drinking Water Control Department Mobile Lab	<ul style="list-style-type: none"> - Spectrophotometer test kit - Turbidimeter - pH/ion meter - Do-meter - Conductivity meter - COD reactor - Incubator - Water bath - Distillation unit - Vortex - GPS - Autoclave - Fume hood - Hot plate - Residual chlorine meter - pH/DO/Conductivity test kit - conductivity/ TDS meter - Do-meter - Spectrophotometer - Refrigerator - Filtration kit - Water purification system 	Control of drinking water sources	8	Obtained some field tests for a certificate from UKAS in accordance with ISO 17025	Concerned bodies	No
Environmental Control and Assessment Department	<ul style="list-style-type: none"> - PH meter - DO meter - RC meter - Digital thermometer - Turbidity meter 	Control of wastewater, surface water and irrigation water	6	Participant in the international accreditation program according to ISO 17025		

Wastewater Chemistry Department	<ul style="list-style-type: none"> - Atomic absorption - Spectrophotometer - Polarography - Polarography (ISE) - Muffle furnace - Ultra pure water apparatus - UV digester - COD reactor (2) - Drying ovens (105 C°) - BOD incubator - Titroprocessor for BOD - Titroprocessor for COD - Ion chromatograph - ICP-AES - Turbidity meter - TN/TOC analyzer - Gas chromatography/ FID - Flow injection system 	Analysis of wastewater	10	Cooperation with international labs holding UKAS in accordance with ISO 17025	Cooperation with all concerned labs inside the kingdom and abroad	No
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Municipality of Greater Amman Labs

Lab and Location	Available Equipment	Lab Objectives	No. of staff	GLP Membership	Cooperation and Coordination	Participation in the National Information Network
Food Control and Environment Department * Al Istiklal Street	<ul style="list-style-type: none"> ▪ Inductively coupled ▪ Plasma (ICP) ▪ Flame photometer ▪ COD reactor ▪ Refractometer ▪ Super critical fluid extractor ▪ Spectrophotometer ▪ Gas chromatography ▪ Electronic balance ▪ Polarometer ▪ Automatic titrator ▪ Fume hood ▪ Muffle furnace ▪ Conductivity meter ▪ Rotary vaporator ▪ Distillation unit ▪ Moisture balance ▪ Centrifuge ▪ Milku scan ▪ Melting point ▪ Microscope ▪ Incubator ▪ Safety cabinet ▪ Autoclave ▪ CO₂ incubator 	Control and assess results on the basis of Jordan Standards and public health law.	50	No	With different governmental bodies like: <ul style="list-style-type: none"> - Institution of Standards and Metrology - Ministry of Health - Ministry of Industry and Trade - Ministry of Supply - Universities - Royal Scientific Society 	No

Institution of Standards and Metrology Labs

Lab and Location	Available Equipment	Lab Objectives	No. of staff	GLP Membership	Cooperation and Coordination	Participation in the National Information Network
Institution of Standards and Metrology * Labs Directorate * Abdali	- Atomic absorption Spectrophotometer (Single beams and double beam) - Flame photometer - Kjeldanthean (for protein determination) - Nitrogen/protein analyzer - Microwave pressure digestion - Centrifuge - Kjeldhal nitrogen - Karl fisher - Milkoscan - GC FID - GC EST - Water still	Verify conformity with Jordanian Standards	10	Not awarded GLP *** Awarded ISO (9002)	- Royal Scientific Society - Municipality of Greater Amman - Ministry of Health - Ministry of Agriculture	Yes

Institution of Safety and Occupational Health Labs

Lab and Location	Available Equipment	Lab Objectives	No. of staff	GLP Membership	Cooperation and Coordination	Participation in the National Information Network
Institution of Safety and Occupational Health Labs	<ul style="list-style-type: none"> - Atomic absorption - Spectrophotometer - Gas chromatography - UV spectrophotometer - IR spectrophotometer 	Analysis of work environment samples	4	No	= = =	No

Public Security Directorate Labs

Lab and Location	Available Equipment	Lab Objectives	No. of staff	GLP Membership	Cooperation and Coordination	Participation in the National Information Network
Labs and Criminal Evidences Department * Amman/Tabarbour	<ul style="list-style-type: none"> - HPLC - Gas chromatography (GC) - GC mass - UV spectrophotometer - IR spectrophotometer - Atomic absorption - Polargraph - X-ray defractometer - Environmental - Electroscanning microscope 	Criminal	31	No	All ministries and institutions related to chemicals management	In the process pf participation

Jordan Armed Forces Lab

Lab and Location	Available Equipment	Lab Objectives	No. of staff	GLP Membership	Cooperation and Coordination	Participation in the National Information Network
Military Quality Control Labs	<ul style="list-style-type: none"> - Gas chromatography (GC) - High pressure liquid chromatography (HPLC) - Atomic absorption (AA) - Fortier transmittance infrared (FTIR) - Differential scanner calorimetric (DSC) - Aflatoxin tester (Elisa) - Meat analyzer by IR instrument - Khilahal protein analyzer - Glutein taster - Fat extraction - Spectrophotometer - Near infrared analyzer (NIR) - Microbial activity analyzer - Microwave digester - Rotary evaporator - Tensile strength tester - Flash point tester - Burst tester 	Biological, chemical and physical test of foodstuff and water for the Armed Forces and public and private sectors			Cooperation agreement with RSS in the process of signature	No

	<ul style="list-style-type: none"> - Thickness meter - Polarity meter - Conductivity meter - PH meter - Autoclave - Laminar flow (safe lab cabinet) - Different types of incubators - Refractive index - Microbial water analyzer (IDEXX) - Different water baths - Ultra sonic water bath - Shaker/mixers, centrifuges - Hydro static head tester - Wira steam cylinder - Automatic cloth washer - Scorch tester - Spray tester 					
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Ministry of Public Works and Housing Labs*

Lab and Location	Available Equipment	Lab Objectives	No. of staff	GLP Membership	Cooperation and Coordination	Participation in the National Information Network
Labs and Research Directorate * Chemical branch (Amman- Abdaly) near the Parliament building	<ul style="list-style-type: none"> - Equipment for testing ratio of ash in asphalt - Equipment for testing ratio of chloride and sulfur in the aggregate - Equipment for testing gravel soundness - Equipment for testing ratio of organic materials - Equipment for testing stripping in dynamic age 	Conduct necessary testing of construction materials for projects through project visits program (quality control program)for the projects implemented and supervised by the Ministry of Public Works and Housing	4	Labs Directorate is awarded ISO 9002 since 2/8/1998	<ul style="list-style-type: none"> - RSS - Jordanian universities - Institution of Standards and Metrology - Engineers Association 	No

* No update of the information of the profile of 2002 was received.

Royal Scientific Society Labs

Lab and Location	Available Equipment	Lab Objectives	No. of staff	GLP Membership	Cooperation and Coordination	Participation in the National Information Network
Environment Research Center	<ul style="list-style-type: none"> - Ion chromatography - Centrifuge - Flame photometer - Titro processor - Turbidity meter - Ultrasonic - COD Digester - HPLC - PH meter - Distillation units - GC - THM's Detector integrator - UV spectrometer - Spectro fluorometer - Conductivity meter - TOC Analyzer - Nano pure unit - Ovens - Kjeldahl digestion - Furnace oven - CN distillation unit - Solar AA (M6) - ICP-MS - 	Analysis of water, wastewater, sludge, soil, heavy metals, fish and plants.	17	UKAS JAZ	National and international institutions	Yes

Industrial Chemistry Lab	<ul style="list-style-type: none"> - HPLC - Chromatography - GC - Flame photometer - X-ray fluorescent - UV spectrophotometer - FT-IR spectrophotometer - AA - ICP - Salts spry machine - Calorimeter 	Analysis of organic and non-organic chemicals for industrial purposes.	50	UKAS DAR JAZ	<ul style="list-style-type: none"> - Public sector - Customs - Institution of Standards and Metrology - National and international organizations 	Yes
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Natural Resources Authority Labs

Lab and Location	Available Equipment	Lab Objectives	No. of staff	GLP Membership	Cooperation and Coordination	Participation in the National Information Network
Labs Directorate * Bayader Wadi Seer	- X-ray fluorescent - X-ray diffraction - Ion chromatography - Atomic-absorption (flame/flameless) - Gas chromatography - Spectrophotometer - Thermal gravimetric analyzer - Oil content determination - CHN,S-analyzer	Test all types of soil, rock and oil rock and everything related to underground metals to determine the extent of its utilization or use in the national industry	60	Through standards approved in chemical analysis by approving international standard samples and through recognized magazines.	- Jordanian universities and institutes labs - RSS - Ministry of public works - Ministry of water	Yes

