National Mini-Profile
for Sound Management of Chemicals

State Environmental Protection Administration

People's Republic of China

December, 1999

Preface

Chemicals, including pesticides, industrial chemicals and consumer chemicals, have become indispensable in many economic activities, and are increasingly used in the industrial, agricultural and consumer sectors of all societies. However, increasing evidence suggests that chemicals can contribute to health and environmental problems at various stages during their life cycles from production/import through disposal. Such problems include pollution generated during production processes, improper handling, storage and transport accidents, occupational accidents and diseases, and environmental contamination due to unsound disposal methods.

It is now widely recognized that chemicals need to be managed properly in order to achieve a sustainable level of agricultural and industrial development, and a high level of environmental and human health protection. One important step in strengthening national systems for the management of chemicals is a comprehensive assessment of the national infrastructure, relating to the legal, institutional, administrative and technical aspects of chemical management, along with an understanding of the nature and extent of chemicals' availability and use in the country.

To this end, the first meeting of the Inter-governmental Forum on Chemicals Safety (IFCS) held in Stockholm in 1994, when discussing Program Area E of Chapter 19 of Agenda 21, which deals with "Strengthening National Capabilities and Capacities for the Management of Chemicals," recommended that "national profiles to indicate current capabilities and capacities for the management of chemicals and the specific needs for improvement should be elaborated as soon as possible, and not later than 1997." Later, a Guidance Document was developed to assist countries in preparing national profiles to assess the national infrastructure for the management of chemicals. This Guidance Document was prepared by the United Nations Institute for Training and Research (UNITAR) under the umbrella of the Inter-Organization Program for the Sound Management of Chemicals (IOMC) and in close cooperation with the IFCS Secretariat.

The second Inter-session Group Meeting (ISG-2) of the IFCS, which was held in March 1996 in Canberra, Australia, reiterated the importance of National Profiles as a stepping stone to strengthening national capacities and capabilities for the sound management of chemicals. ISG-2 specifically invited countries to "commit themselves to the preparation of a mini or comprehensive National Profile, as national circumstances dictate, using the process in the revised UNITAR guidance document," and "report on progress on National Profile preparation to the 1997 Forum."

As one of the IFCS member states and a country which once held the post of IFCS Vice Chairman, China has actively participated in various activities concerning the sound management of chemicals. In 1996, the State Environmental Protection Administration (SEPA), together with related ministries, evaluated the technical requirements, amount of work and funds needed in preparing the national profile,

and had the UNITAR's Guidance Document translated into Chinese. China believes it to be an essential and most fundamental work in the country's management of chemicals to prepare such a national profile. It should be done properly, taking China' own interests and management system into account. Nevertheless, China is still in a period of economic transition, and weak in terms of social, economic, management and technical foundations. As the preparation of the national profile consumes a substantial amount of labor and funds, and involves various aspects of chemical management, China needs financial aid to start the preparation work. For this purpose, the SEPA reached an agreement with the UNITAR before starting the preparation of a Mini-Profile at the end of 1998. A preparation coordination group composed of departments in charge of environmental protection, agriculture, health, chemical industry, and economy and trade and a working group composed of technical support units under these departments were set up to carry out the task of preparing a Mini-Profile in a comprehensive way.

China is intensifying its environmentally friendly management of chemicals. The SEPA plans to formulate regulations concerning the environmental management of chemicals in the year 2000, and establish a complete chemicals environmental management system across the country during the coming five years. The Profile will play an active role in strengthening China's capability and capacity for the management of chemicals.

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Chapter 1: National Background Information

1.1 Territory

China's territory covers an area of 9.6 million kilometers, making it the third-largest country in the world after Russia and Canada. It makes up some one-fifteenth of the world's total land area and is about the size of Europe. China is located at the eastern end of the Asian continent and on the western shore of the Pacific Ocean. Such a geographical position has made it easy to develop relations with numerous neighboring countries as well as with various other countries. The humid air from the sea brings plentiful rainfall, which is the major source of China's freshwater resources and the essential condition for the development of agricultural production.