Civil Defense Lab

Lab and Location	Available Equipment	Lab Objectives	No. of staff	GLP Membership	Cooperation and Coordination	Participation in the National Information Network
Civil Defense	<ul style="list-style-type: none"> - GC / Ms system - Fume hood - Microscope - Automatic flash point tester - Viscometer digital type - Combustion gas analyzer deluxe - Vortex mixer - Hot plate with magnetic stirrer - Digital balance - Water stills - Analytical sieve shaker - Electronic precision - Digital balance - Desiccators - Beaker shaker - Vacuum pump - Tension and compressing testing - Hydrostatic pressure testing - ovens 	<ul style="list-style-type: none"> - Test of inflammable materials content and quality of inflammable material - Test of fire extinguishing powder - Test of hydrostatic pressure of hand fire extinguisher - Test of hoses pressure strength - Test of strength of adhesion between different layers of hoses. 	4	No	With all government and non-government agencies	No

General Customs Department labs

Lab and Location	Available Equipment	Lab Objectives	No. of staff	GLP Membership	Cooperation and Coordination	Participation in the National Information Network
General Customs Dept. * Amman Lab	- X-ray - GC - Nirfiber protein analyzer - PH meter - Soxtherm - Colorimeter - UV spectrometer - Distillation - Surface tension - Bursting - Strength tester - Tensile strength tester - Refractometer - Microscope - Auto flash - Refractometer	- Test and analysis of chemicals referred to it by different customs centers to identify nature of material - Determine customs duties and general sales tax.	6	No	Different governmental departments	No
Customs Lab * Aqaba	- C-S determination - UV spectrum - AAs. - GC - KF counter - Gerber - IR	- Test and analysis of chemicals referred to it by different customs centers to identify nature of material - Determine customs duties and general sales tax.	6	No	Nil	No

Industrial Estates Corporation Lab

Lab and Location	Available Equipment	Lab Objectives	No. of staff	GLP Membership	Cooperation and Coordination	Participation in the National Information Network
King Abdullah II Industrial Estate Lab And Al Hussein Industrial Estate Lab And Maan Industrial Estate Lab	<ul style="list-style-type: none"> - Vacuum pump - Flame photometer - Spectrophotometer - PH-meter - EC/TDS meter - Refrigerator - Vortex mixer - Microscope - Autoclave - Fume hood - Water – bath - COD Reactor - BOD incubator - Muffle furnace oven - Analytical balance - Centrifuge - Hot plate with magnetic stirrer - Rotary evaporator - Colorimeter 	<ul style="list-style-type: none"> - Analysis of wastewater resulting from manufacturing processes, drained into the sewerage network to ascertain its conformity with the Standards - Analysis of samples for supervising the treatment plant from the operational aspect - Analysis of drinking water - Analysis of samples of wastewater, drinking water upon the investor's request. 	11	No	Government and non-government bodies	No

Aqaba Special Economic Zone Lab

Lab and Location	Available Equipment	Lab Objectives	No. of staff	GLP Membership	Cooperation and Coordination	Participation in the National Information Network
Environment and Food Lab at ASEZA	All equipment necessary for conducting environmental tests and chemicals identification tests and foodstuff tests.	Control of environment, chemicals and food	50-60	Lab will be awarded ISO17025		

Work at the lab will commence in 2006

Jordan Atomic Energy Commission Labs*

Lab and Location	Available Equipment	Lab Objectives	No. of staff	GLP Membership	Cooperation and Coordination	Participation in the National Information Network
Calibration of Radiation Prevention Directorate*	<ul style="list-style-type: none"> - Various equipment to detect radiation pollution and measure radiation doses - Automatic radiation observatory stations linked with computer round the clock and distributed in different parts of the kingdom 	<ul style="list-style-type: none"> - Conduct radiation tests - Measure Gamma rays level in the air - Calibration of radiation test equipment 	5	No	<ul style="list-style-type: none"> - Civil Defense - International Atomic Energy Agency (IAEA) 	No

Licensing and Inspection Directorate	<ul style="list-style-type: none"> - Various equipment for quality control of diagnostic x-rays and nuclear medicine - Equipment for measuring and detecting radiation doses of Beta, Gamma, neutrons and x-rays 	<ul style="list-style-type: none"> - Quality control - Qualitative control - Measuring radiation doses for radiation prevention and license 	5	No	IAEA	No
Applications and Labs Directorate	<ul style="list-style-type: none"> - Liquid flash detector - Atomic absorption spectrometer - Spectrometer measure - HPGE - Spectrometer Alfa and Beta system 	<ul style="list-style-type: none"> - Qualitative and quantitative detection of liquid isotopes - Determination of residuals, impurities and trace elements in different samples... etc. - Analysis of Gamma, Alfa and Beta rays 	7	No	IAEA	
Polymerized materials testing lab	Different equipment for polymeric materials testing	Test polymerized materials prior/after radiation	2	No	IAEA	No
Nuclear Agriculture Section	<ul style="list-style-type: none"> - Laminar flow - Growth room - Germinator - Distillation unit - Other miscellaneous equipment 	<ul style="list-style-type: none"> - Create hereditary "inventions" in field crops to produce anti-dryness brands - Plant tissues culture 	2	No	-Ministry of Agriculture - IAEA	No

Gamma rays radioactive unit	- Gamma Research Radioactive Unit- 3900 Korean made Co-60	- Research to studies in all fields	1	No	IAEA	
	- Multipurpose Gamma radioactive unit 78000 Korean made co-60	- Sterilization of medical supplies	7	No		

* No update of the information of profile 2000 was received

Al Hussein Thermal Power Plant labs

Lab and Location	Available Equipment	Lab Objectives	No. of staff	GLP Membership	Cooperation and Coordination	Participation in the National Information Network
Water Lab	<ul style="list-style-type: none"> - PH meter - Conductivity meter - TDS meter - Spectronic photometer - Atomic absorption - Flame photometer - Turbidity meter - Dissolved oxygen meter 	Analysis of raw water samples and water treatment	7	Yes	<ul style="list-style-type: none"> - Ministry of Health - Royal Scientific Society 	No

Oils lab	<ul style="list-style-type: none"> - Viscosity meter - Flash point (closed and open cup) - Pour point - Total acid number - Red wood meter - GC - Orsat test: Co, Co2 and O2 - Sulfur in oil analyzer - Oil content analyzer 	Test of oils and fuels	7	Yes	<ul style="list-style-type: none"> - Ministry of Health - Royal Scientific Society 	No
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* No update of the information of profile 2002 was received

Aqaba Thermal Powers Plant Labs*

Lab and Location	Available Equipment	Lab Objectives	No. of staff	GLP Membership	Cooperation and Coordination	Participation in the National Information Network
Water and Oils Lab	<ul style="list-style-type: none"> - PH meter - PH meter portable - General conductivity meter - TDS meter - Spectronic photometer - Atomic absorption - C,H,N analyzer - Flame photometer - Turbidity meter - Muffle furnace - Dissolved oxygen - Ultrasonic bath - Microscope - Spectrophotometer - Dielectric strength tester - Gas bubbles separation - Apparatus determination - Channel calorimeter - Adiabatic calorimeter - Dens meter - Dens meters set - P,M.C.C flash point tester - Carbon residue apparatus 	<p>Analysis of raw water samples and water treatment</p> <p>Test of oils and fuels</p>	14	Yes	<ul style="list-style-type: none"> - Ministry of Health - Royal Scientific Society 	No.

<p>Continued</p> <p>Water and Oils Lab</p>	<ul style="list-style-type: none"> - Technical balance - Top pan balance - Electro depositor - Automatic gas analyzer - Oven-forced air circulation - Viscosity meter - Flash point (close and open cup) - Pour point - Total acid number - Red wood meter - Gas chromatography - Orsat test: CO, CO₂, O₂ - Sulfur in oil analyzer - Oil content - Oxygen meter - Lovibond colorimeter - Karl fisher titrator - Interfacial tension meter - C.O.C flash point tester. 	<p>Analysis of raw water and thermal treatment</p>	<p>7</p>	<p>Yes</p>	<ul style="list-style-type: none"> - Ministry of Health - Royal Scientific Society 	
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* No update of the information of profile 2002 was received

Some Jordanian Universities Labs*

Lab and Location	Available Equipment	Lab Objectives	No. of staff	GLP Membership	Cooperation and Coordination	Participation in the National Information Network
University of Jordan Faculty of Engineering and Technology	<ul style="list-style-type: none"> - Distillation - HPLC - Gas chromatography - Atomic absorption 	<ul style="list-style-type: none"> - Educational - Engineering - Consultations - Analysis of some materials for consultations 	10	No.	Provide environmental consultations for local and pharmaceutical industries	Yes
Faculty of Science Lab	<ul style="list-style-type: none"> - Microscope - PH meter - Flame photometer - Lipid and protein - Digestion equip. - Centrifuge 	<ul style="list-style-type: none"> - Educational and consultancy (analytical) 	10	No	General consultations Pharmaceutical industries	Yes
Jordan University of Science and Technology Chemical Engineering Labs	<ul style="list-style-type: none"> - Atomic absorption - Spectrophotometer - Gas chromatography - Gas liquid - Chromatography (GLC) - Differential thermal - Analyzer (DTA). 	<ul style="list-style-type: none"> - Analysis of heavy metals - Analysis of organic materials of low molecular weight - Analysis of organic materials of high molecular weight 	7	No	Inter-University	no

Al Balqa Applied University	<ul style="list-style-type: none"> - Spectrophotometer - PH meter - Colorimeter - Rotary evaporator - Distiller - Melting point apparatus 	Educational	4	No	Inter-University	Yes
Yarmouk University Irbid - Chemistry Dept. Labs	<ul style="list-style-type: none"> - Flame photometer - Centrifuge - I.C maker - Balances, oven - HPLC - Nuclear magnetic Resonance - Gas chromatography - GC/Mass - Infrared - Fourier Transform Infrared 	Teaching and Research	10	No	N/A	
Physics and X-ray Unit	<ul style="list-style-type: none"> - X-Ray diffractometer (XRD) 	Quantitative and qualitative analysis Study of crystals for compounds, elements and alloys	1	No	<ul style="list-style-type: none"> - Universities Natural resources authority - Private companies 	
Geology and Environment Labs	<ul style="list-style-type: none"> - HPLC - GC - Atomic absorption 	<ul style="list-style-type: none"> - Educational and consultative samples 	4	No	<ul style="list-style-type: none"> - Customs - Jordan university of science and technology 	

Chemistry Labs	<ul style="list-style-type: none"> - HPLC - Atomic absorption Spectrophotometer - Gas chromatography GC - Infrared IR - UV double beam - Spectrophotometers Single beam - Calorimeter - PH meter 	<ul style="list-style-type: none"> - The general chemistry lab aims at orienting students how to deal with equipment and chemicals - Analytical chemistry lab aims at orienting students of the precision concept - Inorganic chemistry lab aims at orienting students of the methods of preparing some inorganic compounds - Physical chemistry lab aims at orienting students of chemistry theories. 	7	No	<ul style="list-style-type: none"> - Theories by some teaching staff on many subjects 	
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* No update of the information of profile 2002 was received

(9-2) Information Systems and Hardware Available at the Government Bodies

Table (9-2) shows the types of programs and hardware available at government bodies for chemicals management

Table 9-2 Computer Hardware and Programs used

Entity	Available Information	Programs used	Available Hardware
Ministry of Agriculture	<ul style="list-style-type: none"> - Information about pesticides and agricultural diseases - Instructions regulating the production, import and distribution of pesticides - Pollution charts - Instructions regulating the production, import and export of agricultural fertilizers 	Windows	PCs
Ministry of Health Environment Health Directorate	<ul style="list-style-type: none"> - IPCS inchem DC-ROM - IRPTC - IPCS. INTOX - Micromedex environmental health and safety series - Win Spirs database – Poltox - Silver, Platter - Poisonous chemical international register 	Windows	PCs server
Medicines Directorate	Registration program – prepared by WHO and includes: <ul style="list-style-type: none"> - International and local medical names imported into Jordan, effective material used in medicine, names of factories and manufacturers and country of origin - Registration program (prepared by medicine directorate) and 	Windows, FoxPro, Paradox	PCs, server (network)

	includes names of medicines used in Jordan effective materials used in medicines, name of manufacturers and agent and country of origin.		
Ministry of Irrigation and Water	<ul style="list-style-type: none"> - Water information system - Water quality information system - Water treatment system - Dams management information 	Windows	PCs
Public Security	<ul style="list-style-type: none"> - chemicals classification database (compound, groups) - Narcotics materials and medical drugs databases - Explosives materials database - Toxicant chemicals databases - DNA databases 	Windows	PCs
Civil Defense	<ul style="list-style-type: none"> - Chemical installations information model - Hazardous chemicals manual - Transportation manual - Medical and industrial gases manual - Pesticides manual - Strategic information - Name and addresses of public institutions needed in case of disasters. 	Windows	PCs
Aqaba Special Economic Zone Authority (ASEZA)	<ul style="list-style-type: none"> - Program for permitting transport of hazardous materials on roads - Chemicals control Program inside Aqaba 	2 PCs	Oracle
Ministry of Environment	<ul style="list-style-type: none"> - Agenda 21 project - King Hussein project for environment management, which includes the following information: water, pollution, solid pollutants, soil residuals, desertification, statistics and projects - 	Server (network) PCs	Windows

Municipality of Greater Amman	<ul style="list-style-type: none"> - Solid wastes management information - Water quality - Information about industrial firm - Information about pesticides uses 		6 servers PCs
Ports Authority	<ul style="list-style-type: none"> - World marine system databases - Special lists for hazardous chemicals - Emergency procedures manual (information about hazardous materials in case of emergency) - First aid for accidents resulting from hazardous materials 	Windows Oracle	
National Information Technology Center	<ul style="list-style-type: none"> - National information system www.nic.gov.jo - Environment information network www.environment.gov.jo - Sustainable development network www.sdnj.gov.jo 	Unix	Servers, PCs
General Customs Dept.	<ul style="list-style-type: none"> - SCODA system: processing customs transaction. This system includes names of chemicals mentioned in the imported/exported customs tariff tables, its quantity, country of origin, importer and exporter - Manifest: Follow up registration of customs applications - Accounting: Clearing applications and receipt voucher - Cases: Follow up customs' cases 	Software Windows Oracle FoxPro Unix	Server PCs (P2, P3, Pu, Xeon)
General Statistics Dept.	<ul style="list-style-type: none"> - requirements and wastes used in medical services section and industry sectors - information on the types, names of pesticides and pesticides residuals 	Windows Oracle SPSS	Server, PCs
Jordan Atomic Energy Commission	<ul style="list-style-type: none"> - Radioactive sources register - Radioactive wastes register - Radioactive workers register 	Windows	PCs
Institution of Standards and Metrology	Standard Standards related to the environment (air, soil and water) locally and internationally	Windows	PCs

Queen Alia Airport	<ul style="list-style-type: none"> - Chemicals according to composition and derivatives. - Laws of transporting hazardous materials by air issued by IATA 	Windows	PCs
Safety and Occupational Health Institute	<ul style="list-style-type: none"> - A library containing scientific references - Laser CDs on chemical programs 	Windows	PCs
Industrial Estates Corp.	<ul style="list-style-type: none"> - Names of factories in the industrial estates and nature of production - Liquid and gaseous pollution resulting from factories - Liquid wastes resulting from treatment plants - Wastewater drainage conditions - Environment publications on the effect of pollutants on the treatment plant 	Windows	PCs
Royal Scientific Society	<ul style="list-style-type: none"> - Preventive directory of hazardous materials - Information on quality of water in Jordan, water treatment plant, wastewater treatment and olive oil mills water - Information on air pollutants from emitting factories 	Windows	PCs
Amman Chamber of Industry	Names of factories divided into sectors and products	Windows	PCs
Jordan Environment Society	<ul style="list-style-type: none"> - Information on producing biogas from residuals of cow and sheep - World Globe Program 	Windows	PCs

(9-3) Teaching and Training program

Interest in the issue of teaching and training in chemicals management came out as a natural result of the interest in environmental work. A public or private university is rarely devoid of courses and specializations in the environment and environment engineering within its science faculties. Interest started also by introducing environmental concepts into school curriculum. The Ministry of Education provides information on chemicals through the prescribed science and chemistry periods and its laboratories.