China has a vast stretch of territory. From north to south it measures about 5,500 kilometers, sprawling across 50 degrees of latitude, with the northernmost boundary being marked by the principal channel of navigation in the middle of the Heilongjiang River (near 53 degrees north latitude), to the north of a town named Mohe, and the extreme southern boundary being a group of submerged coral islands known as Zengmu (four degrees north latitude). From east to west, China stretches for more than 5,000 kilometers, straddling 62 degrees of longitude, with the eastern end located where the principal channels of navigation on the Heilongjiang River and the Ussuri River meet (135 degrees east longitude), and the western end on the Pamir Plateau in Xinjiang (73 degrees east longitude). China borders Korea in the east, Russia in the northeast, Mongolia in the north, Russia and Kazakhstan in the northwest, Kirghizstan, Tadzhikistan, Afghanistan and Pakistan in the west, India, Nepal, Sikkim and Bhutan in the southwest, and Myanmar, Laos and Vietnam in the south. China has a variety of landforms, with mountainous areas making up two-thirds of the total area. From a bird's eye view, the country looks like a series of descending terraces, trending downwards from the west to the east.

As China is situated in the Northern Hemisphere, and the Tropic of Cancer runs through its southern part, the major part of the country is in the north temperate zone, while the remaining small part is in the tropics. Its latitudinal position provides adequate sunshine and heat, and the large span from north to south is conducive to the growth of a large variety of animals and plants. Because of different distances from the sea, varying topography and varying trends of mountains, China has a marked monsoonal climate characterized by great variety. It is hot and rainy in summer and cold and dry in winter. The rainy season coincides with the hot season.

1.2 Natural Resources

China's land resources have a large absolute figure but a small per-capita

share. They are diversified in variety, but cultivated land makes up just a small proportion. Utilization of land is complex and the differences in the level of the productive forces between regions are obvious. The distribution of land resources is unbalanced between regions. The problem of protection and development are outstanding. Rivers and lakes are the major freshwater resources. The per capita amount of runoff in China is 2,200 cubic meters, 24.7 percent of the world's per capita amount of runoff. The distribution of water resources is unbalanced — more in the south and less in the north — while the distribution of cultivated land is just the opposite. Such a bad match between the water and farmland resources has intensified the shortage of water in the northern areas of the country. China has reserves of 680 million kilowatts of water energy resources, ranking first in the world. Such resources on the upper reaches of the Yangtze, Yellow and Pearl rivers have been well developed and utilized. China is also one of the countries with the greatest diversities of plants and animals.

China is rich in mineral resources. About 140 types of minerals have been proven to be of industrial mining value. China's proven reserves of tungsten, antimony, rare earth, molybdenum, vanadium and titanium are the largest in the world. China also leads the world in reserves of coal, iron, lead, zinc, copper, silver, mercury, tin, nickel, appetite and asbestos. But the distribution of these resources is unbalanced.

1.3 Administrative Divisions

China's Constitution provides that the administrative units are currently based on a three-level system, dividing the nation into provinces (including autonomous regions and municipalities directly under the Central Government), counties (including autonomous counties) and townships. A township is the grass-roots administrative unit. Currently, China is divided into 23 provinces, five autonomous regions, four municipalities directly under the Central Government, and two special administrative regions (Hong Kong and Macao). Beijing is the capital of China.

1.4 Population

China has the largest population in the world. A sample survey done by the National Bureau of Statistics shows that by the end of 1997, the total population of China had reached 1.23626 billion, or 1.243 billion when Hong Kong is included. The urban population stood at 369.89 million, accounting for 29.9 percent, while the rural population stood at 866.37 million, making up 70.1 percent. The national birth rate was 16.57 per thousand, the death rate 6.51 per thousand, and the natural growth rate of the population was 10.06 per thousand. The distribution of the Chinese population features great density in the eastern areas and a scanty population in the

west. With such a large population, China's resources are relatively insufficient. Moreover, development in different regions is not even, and the productive forces are underdeveloped.