Moreover, some entities provide specialized training, like the Ministry of Health, which through paramedical institutes, teach courses for health controllers, who are given information on chemical pollution. The Civil Defense and the Armed Forces play a vital role in training on how to handle chemical materials and accidents. The Ports Authority holds specialized courses in the method of handling hazardous chemicals transported by sea. Certain governmental authorities also hold workshops and seminars related to chemicals through the projects such as the persistent organic pollutants and the ozone project being implemented currently at the Ministry of Environment.

The Ministry of Labor, Safety and Occupational Health Institute and Vocational Training Corporation hold training programs in this field. The environmental societies also play an important role in awareness of the risk resulting from environmental pollution in general, including chemical pollution.

(9-4) Analysis

- The greater majority of the technical potentials and labs are limited purposes labs that serve the institution in which they exist. There is a dire need for the availability of accredited governmental labs to conduct chemical analysis that serves general purposes.
- There is always a need for modernizing and upgrading the existing labs and also to increase training programs specialized in modern lab equipment.
- Attention should be concentrated on chemical safety issues in the factories. Chambers of commerce have an important role to play in this domain.
- Exchanging information is an issue of paramount importance. Therefore, it is very important to have an information system for chemicals capable of meeting interested industrialists, academic

or control bodies in the Kingdom. The presence of information in the focal point in the Ministry of Health, Civil Defense Directorate and some other governmental agencies may not be sufficient in future if such information are not placed in a national information network, which is expected of the Jordanian integrated information system project for managing chemicals being implemented by the Royal Scientific Society in cooperation with the Ministry of Environment and other concerned bodies.

Chapter Ten

International Link

The aim of this chapter is to describe the national participation and its link with international organizations and conventions concerned about management of chemicals and to identify the opportunities for reaching an integrated approach for such management at the national level.

(10-1) Cooperation with international organizations and contributing to the conventions concluded therewith.

International conventions concerned with hazardous chemicals and materials, to which Jordan is a party.

Jordan has ratified several international conventions, which are directly related to chemicals, the most important of these are:

- 1- The 1998 Rotterdam Convention on the Prior Consent Procedure for Certain Hazardous Chemicals Pesticides (PIC) of 1998.
- 2- The Stockholm Convention on Persistent Organic Pollutants (POPs) of 2001.
- 3- The UN Convention on Fighting Illegitimate Drugs Trafficking and Mental Effects of 1988.
- 4- The 1993 Convention for Prohibition of Development, Production, Stockpiling, Transfer, Use and Destruction of Chemicals Weapons.
- 5- The Basel Convention on the Control of Trans-boundary Movements of Hazardous Wastes and their Disposal, 1998
- 6- The Vienna Convention and Montréal protocol on the Protection of Ozone.
- 7- The UNFCCC and the Kyoto Protocol emanating from the UNFCCC of 1989.
- 8- The Convention on the Protection against Marine Pollution by Disposing of Wastes and other materials.
- 9- The Protocol related to the International Convention on Eliminating Pollution caused by ships of 1978.
- 10- The 1972 Convention on the Prohibition of Development, Production, and Use of chemicals weapons of 1972.
- 11- The FAO Convention
- 12- The GATT on the imports of chemicals.
- 13- The convention on the safety of souls at sea of 1974.
- 14- Nuclear Nonproliferation Agreement NPPT.
- 15- Safety of Disposal of Consumed fuel and Radiant Wastes

The most important international conventions directly related to chemicals management

First: The 1998 Rotterdam Convention on the Prior Consent Procedure for Certain Hazardous Chemicals Pesticides (PIC) of 1998

The purpose:

The purpose of this convention is to encourage participation in responsibilities and cooperative efforts between the parties in international trade in certain hazardous chemicals for the protection of human health and the environment against possible hazards and contributing in its use in sound environment way by facilitating the exchange of information on these materials and preparing for the national decision – making process with respect to its import and export and circulate these decisions among the parties.

The authority concerned with the implementation of the convention:

The authority concerned with the implementation of the convention is the Ministry of Environment.

Second: The Stockholm Convention on Persistent Organic Pollutants (POPs) of 2001

The purpose: the purpose of this convention is to protect human health against persistent organic pollutants.

The authority concerned with the implementation of the convention:

The authority concerned with the implementation of the convention is the Ministry of Environment.

Third: The UN Convention on Fighting Illegitimate Drugs Trafficking and Mental Effects of 1988

The purpose:

The purpose of this convention is to establish cooperation between the parties to be able to effectively confront different forms of illegal trafficking of drugs and mental effects of international dimension. The convention stipulated that the parties should take necessary measures to meet their obligations under the convention, including legislative and administrative arrangements in accordance with its basic legislative bylaws.

Authorities concerned with the implementation of the Convention:

- Customs Dept.
- Ministry of Interior
- Anti-Drug Dept.
- Ministry of Interior / Public Security Directorate
- Ministry of Finance – Central Bank (for controlling the movement of revenues and funds generated from trade).

Fourth: The 1993 Convention for Prohibition of Development, Production, Stockpiling, Transfer, Use and Destruction of Chemicals Weapons

The purpose:

The purpose of this convention is to prevent the parties to the convention from producing, possessing, stockpiling, and transporting chemical weapons directly or indirectly to any other place. Jordan has ratified this convention with the issue of Royal Decree approving the resolution of the Cabinet No. (1172) dated 12/8/1997 for Jordan accession to the convention of the prohibition of chemical weapons which came into effect on 29/9/1997.

Fifth: The Basel Convention on the Conduct of Trans-boundary Movements of Hazardous Wastes and their Disposal, 1998

The purpose:

The purpose of this convention is to control the transboundary movement of the hazardous wastes and their disposal. These wastes are:

- Wastes belonging to any category stated in the first annex of the convention, except if they are not characterized by any of the characteristics mentioned in Annex (3) thereof.
- Wastes that are not covered by clause one but are known or perceived by local legislation of the export, import or transit party as hazardous wastes.
- Wastes belonging to any category stated in clause two and are subject to transboundary.

The authority concerned with the implementation of this convention
The authority concerned with the implementation of this convention is the Ministry of Environment

Other Conventions:

Jordan did not ratify any convention issued by the International Labor Organization (ILO) directly related to chemicals. However, in 1965 it

ratified the convention No. 120 of 1964 on the health rules in trade and offices. Article 17 thereof indicates that "appropriate and practical measures shall be taken to protect workers against hazardous non-hygienic or poisonous materials, processes and techniques".

Moreover, in 1963 Jordan ratified convention No. (81) of 1947 on the inspection of work in industry and trade, Article (9) of which indicates that necessary measures must be taken to ensure the protection for and safety of workers and to discuss the effects of operations, materials and work methods on them. Under this convention, labor inspectors are entitled to take samples of the materials used in production for analysis purposes.

Tables (10-1) and (10-2) shed light on Jordan's participation in international activities and conventions and acquaint local entities linked with different international bodies with such activities.

(10-2) Participation in technical support projects related to chemicals.

Table 10-3 shows the bilateral and /or multilateral cooperation programs which one being carried out or to be carried out in future in order to obtain technical support in the fields of management of chemicals. It also gives an overview on all activities related to chemicals management between the concerned parties and the projects related to the environment and sustainable development.

Table 10-1: Jordan membership in International Organizations and Programs.

International Organization/Activity	National contact point	Other Ministries involved & depts.	Related national Activities
IFCS- Intergovernmental Forum on Chemical Safety	Ministry of Environment	Ministry of Health, Ministry of Agriculture, & Public Security	Chemicals management
UNEP	Ministry of Environment	Ministry of Health, Universities, Royal Scientific Society (RSS) & Public Security	Preservation of the environment
GEF/UNEP	Ministry of Planning	Ministry of Environment	Persistent organic compounds management.
IRPTC	Ministry of Health, Ministry of Agriculture	Ministry of Environment, Customs Dept., Ministry of Agriculture, Ministry of Environment	Chemicals management

IPCS	Ministry of Health	RSS and Civil Defense	Chemicals management
WHO	Ministry of Health	Ministry of Agriculture, Universities, RSS, Public Security & civil defense	Preserve Citizens' health and provide them with health care
FAO	Ministry of Agriculture	Ministry of Health & Institute of Standards and Metrology	Food safety and specifications
ILO	Ministry of Labor	Ministry of Health & Social Security Corp.	Organize and enlighten workers
The World Bank	Ministry of Planning	All Ministries	Development projects support loans
European Common Market	Ministry of Planning	All Ministries	Development of trade and political and cultural relations
IMO	Ports Authority	Ministry of Transport	Maintenance of marine transport safety and marine environment
IAEA	Jordanian Atomic Energy Commission	Ministry of Agriculture, RSS, Universities, Civil Defense and private sector	<ul style="list-style-type: none"> - Aid projects comprising experts, training and equipment - Nuclear weapons nonproliferation - Organization of materials transport operations
International Safety Program IPCS	Chemical Weapons Banning Organization	Ministry of Interior and all Ministries and institutions.	Ban of chemicals used in manufacturing chemical weapons
European Environment Statistical Office	General Statistics Dept	General Statistics Dept	Providing aids to carry out statistical surveys including chemicals
Desertification Agreement	Ministry of Environment	Ministry of Health, Ministry of Agriculture, Universities & RSS	Prevent desertification
Bilateral Cooperation Agreement with Tunisia	Ministry of Environment	Ministry of Rural Affairs	Wastes dumping site
Bilateral Cooperation Agreements with Syria and Lebanon	Ministry of Transport	Ministry of Environment Civil Defense	Transport of hazardous materials.

Table 10-2: Jordan Participation in International Agreements Related to Chemicals Management

International Agreements	Responsible Agency	Relevant National Activity
Agenda 21	Ministry of environment	Drawing up of national environment agenda
Montreal Protocol	Ministry of Environment	Ozone layer depleting materials
ILO Agreement No. 170	Ministry of Labor	
Basel Convention	Ministry of Environment	Management and trans boundary hazardous wastes
Rotterdam Convention	Ministry of Health, Ministry of Agriculture	Determination of national measures on the prior Informed consent procedures for certain hazardous chemicals and pesticides.
Stockholm Convention	Ministry of Environment	Identification of sources and quantities of persistence organic materials
GATT/WTO Agreement (related to chemicals trade)	Ministry of Industry & Trade	Simplifying international measures and control
Convention on prohibition chemicals weapons	General Headquarter of Jordan Armed Forces	
SOLAS 1974 Agreement	Ports Authority, Jordan	Marine transport Marine Authority
MAPRPOL 1973/1978	Ports Authority	Marine transport
Nuclear Arms non-Proliferation Convention	General Headquarters of Jordan Armed Forces	
Vienna Agreement on Civil Liability for Nuclear damages	Ministry of Foreign Affairs, Jordan Atomic Energy Commission, Ministry of Eenvironment	
Agreement on safe disposal of consumed fuel and Radioactive wastes	Ministry of Foreign Affairs, Atomic Energy Commission, Ministry of Environment	
UNFCCC	Ministry of Environment	Restricting and reducing emission of green houses gases
The Koyoto Protocol on Climate Changes	Ministry of Environment	Restricting and reducing emissions of green houses gases.

Table 10-3: Jordan's Participation in the Technical Support Projects

Name of Project	Int'l/donor	National Contact point	National Activity
Bi-lateral Environmental Health Project including: - Chemical Safety Enhancement - Assessment & Management of Environmental Health Program - Water Supply	WHO	Ministry of Health/Environmental Health Directorate	<ul style="list-style-type: none"> - Staff Training - Equipment Supply - Field Surveys - Implementing Applied Scientific Studies
Agenda 21	UNDP	Ministry of Environment	- Foreseeable Environment Strategy
Aqaba Gulf Protection Project from Pollution	World Bank	ASEZA	Enhancement of anti-marine pollution measures in Aqaba Gulf
Use of Substitutes for ozone depleting materials	Montreal Fund	Ministry of Environment	Replacement of ozone-depleting materials in Jordan Industries
Halloons Banks	World Bank Montreal Fund	Jordanian Force and Royal Maintenance Corp.	Recycling available halons available in the local market and provide strategic stock for the armed forces and the most important institutions in the Kingdom
Organic Solvents	World Bank Montreal Fund	Ministry of Environment and National Hallons co.	Replacing solvents that harm ozone layer which is used in maint. Operations
Conditioning and cooling fluids	World Bank Montreal Fund	Armed Forces/ Directorate of military production	Replacing conditioning and cooling fluids that harm the ozone layer
Climate Change Project	UNDP	Ministry of Environment	Identify green house gases
Gradual Disposal of Bromide – Methyl Gas Project	German Government	Ministry of Agriculture	Gradual disposal of bromide methyl gas under which Jordan undertakes not to use any quantity thereof in 2005
Wastes Disposal project	Special Budget	Ministry of Environment Greater Amman Municipality	The Ministry assumes part of the budget of these projects such as providing of a building, staff and offices
Dioxine and furan emissions inventory project	UNEP chemicals	Ministry of Environment	Assessment of dioxine and furan emissions from different possible sources in the Kingdom

POPs project and implementation of Stockholm convention	UNEP	Ministry of Environment	Preparation of a national plan for implementing the Stockholm convention on POPs
Hazardous wastes integrated Management project	Swiss Government	RSS Ministry of Environment	Set up of an integrated information system for hazardous wastes and link concerned agencies therewith
Chemical wastes and materials sustainable and integrated program project	UNITAR	Ministry of Environment	Development of the strategies, information and legislations and capacity building related to chemical materials and wastes.

It is noted that there is no sound mechanism for cooperation between the various international aid programs of foreign technical aids to Jordan, which sometime lead to duplication of activity, and waste of effort. Therefore, it is imperative to find a mechanism of cooperation between the supporting international parties.

(10-3) Analysis

- Many support programs outputs come in the form of studies and reports without there being any mechanism for supporting the actual implementation of such outputs.
- Despite the limited available potentials, Jordan is keen to join all international agreements concerned with chemical safety, implement its provisions and participate in the international forums in this respect.
- Generally, there are points of weakness in the implementation of certain signed agreements, because of shortage of qualified manpower, to deal properly with the texts of these agreements and lack of technical and financial potential's to achieve it.
- There is a dire need to upgrade and enhance the capabilities of the working cadres in this field under the supervision of supporting bodies to ensure success of the programs in question. There is also a need for national clear-cut measures and practical steps for the implementation of programs and concluded agreements
- Lack of national integrated strategy for chemicals management, and consequently identifying Jordan's priorities in this field, which will ultimately lead to weak linkage between the national capabilities and international programs as well as weakness in coordination and cooperation between the official concerned parties to apply these projects and agreements as required.

Chapter Eleven

Awareness of Worker and the Public

This chapter aims to provide an overview of the mechanisms available for providing information to workers and the public concerning the potential risks associated with the production, import, handling, use and disposal of chemicals.

There are many institutions and parties operating in the field of providing workers and the public with information, launching awareness campaigns aimed at the health protection from various chemical hazards. These parties are:

Ministry of Environment

The Ministry of Environment plays an important role in the field of general awareness of the risks of environmental pollution, including handling wastes and chemicals improperly. The Ministry includes within its organization structure, a specialized directorate for media and awareness. Other technical directorates in the Ministry play important roles in awareness commensurate with the nature of their work.

Media and Awareness Directorate

The Media and Awareness Directorate coordinates and prepares different awareness programs and activities that take several forms, including the following, for example: holding workshop and seminars, giving lectures, printing brochures and posters and arranging press interviews and conducting environmental contests....etc.

Chemicals and Wastes Management Directorate

The directorate shall prepare scientific materials related to chemical and hazardous material and wastes. Technicians of the Directorate shall take part in delivering specialized lectures on how to manage these materials, encourage recycling processes and benefit from wastes decomposition processes for production of biogas.

Environment Effect Assessment Directorate

The Directorate performs out its awareness role by inviting those interested in and influenced by various projects, to participate in debate and consultative seminars that precede the commencement of any project for which a study shall be conducted to assess the environmental effect. The Directorate shall also prepare a directive manual on the process of environmental effect assessment for different sectors such as industrial sector that embodies chemical industries

Air Protection Directorate

Air Protection Directorate performs its role in enlightenment of the risks of the emissions of vapors of chemicals and gases resulting from industries and transportation means. In this regard, it had launched enlightenment campaigns to vehicles' drivers in cooperation with the Traffic Department with the aim to maintain their vehicles and limit the emissions of exhaust gases.