China is a unified, multi-national country, with 56 ethnic groups. The Han people make up more than 90 percent of the total population, while the other 55 ethnic groups have sparse populations, and are therefore customarily referred to as the national minorities. The distribution of these ethnic groups is characterized by both living in exclusive compact communities and living together. China currently has five autonomous regions, 30 autonomous prefectures and 120 autonomous counties (in some cases they are known as banners). All these places have a total population of 164.08 million, accounting for 13.6 percent of the national total. Of this figure, 74.51 million are members of ethnic minorities, making up 45.4 percent. These places cover a total area of 6.137 million square kilometers, accounting for 63.9 percent of the national territory. Where national minorities live in compact communities, autonomous organs of self-government are established for the local people to exercise autonomous rights. All ethnic peoples have the freedom of using and developing their own spoken and written languages and the freedom of preserving or reforming their own traditions and customs.

1.5 State Organs

The People's Republic of China practices the people's congress system. Deputies to the people's congresses at all levels are elected, and are responsible to and accept supervision by the people. The National People's Congress (NPC) is the highest organ of State power. It exercises the highest State power in a unitary way. The NPC Standing Committee is the permanent organization of the highest organ of State power.

The people's courts are judicial organs of the State. China has established the Supreme People's Court, local people's court, military courts and other special courts.

China sets up the Supreme People's Procuratorate.

The Chinese People's Political Consultative Conference(CPPCC) is a patriotic united front organization of the Chinese people, and an important body of multi-party cooperation and political consultation under the leadership of the Communist Party of China (CPC).

The State Council, the Central People's Government, is the executive body of the highest organ of State power, and also the supreme State administrative body. It has under it 29 Ministries and Commissions:

Ministry of Foreign Affairs
Ministry of National Defense
State development Planning Commission
State Economic and Trade Commission

Ministry of Education
Ministry of Science and Technology
Commission of Science, Technology and Industry for National Defense
State Ethnic Affairs Commission
Ministry of Public Security
Ministry of State Security
Ministry of Supervision
Ministry of Civil Affairs
Ministry of Justice
Ministry of Finance
Ministry of Personnel
Ministry of Labor and Social Security
Ministry of land and Resources
Ministry of Construction
Ministry of Railways
Ministry of Communications
Ministry of Information Industry
Ministry of Water Resources
Ministry of Agriculture
Ministry of Foreign Trade and Economic Cooperation
Ministry of Culture
Ministry of Health
State Family Planning Commission
People's Bank of China
National Audit Office

Organizations directly under the State Council include:
General Administration of Customs
State Environmental Protection Administration
State Forestry Administration
State Bureau of Quality and Technical Supervision
State Drug Administration
State Administration of Taxation
General Administration of Civil Aviation of China
State Administration of Radio, Film and Television
State General Administration of Sports
National Bureau of Statistics
State Administration of Industry and Commerce

People's congresses have been set up in the provinces (autonomous regions and municipalities directly under the Central Government), counties (cities) and townships (towns), and people's governments have been set up at all levels.

1.6 Forms of Economy

China's economic status in the world has been greatly raised, with its economic growth rate ranking first and aggregate economic volume rising to seventh in the world. From 1993 to 1997, the economy grew at an average annual rate of 10.9 percent, 7.2 percentage points higher than the world annual economic growth rate — 8.7 percentage points higher than that of the developed countries, and 4.4 percentage points higher than that of other developing countries. Malaysia, Singapore, the Republic of Korea and Indonesia also attained rapid economic development during the same period. But China's growth rate is still 2.2 to 3.7 percentage points higher than theirs. In 1995, China's gross domestic product (GDP) overtook those of Canada, Spain and Brazil, to rank seventh in the world, accounting for 2.5 percent of the world's GDP and the equivalent of 12.9 percent of the GDP of the developing countries. In 1997, China's GDP registered 7,477.2 billion yuan, maintaining the position of seventh in the world.