Water Protection Directorate

Enlightenment efforts at the Water Protection Directorate concentrate on industrial sectors which produce industrial wastewater with the aim to limit the quantities of such wastewaters and encourage water recycling in industrial installations.

Projects

A project or agreement being implemented at the Ministry of Environment is hardly devoid of any of the awareness activities aspects, whether the targeted party is certain in sector or the public. The following are examples of the projects and agreements related to chemicals:

- Project of construction and management of treatment, storage, disposal of hazardous wastes in Suwaqa area.
- Persistence organic pollutants project in accordance with the Stockholm convention. Project on replacing for the ozone depletion materials in accordance with the Vienna convention and Montreal Protocol.
- Climate change project under UNFCCC and the Kyoto Protocol.
- The Basel Convention on the Control of Transboundary Movement of Hazardous Wastes.
- The Rotterdam Convention.

Ministry of Health

The Ministry of Health plays a vital role in the education and awareness field on the risks of chemicals through its various directorates. The most important of these directorates are the following:

Health Education Department

Objective:

Enlighten and convince the citizens to change their attitude and behavior in order to safeguard themselves from chemical hazards. The health education department and the healthy safety directorate in all governorates carry out the following activities:

- Collection of information through qualitative and quantitative studies, to identify the size and causes of problems encountered by the targeted categories.
- Hold workshops and seminars to train the awareness programs executors in all health directorates for the concerned categories and decision makers.
- Hold organized and well- planned campaigns based on field studies on the targeted public through schools, factories professional establishments and voluntary societies etc.
- Produce illustrative aids such as leaflets, posters, films and the like.
- Follow up and evaluate the implemented activities and programs and reprogram it every year.

* The scientific material used in implementation prepared by the Environment Heath Directorate and Occupational Health Directorate

Occupational Health Directorate

The role of the department can be summarized in enlightening and educating workers through field visits to productive establishments in all parts of the Kingdom, defining risks, which worker encounter through the industrial process, enlighten workers of the risks of chemicals they handle and protection methods, the importance of using personal protection equipment during work, distribution of illustrative and educational leaflets and posters on work risks and protection methods, hold training courses in occupational heath field and participate in the courses and workshops related to the risks, which chemicals cause to health.

Environment Health Directorate/ Chemical Safety Division

The role of this division starts upon the importation of chemicals where the conditions to be met in the chemicals shall be attached to the import applications which include information on the general properties of these materials, health, risks, fire fighting, first aid, measures to be adopted in case of leakage, and spillage personal protection equipment and sound storage method in order to enlighten the importer and dealer with hazardous chemicals of the hazards of such items.

The awareness and education campaigns are done through:

- Holding seminars, lectures, and workshops related to chemical safety.
- Take part in the occasions and International Days related to chemicals such as the World Heath Day, Civil Defense World Day, fighting drugs trafficking.
- Make directive posters for laboratories.
- Publish educational articles in Jordanian Dailies.
- Participate in media programs through TV, targeting housewives to orientate them of the hazards of domestic material.

- Participate in lectures and courses related to chemical safety, jointly with other various government and non-governmental bodies.
- Participate with the Ministry of Education in the courses prepared for lab technicians.
- Provide the interested parties with information on chemicals and methods of handling.
- Issue national guidelines for safe handling of chemicals used in school labs.

Civil Defense Directorate

Personal Prevention and Protection Department

The Civil Defense Directorate shares in the enlightenment and education through cementing of the productive enlightenment concepts, drawing-up special framework in all life aspects, particularly with respect to preventive information to limit accidents by preventing its causes and limiting its dangers when it occurs, targeting all segments of the society. This is achieved through the formulation of an ambitious comprehensive plan that depends on illustrating the causes of previous accidents and investigates these reasons by the following methods:

- Prepare TV programs, radio and press reports, which show the effects of chemical accidents in general, and the resultant material damages, human losses and environment pollution.
- Make posters expressing chemicals risks and means of precautions.
- Publish the Civil Defense magazine.
- Issue a preventive directory on pesticides.
- Conduct First Aid courses for workers in the chemical field by the Civil Defense Centers in the various governorates.
- Participate in seminars and courses related to chemical safety with other governmental and non-governmental bodies and institutions.

Ministry of Agriculture

It plays an effective role in the enlightenment and education field against dangers of chemicals used in the agricultural field, most important of which are pesticides and fertilizers. The enlightenment and education are carried out through the following:

- Agriculture Guidance & Information Directorate, which includes the Directive Programs Department, manned by specialists in chemicals. This Directorate offers multi-dimensional guidance programs such as enlightenment of hazardous chemicals like pesticides and chemical fertilizers.
- Formulate a Law for recording directives on the dangers of pesticides on the insecticide packages.
- Prepare annual programs in the field of educational counseling.

- Participate in seminars and lectures together with other governmental and non-governmental institutions specialized in pesticides, fertilizers and the safe methods in handling it.
- Enlighten the farmers and the public on the use of the integrated fighting program.
- Cooperate and coordinate with local mass media (audio and visual), through TV, radio, articles and press reportage educational programs.

Vocational Training Corporation

Safety & Occupational Health Institute

It has an active and effective role to play in the service of industrial companies and corporations for the purpose of upgrading the safety level therein including chemical safety. This role can be summarized as follows:

- Hold special courses on safety and occupational health including courses on chemical safety in order to grant the safety supervisors a diploma to upgrade their efficiency
- Provide necessary information on chemical hazards through compact laser disks (CD).
- Participate in courses, seminars and lectures related to chemical safety in cooperation with the governmental and non-governmental bodies.
- Prepare photographic documentary films, which show work injuries, chemicals hazards and how to avoid them, the personal protection equipment needed during work and matters related to public safety.
- Conduct an assessment of work environment and specify level of chemical pollutants in the work environment to ensure that they are within the permissible limits.

Specialized Training Institute for Chemical Industries (STICI):

The Vocational Training Corporation has established the STICI for the purpose of providing trained manpower to an important promising sector in Jordan, that is Chemical Industries,. Its aims to provide the training services and specialized technical consultations in chemical industries field in the best quality.

The main functions of the institute can be summarized as follows:

- 1- Prepare the manpower for the basic work levels (limited skills, skilled, occupational) according to the technical skill scale of chemical industries professions adopted in Jordan.
- 2- Upgrade the specialized technical efficiency of workers in the chemical industry professions in Jordan's labor market.

- 3- Provide developmental technical consultancy services for the projects and companies of chemical industries sector, particularly the small and medium size ones.
- 4- Hold tests for determining the professional level of workers in the chemical industries professions in order to classify them according to the provisions of the Law of regulating the occupational work.

A technically qualified, specialized experienced staff is working in the institute and seeks outside expertise in order to develop and implement the institute's training programs. An agreement was signed between the Training Center for chemical Industries of the French AFPA Organization and the Institute for developing the technical capabilities of the institute's workers.

The institute offers training programs of different levels:

- Preparation program for the occupational level.
- Technical capability upgrading programs.
- Technical capability upgrading within the same level.
- Technical capability upgrading to a higher level.

The following specialized trainings are available in the Institute:

- 1- Plastic products industry.
- 2- Detergents industries.
- 3- Paints industries
- 4- Water treatment
- 5- Mining.

Amman Chamber of Industry

The Amman Chamber of Industry-through the Environment Department which was established in 1991 – offers technical consultation to the industry and for solving the environmental problems facing it, including the management of chemicals .

It is also working on enhancing the connection point between industry and governmental and non-governmental bodies concerned with the environment. In addition, it notifies factories with laws, instructions, and new standard specifications, which are issued by those bodies. Amman Chamber of Industry is an active member in the Jordanian program for cleaner production.

Ministry of Education

The Ministry of Education plays an active role in the enlightenment field of chemical hazards through the curricula and school textbooks Department and management of Queen Rania Center learning sources center division, which technically supervise all 12 learning sources centers which are distributed in the governorates.

The Directorate of Curricula and School Textbooks plays significant role in the enlightenment of students and teachers of the hazards of chemicals used in school labs, Such enlightenment was clear in the directories of practical experiments conducted on various scientific subjects as well as in the various science textbooks and teachers directories because there are prominent titles which are concerned of and call for observance of chemical public safety rules and the method of handling chemicals.