China leads the world in the output of major industrial and agricultural products. The production of grain, cotton, rapeseed, meat, coal, cloth, cement and TV sets was first in the world from 1993 to 1996. Electricity generation rose to second from fourth place, sugar production ranked third or fourth, and the output of crude oil stayed in fifth place. In 1996, China's steel output topped 100 million tons for the first time, to reach 101.24 million tons, rising to first from the second position in the world. The total output value of agriculture, forestry, animal husbandry and fisheries amounted to 245.87 billion yuan in 1997, and the total industrial output value stood at 11,373.27 billion yuan. The steel output in 1997 rose to 108.94 million tons.

With respect to foreign economic relations, as the No. 7 economic power, the most populous country, No. 10 trading nation in the world, and the largest economic power among the developing countries, China has become increasingly more important in the global economy. China has a significant status in the commodity trade, international capital and international tourism markets. In 1997, its total import and export value was US$325 billion, coming 10th in global trade. At the end of 1997, China had foreign exchange reserves of US$143 billion, the second highest in the world. In 1997, foreign funds actually used in China totaled US$62 billion yuan, a 59.14 percent increase over 1993, and its income foreign exchange from tourism reached US$12.074 billion, eighth in the world.

From 1993 to 1997, Chinese residents' consumption level rose at an average annual growth rate of 7.6 percent. Food made up 48.6 percent and 56.3 percent of urban and rural residents' living expenditures, respectively. In terms of consumption structure, the Chinese people have began to move from a life of having enough to eat and wear to a comfortable standard of living. In 1996, every 100 urban households had 93.5 color TV sets and every 100 rural households had 88 TV sets, both surpassing the average world level. In terms of housing conditions, the average rural

per capita amount of living space was 21.7 square meters and the average urban per capita amount of living space was 8.5 square meters in 1996, equal to the average level of the developing countries.

Chapter 2: Chemical Production, Import, Export and Use

2.1 Chemical Production

The chemical industry is an important primary industrial sector of China's national economy. Construction during the past 50 years has resulted in a complete and independent chemical industrial system having a satisfactory variety and reaching a certain scale. Statistics show that China is able to produce more than 45,000 types of chemical products. The output of synthetic ammonia ranks first and that of plastics ranks second in the world. In 1998, the output of primary industrial chemicals was 54.5 million tons, that of chemical fertilizers was 65.49 million tons, that of chemical pesticides was 382,000 tons and that of organic industrial chemicals was 19.31 million tons. In 1997, there were a total of 29,102 petroleum and chemical industrial enterprises across the country, which employed 5.531 million people. The total output value of the chemical industry registered 564.07 billion yuan (at 1990 fixed prices).

2.2 Chemical Import and Export

In order to protect human health and the environment, China has rigidly followed related international agreements and treaties while handling imports and exports of chemicals, and developing normal trade with other countries and regions. The volume of chemicals import and export has increased on a year-by-year base, though the growth rate is small. Changes have also taken place in the category, quantity and volume of trade of imported or exported chemicals. China enjoys an important position in the international chemicals trade, and has established normal trade relations with numerous countries and regions in this respect. Table 2.1 compares the total volume of chemicals imports and exports and the overall national volume of imports and exports during the 1991-97 period. China has chemical trade relations with the following major countries and regions: The United States, Japan, the Republic of Korea, Taiwan, Hong Kong, Russia, Germany, Thailand, the Netherlands and Singapore.

2.3 Use of Chemicals

Chemicals produced in China are mainly for domestic use. Only a small part is exported. China imports a large amount of chemicals each year. The chemical industry sector arranged production according to market demand.

According to *Chinese Agricultural Statistical Data*, the national consumption of chemical fertilizers by farmland from 1995 to 1998 stood at 35.94 million tons,

38.29 million tons, 39.8 million tons and 40.85 million tons, respectively, while the consumption of pesticides during the same period was 1.087 million tons, 1.14 million tons, 1.195 million tons and 1.231 million tons, respectively.

Table 2.1 A Comparison Between the Total Volume of Chemicals Imports and Exports and the Overall National Volume of Imports and Exports During the 1991-97 Period (US$ billion)

Item	1991	1992	1993	1994	1995	1996	1997
National volume of imports and exports	135.7	165.53	195.7	236.62	280.85	289.9	321.56
Total volume of chemicals imports and exports	13.89	15.71	17.74	21.59	29.72	31.7	34.5
Proportion of chemicals imports and exports in the national volume %	10.2	9.5	9.1	9.1	10.6	11	10.6
National volume of imports	63.76	80.59	103.96	115.62	132.08	138.83	142.37
Total volume of chemicals imports	9.28	9.87	10.22	12.83	18.12	19.3	20.16
Proportion of chemicals imports in the national volume %	14.6	12.3	9.8	11.1	13.7	13.9	14.1
National volume of exports	71.91	84.94	91.74	121.01	148.77	151.07	182.79
Total volume of chemicals exports	4.61	5.84	7.52	8.76	11.6	12.4	14.34
Proportion of chemicals exports in the national volume %	6.4	6.9	8.2	7.2	7.8	8.2	7.8

2.4 Chemical Wastes

The State Environmental Protection Administration has adopted a registration system for industrial solid wastes in accordance with the Law of the People's Republic of China on the Prevention and Control of Environmental Pollution Caused

by Solid Wastes. Of the generated wastes, a considerable part is hazardous. The various types of hazardous wastes produced in 1996 amounted to 24.77 million tons, of which 10.89 million tons were utilized in a comprehensive way, 3.31 million tons were disposed of, 6.71 million tons were stored and 3.9 million tons were discharged.

Chapter 3: Priority Concerns Related to Chemical Production, Import, Export and Use

3.1 Priority Concerns Related to Chemical Production, Import, Export and Use

The chemical industry is one of the major industrial pollution sources. The major pollutants discharged by chemical industrial production include oil, sulfur, phenol, cyanide, mercury, chromium, lead, cadmium, organic phosphorous, organic chlorine, vinyl cyanide, aromatic amine, nitrobenzene and nitrogenous heterocyclic compound. These toxic and hazardous substances are seriously detrimental to both human beings and the environment. In China, the priority concern during chemical production, import, export and use is given to satisfying the demands of the national economy. Simultaneously, attention is paid to their pollution effect on the environment and the damage they do to human health, two major issues facing China today. The Chinese Government has formulated various laws, regulations, standards and policies to strengthen management over the production, transportation, storage, marketing, use, import and export of chemicals. Environmental protection agencies, and medical, health and epidemic-prevention bodies at various levels exercise supervision and monitoring of chemicals, make appraisals, tackle pollution, and prevent and treat health problems. The Toxic Substances Control Center of the Chinese Academy of Preventive Medical Science was established on April 23, 1999, and a national network concerned with this work is now taking shape. Table 3.1 lists problem areas, and Table 3.2 lists priority concerns related to chemicals.

3.2 Air Pollution

In China, air pollution is mainly caused by smoke, and the major pollutants are sulfur dioxide and smoke. The year 1997 witnessed a total emission of sulfur dioxide of 23.46 million tons. The annual mean value concentration of sulfur dioxide was in the range of 3□248 microgram/cubic meters, and the national mean value concentration was 66 microgram/cubic meters.

In 1997, the average annual pH value of rainfall nationwide was between 3.74 and 7.79. Acid rain pollution in central China and the southwestern regions was serious. Such pollution tended to spread in south China., while remaining serious in the Tumen and Qingdao areas in the north.

The annual mean value concentration of nitrogen oxide was in the range of 4□140 microgram/cubic meters, and the national mean value concentration was 45 microgram/cubic meters.