The school labs division in curricula and school textbooks department contributed in enlightenment of the hazards of chemicals. In this respect, It cooperate, on this aspect, with the division of learning resources at Queen Rania Center through the learning resources center distributed in the governorates. Whose role is as follows:

- Prepare of poster and cards that contain the most important information on every chemical material, affixing them on their respective packages and keep a list of such information for reference when necessary.
- Prepare guidance and warning boards illustrating the hazards of chemicals for distribution on school labs.
- Issue manuals for sound handling of chemicals used at the school labs, such as:
 - 1- Chemistry lab manual.
 - 2- Risks manual (instructions and warnings from chemicals)
- Hold courses and practical workshops for lab technicians on chemicals' hazards and proper methods of dealing herewith.
- Visit schools and supervise school labs, enlighten teachers and lab technician of the importance of providing the security and safety requirements inside the lab and during lab work.
- Prepare educational information programs related to the hazards of chemicals and chemical safety.
- Study extra curricula books dealing with chemicals and chemical safety issues in the labs, and recommended possessing them at schools.
- Provide technical consultation for schools and educational institutions regarding management of chemicals.
- Prepare and distribute illustrative scientific brochures related to chemicals' hazards.
- Deal with chemicals in terms of using and deposing of wastes.
- Supervise destruction of hazardous chemicals in school labs.
- Prepare electronic leaflets about managing chemicals through the Queen Rania Center website.

Aqaba Special Economic Zone Authority

The authority contributes to awareness and education by the following:

- 1- Hold workshops in cooperation with Jordan Bromine Company to identify the dangers of Bromine and how to deal with it in different accidents and the rest of materials belonging to the company in Aqaba.
- 2- Hold special workshops for the emergency plan for Ammonia in the industrial complex in Aqaba.
- 3- Host and support the fourth International Conference on hazardous materials.
- 4- Host and support the Arab Convention for environmental media.
- 5- Hold meetings with shipping agents and clearance companies to enlighten them of the importance of using Cas No. and the importance of correct identification of imported and exported chemicals.
- 6- Hold courses and meeting for knowledge exchange in addition to effective of participation in conferences and workshops related to chemicals

Non - Governmental Societies

The non-governmental societies play a distinguished role in the enlightenment. Its role is almost concentrated on this sector. The role of these societies increases by joining of thousands of members from different classes of society, in addition to the ordinary roles in spreading awareness in different social circles such as conducting workshops, delivering lectures and drafting articles spreading ...etc. It spreads the awareness by other methods like:

- Forming environmental clubs in schools.
- Performing environmental plays
- Establishing environmental camps, campaigns and marches.
- Forming pressing forces towards solving some environmental problems.
- Allowing the local community to take part in some wastes recycling and chemical protection.

The most famous societies in this respect is the Jordanian Environment Society. There are other societies that contribute to awareness efforts such as: Environment Friends Society, Consumer Lobbying Groups Society, Jordanian Society for Fighting Smoking ...etc.

Chapter Twelve

Recourses Available and Required for in the Management of Chemicals

(12-1) Resources available for management of chemicals

Table (12-1) shows the resources available for management of chemicals in a number of ministries and institutions concerned with management of chemicals.

Table (12-1) Resources available in ministries and institutions

No.	Ministry/ Institution/ Directorate concerned with management of chemicals	Qualified cadre		
		Specialization	No.	Academic Degree
1	Ministry of Health - Environment Health Dept.	Environmental Engineering	1	M.Sc.
		Chemical Engineering	8	B.Sc.
		Agricultural Engineering	3	M.Sc.
		Agricultural Engineering	1	B.Sc.
		Hydrological Engineering	1	B.Sc.
		Chemist	6	B.Sc.
		Public Health Technician	4	B.Sc.
		Environmental Technician	1	B.Sc.
		Environmental Technician	1	M.Sc.
		Labs Technician	1	B.Sc.
		Labs Technician Assistant	6	Diploma
		Health Controller	8	Diploma
2	Ministry of Environment - Directorate of Wastes and Chemicals Management	Chemical Engineering	1	Ph.D.
		Chemical Engineering	3	B.Sc.
		Environmental Engineering	1	Ph.D
		Environmental Engineering	2	M.Sc.
		Civil Engineering	1	B.Sc.
		Chemistry	1	B.Sc.
		Biology	1	B.Sc.
	- Directorate of Evaluating the Environmental Effect	Environmental Engineering	1	M.Sc
		Environmental Engineering	1	B.Sc.
		Chemical Engineering	2	B.Sc.
		Veterinary	1	B.Sc.
		Environmental studies	1	B.Sc.
		Applied mathematic	1	B.Sc.
		Secondary	1	B.Sc.
	- Directorate of Water Protection	Chemical Engineering	1	M.Sc
		Chemical Engineering	2	B.Sc.
		Environmental Engineering	2	M.Sc.
		Civil Engineering	1	B.Sc.

	- Directorate of Air Protection	Industrial Engineering Industrial Engineering Chemical Engineering Nuclear Physics Water and Environment	1 1 1 1 1	M.Sc B.Sc. B.Sc. Higher Diploma B.Sc.
3	Ministry of Agriculture	Agricultural Engineering Agricultural Engineering Agricultural Engineering Agricultural Engineering Chemistry Biology Natural Sciences Natural Sciences Natural Sciences Lab Technical	1 54 4 28 8 4 14 1 6 21	Ph.D. M.Sc. B.Sc. Diploma B.Sc. B.Sc. Ph.D. M.Sc B.Sc. Diploma
4	General Statistics Department -Environment Statistics Section	Agricultural Engineering Agricultural Engineering Geological Engineering Biology Statistician	1 2 1 1 1	M.Sc. B.Sc. B.Sc. B.Sc. B.Sc.
5	Ministry of Industry and Trade -Industrial Development Directorate	Civil Engineering Chemical Engineering Chemical Engineering Industrial Engineering Industrial Engineering Electrical Engineering Agricultural Engineering	1 1 5 1 6 1 2	Ph.D. M.Sc. B.Sc. M.Sc. B.Sc. B.Sc. B.Sc.
6	Ministry of Water and Irrigation	Chemical Engineering Chemistry Geology Microbiology Biology Technical lab assistant	12 6 1 1 1 61	B.Sc. B.Sc. B.Sc. B.Sc. B.Sc. Diploma
7	Ministry of Energy and Mineral Resources - Industrial Energy	Chemical Engineering Mechanical Engineering Electrical Engineering Petroleum Engineering Geology Economy Accounting	2 4 2 2 1 1 2	B.Sc. B.Sc. M.Sc. B.Sc. M.Sc. M.Sc. B.Sc.
	- Energy and Environment Department	Chemical Engineering Chemical Engineering	1 1	M.Sc. B.Sc.

	Jordanian Atomic Energy Commission	Nuclear Engineering Nuclear Engineering Nuclear Engineering Chemical Engineering Electrical Engineering Mechanical Engineering Civil Engineering Physics Physics Medical Physics Chemistry Mechanic Electro Mechanic Electrician Chemical Technician Assistant	2 2 2 1 2 1 1 5 5 7 1 1 3 4 2	Ph.D. M.Sc. B.Sc. B.Sc. B.Sc. B.Sc. B.Sc. Ph.D. B.Sc. B.Sc. M.Sc. Diploma Diploma Diploma Diploma
8	Ministry of Finance			
	General Customs Department /Amman	Agricultural Engineering Chemistry Industrial Engineering Chemical Industries	2 2 1 1	B.Sc. B.Sc. B.Sc. Diploma
	General Customs Department Aqaba	Veterinary Medicine Chemical Engineering Chemist Chemical Industries	1 3 1 1	B.Sc. B.Sc. B.Sc. Diploma
9	Ministry of Labor - Safety & Occupational Health Directorate	Chemical Engineering Chemical Engineering Mechanical Engineering Electrical Engineering Safety Engineering Occupational Health Physician Agriculture Engineering	1 2 4 1 3 4 3	M.Sc. B.Sc. B.Sc. Ph.D. B.Sc. B.Sc. B.Sc.
10	Aqaba Special Economic Zone Authority (ASEZA)	Chemist Occupational Health Chemical Engineering Marine Law	1 1 1 1	M.Sc. M.Sc. B.Sc. M.Sc.
11	Greater Amman Municipality	Environmental Engineering Veterinary Medicine Agricultural Engineering Agriculture Chemistry	10 1 70 6 1	B.Sc. B.Sc. B.Sc. B.Sc. B.Sc.
12	Public Security Directorate - Chemical Analysis Dept., Labs and Criminal Evidence Directorate	Chemistry Chemistry Chemistry Chemical Engineering Poisons Pharmacy Medical Analyses	1 8 1 16 2 2 1	Ph.D. B.Sc. Diploma B.Sc. M.Sc. B.Sc. B.Sc.