Table 3.1 Description of Problem Areas

Nature of problem	City/Region	Brief description of problem	Chemical(s)/Pollutant (s)
Air pollution	Cities	Emission from industrial and civil coal and oil burning; automobile tail gas, construction sites	Total suspended granules, sulfur dioxide, nitrogen oxide
Acid rain	South of the Yangtze River, east of the Qinghai-Tibet Plateau, and Sichuan Basin	84 cities across the country are under monitoring. In 43 of them the average annual pH value of rainfall is less than 5.6	Sulfur dioxide
Water pollution	Liaohe River, Haihe River, Huaihe River, Chaohu Lake, Dianchi Lake, Taihu Lake	Industrial and household waste water emits hazardous substances, eutrophia	Nitrogen, phosphorous, hypermanganate index, BOD
Industry	Factories	Fire, explosion and poisoning caused by violation of operating instructions, abuse or accident	Carbon monoxide, hydrothion, carbonyl chloride, chlorine, ammonia, dimethyl sulfate, arsenide, phosphide, nitrogen oxide, carbinol and etc.
Agriculture	Agricultural regions	Poisoning caused by violation of operating instructions, abuse, accident or lack of knowledge of right use, pesticide residues	Alkron parathion E605, methamidophos, Rogor, ingredient of dimethoate and methamidophos, dichlorphos, Azodrin, and phorate
Public health	Cities and rural areas	Misuse, abuse, food pollution	Medicines, pesticides, industrial chemicals
Storage and Transport	Storage and transport locations, on the way of transportation	Violation of operating instructions, equipment is backward or unable to meet requirements, traffic accidents	Acutely toxic chemicals, including cyanide, pesticides

The annual mean value concentration of total suspended granules was in the range of 32□741 microgram/cubic meters, and the national mean value concentration was 291 microgram/cubic meters. There are 67 cities in the country where such

concentration exceeded the State's second-class standard (200 microgram/cubic meters), making up 72 percent of the total number of cities.

Table 3.2 Priority Concerns Related to Chemicals

Nature of problem	Scale of problem	Level of concern	Ability to control problem	Availability of statistical data	Specific chemicals creating concern	Priority ranking
Air pollution	Regional	High	Medium	Sufficient	Total suspended granules, sulfur dioxide, nitrogen oxide	Severe
Pollution of inland waterways	Regional	High	Low	Sufficient	Hypermanganate index, BOD, nitrogen oxide	Severe
Marine pollution	Regional	Medium	Low	Insufficient	Inorganic nitrogen, inorganic phosphorous, petroleum	Second severe
Ground-water pollution	Regional	Medium	Low	Insufficient	Nitrogen fertilizer, heavy metals	Second most severe
Soil contamination	Regional	Medium	Low	Insufficient	Pesticides, heavy metals, agricultural plastics	Second most severe
Pesticide residues in food	Regional	High	Medium	Insufficient	Pesticides	Most severe
Drinking water contamination	Local	High	High	Sufficient	Heavy metals, organic pollutants	Most severe
Hazardous waste treatment/ disposal	Local	Medium	Medium	Insufficient		Second most severe

Nature of problem	Scale of problem	Level of concern	Ability to control problem	Availability of statistical data	Specific chemicals creating concern	Priority ranking
Occupational health: agriculture	Local	High	Medium	Sufficient	Alkron parathion E605, methamidophos, Rogor, ingredient of dimethoate and methamidophos, furadan dichlorphos, Azodrin and phorate	Most severe
Occupational health: industrial	Local	High	High	Sufficient	Carbon monoxide, hydrothion, chlorine, ammonia, dimethyl sulfate, arsenide, phosphide, nitrogen oxide and carbinol	Most severe
Public health	Regional	High	Medium	Insufficient	Medicine, pesticides, carbon monoxide, carbinol, nitrite	Most severe
Chemical accidents: industrial	Local	High	Medium	Sufficient	Inflammable and explosive chemicals	Second severe
Chemical accidents: transport	Local	High	Medium	Sufficient	Ammonia, phosphide, methylamine, cyanide	Second severe
Unknown chemical imports	Local	Low	Low	Insufficient		Second most severe
Storage/ disposal of obsolete chemicals	Local	Low	Low	Insufficient		Second most severe

Nature of problem	Scale of problem	Level of concern	Ability to control problem	Availability of statistical data	Specific chemicals creating concern	Priority ranking
Persistent organic pollutants	Local	High	Medium	Insufficient	Polychlorinated biphenyl, dioxins	Severe

The Chinese Government pays great attention to air pollution, and has adopted some positive and effective measures to improve the quality of the atmospheric environment.