13	Civil Defense Directorate	Chemical Engineering	17	B.Sc.
		Mechanical Engineering	18	B.Sc.
		Electrical Engineering	10	B.Sc.
		Civil Engineering	3	B.Sc.
		Fir Fighting Engineering	1	B.Sc.
		Safety Engineering	1	B.Sc.
		(Chemistry Physics, Biology)	36	B.Sc.
14	Free Zones Corporation*	Chemical Engineering	1	B.Sc.
		Chemical Engineer Assistant	14	Diploma
15	Industrial Estates Corporation			
	- King Abdullah II Estate / Sahab	Environmental Engineering	1	Ph.D.
		Agricultural Engineering	1	M.Sc.
		Civil Engineering	1	B.Sc.
		Chemistry	1	B.Sc.
		Biology	1	B.Sc.
		Lab Technician	2	Diploma
		Mechanical Engineering	1	B.Sc.
		Electrical Engineering	1	B.Sc.
	- Al Hasan Industrial Estate / Irbid	Chemical Engineering	1	B.Sc.
		Mechanical Engineering	1	B.Sc.
		Civil Engineering	1	B.Sc.
		Electrical Engineering	1	B.Sc.
		Lab Technician	1	Diploma
	- Al Hussein Bin Abdullah II Industrial Estate / Karak	Chemistry	2	B.Sc.
		Mechanical Engineering	1	B.Sc.
		Lab Technician	1	Diploma
	- Ma'an Industrial Estate	-	-	-
16	Amman Chamber of Industry	Chemical Engineering	1	B.Sc.
17	*Natural Resources Authority	Chemical Engineering	12	B.Sc.
		Geology Engineering	5	B.Sc.
		Geology	1	B.Sc.
		Chemistry	1	Ph.D.
		Chemistry	2	M.Sc.
		Lab Technician Assistant	39	Diploma
18	Ports Authority	Chemical Engineering	2	B.Sc.
		Chemical Controller	5	Diploma
19	Petroleum Refinery Lab*	Chemical Engineering	2	B.Sc.
		Chemist	1	M.Sc.
		Chemist	2	B.Sc.
		Chemical Technician	5	Diploma
		Chemical Technical Assistant	25	Secondary

20	Royal Scientific Society			
	- Environment Research Center	Chemical Engineering Chemical Engineering Chemical Engineering Environmental Engineering Environmental & Water Engineering Chemistry Chemistry Technical Chemist Assistant Microbiologists	3 1 6 2 9 5 6 2 1	Ph.D. M.Sc. B.Sc. Ph.D. M.Sc. M.Sc. B.Sc. Diploma Ph.D.
	- Industrial Chemical Department	Environmental Engineering Chemical Engineering Chemistry Chemistry Chemistry	1 3 3 4 10	Ph.D. B.Sc. Ph.D. M.Sc. B.Sc.

* Bodies in which information is not updated

(12-2) Training Resources Required for Chemicals Management

Table (12-2) shows the required training for chemicals management in a number of ministries and institutions concerned with chemicals

Table (12-2) Training requirements needed for chemicals management

No.	Ministry /Institution /Directorate Concerned with chemicals management	Training Requirements
1	Ministry of Health	<ul style="list-style-type: none"> - Medical Wastes Management <ul style="list-style-type: none"> • Implement medical wastes management operations. • Evaluate the efficiency of medical wastes management operations. - Air Quality Control <ul style="list-style-type: none"> • Design and implement ambient air quality control programs. • Use of mathematical patterns evaluate control program results. • Environmental health impact assessment of development projects. • Environmental inspection. • Risks Assessment. • Chemicals management. • Information management. • Identify the occupational dangers in work environment. - Occupational Health: <ul style="list-style-type: none"> • Environment inspection in internal work environment. • Evaluate occupational danger in work environment.
2	Ministry of Environment	<ul style="list-style-type: none"> - Prepare project and feasibility studies. - Environmental economy. - Residuals recycling and cleaner production. - Information management and international cooperation. - Use of mathematical models to estimate the quantity and directions of pollutants. - Evaluate Environmental hazards. - Environmental inspection and control. - Environmental planning. - Environmental disasters. - Manage medical wastes. -
3	Ministry of Agriculture	Agriculture guidance
4	Ministry of Labor	<ul style="list-style-type: none"> - Occupational diseases related to chemicals. - Workers protection from chemical Hazards. - Safety & occupational health management. - Measure and evaluate internal work environment.
5	Ministry of Industry & Trade	<ul style="list-style-type: none"> - Industrial wastes management (Solid and liquid). - Environmental inspection. - Environmental Impact assessment. - Chemicals management. - Environmental management.

6	Ministry of Water and Irrigation	<ul style="list-style-type: none"> - Environmental management system. - Wastewater plants design. - Drinking water purification and treatment. - Analysis of water and microorganism.
7	Royal Scientific Society	<ul style="list-style-type: none"> - Environmental management systems. - Environmental planning. - Wastewater treatment. - Public health procedure. - Seawater desalination. - Identify air pollution sources.
8	Ports Authority	<ul style="list-style-type: none"> - Treatment of leakages. - Safe handing of hazardous chemicals. - Management of hazardous material accidents.
9	Aqaba Special Economic Zone Authority	<ul style="list-style-type: none"> - Chemicals management and marine pollution. - Agreements related to chemicals. - Legal procedures and penalties taken for chemical marine pollution cases. - Wastes and chemicals management. - Dealing with and handling chemical accidents. - Emergency plans. - Software for chemical safety. - Requirements storage and identification labels of chemicals. - Industrial safety and risks management. - Concepts and methods of environment inspection development.
10	Municipality of Greater Amman	<ul style="list-style-type: none"> - Environmental impact assessment. - Solid wastes management. - Water analysis. - Environmental warnings.
11	Public Security Department	<ul style="list-style-type: none"> - Chemical analysis using. - Modern and advanced equipment.
12	Civil Defense	<ul style="list-style-type: none"> - Chemical accidents prevention methods. - Chemical accidents storage methods. - Chemical accidents treatment. - Personal protection equipment from chemicals.
13	Ministry of Planning	<ul style="list-style-type: none"> - Environment management evaluate economic environment plan. - Identify the effective environmental factors.
14	Industrial Estates Corporation	<ul style="list-style-type: none"> - Environmental management systems. - Evaluation of environment effects. - Environmental hazards. - Wastewater analysis.
15	General Statistics Department	<ul style="list-style-type: none"> - Environmental impact assessment. - Identification environmental problems.
16	Metrology Department*	<ul style="list-style-type: none"> - Weather changes - Operating measurement stations - Environmental hazards management
17	Jordan Institute for Specification and Metrology	<ul style="list-style-type: none"> - Environmental specifications
18	Environment Friends Society	<ul style="list-style-type: none"> - Environmental and health assessment. - General warnings of environment.

19	Armed Forces	<ul style="list-style-type: none"> - Hazardous Chemicals and Wastes Management To train management engaged in this field to develop programs for wastes management and public policies in this domain, to evaluate and review handling and dealing measures, to identify relevant international agreement, and examine experiments of others (No. 3) - Medical Wastes Management Handle different type of medical wastes and methods of disposal (No. 5) - Marine Pollution Handle oils, lubricants, hazardous material leakage (No. 5) - Occupational Safety and Health Identify chemical risks and sound methods for dealing therewith, and to develop necessary awareness programs (No. 15) - Safety Engineering Design, and evaluate safety and protection systems and equipment, safety specifications for installations, methods of minimizing chemical hazards, conduct HAZOP Studies and analyze and investigate chemical accidents (No. 5) - Chemical and lab Materials Management Sound and correct methods for the storage, handing and transport of chemical and lab materials and treat chemical wastes generated in gaseous, liquid and solid labs (No. 15)
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* Bodies in which information is not updated

(12-3) Analysis:

- Certain entities concerned with chemicals and management suffer from shortage of qualified cadre.
- The need for training is urgent in some aspects of chemicals and chemical wastes management, like:
 - Recycle residuals and cleaner production.
 - Environment risks assessment
 - Environmental planning
 - Chemical environmental crises
 - Medical wastes management
 - Chemicals management and marine pollution.
 - Industrial chemicals wastes (solid and liquid)