By the year 2000, all industrial pollution sources which discharge sulfur dioxide should meet the standard fixed by the State and should be subject to total discharge control. The State forbids the establishment of new coal mines where the sulfur content of the coal is more than three percent. The existing mines where the sulfur content is more than three percent shall limit production or be closed gradually. For new mines and the improvement of the existing mines where the sulfur content is more than 1.5 percent, coal washing and dressing facilities of corresponding scales must be installed. The existing mines where coal washing and dressing facilities are unavailable are required to build these facilities by stages, in accordance with State plans. The sulfur content of fuel coal and heavy fuel oil used in cities must comply with the prescribed standard of local governments. Except the heat and power plants where the electricity generation is determined by the heat generation capacity, no new coal-burning power plants may be built in the urban areas or on the outskirts of large and medium-sized cities. To build a new or transform an existing power plant where the sulfur content of burning coal is higher than one percent, desulfurization facilities must be provided. The existing power plants in this category were required to adopt measures to reduce the emission of sulfur dioxide before 2000 and to build desulfurization facilities or adopt other sulfur dioxide emission reduction measures of corresponding effect by stages before 2010. Chemical industry, metallurgy, building materials and non-ferrous metals enterprises which cause serious pollution must install technological waste gas treatment equipment or adopt other emission-reduction measures. While readjusting their industrial and product structure, these enterprises must make efforts to spread clean production, enhance technological transformation, promote the saving and comprehensive utilization of resources, and reduce the emission of sulfur dioxide. The marketing and use of sulfur coal have been restricted in some cities.

Enterprises producing arsenic, mercury, lead or tin, or refining oil by indigenous methods have been closed down.

Between 1995-97 period, the annual average value of CFCS production was 44,932 (ODP) tons while the annual average value of CFCS consumption was 55,751 (ODP) tons. In accordance with the Montreal Protocol (amended in London), China began to freeze and cut down CFCS production and consumption on July 1, 1999. By

the end of May 2000, the Chinese Government had formulated and put into effect 32 policies for protecting the ozonosphere. Legislation is now available for practicing a quota system on the production and import of ozonosphere depletion substances.

3.3 Water Environment

China has intensified its efforts to tackle environmental pollution in cities and key areas. Achievements have been made in control-by-stages of pollution in the Huaihe River valley, and the environmental quality in some regions has been improved. But the growth of population and economic development have exerted great pressure on resources, and the ecological environment in some areas continues to deteriorate.

China's seven large water systems, lakes, reservoirs, underground water in some regions and coastal waters have been contaminated to varying degrees. The dry and semi-dry regions in the north and many cities suffer from serious shortages of water. Shortage of water resources and water pollution have become factors restricting China's economic and social development.

The major indicators of river pollution are the levels of ammonia nitrogen and volatile phenol, the hypermanganate index, biochemical oxygen demand and total amount of mercury.

The pollution of large fresh-water lakes and urban lakes is of an intermediate level, and the pollution level of reservoirs is mild. The major indicators of pollution in large fresh-water lakes and urban lakes are the levels of total nitrogen and total phosphorous, the hypermanganate index and the biochemical oxygen demand.

The major indicators of large reservoir pollution are the levels of total phosphorous, total nitrogen and volatile phenol. Some lakes and reservoirs suffer from mercury pollution, while individual reservoirs suffer from arsenic contamination.

The major indicators of coastal water pollution are the levels of inorganic nitrogen and inorganic phosphorous. Of the country's four seas, the East China Sea suffers from the most serious pollution, followed by the Bohai, Yellow and South China seas.

3.4 Industrial Solid Waste

Solid waste pollution has become another serious problem affecting the quality of the environment. It not only occupies land, but also contaminates underground water and other water sources, and emits toxic and hazardous fumes.

Over the past dozen years, the generation and stockpiling of solid waste increased year by year until the 1990s, when the momentum began to subside. After

the adoption of certain effective measures, the amount of solid waste discharged dropped sharply from 133.06 million tons in 1986 to 22.42 million tons in 1995. The rate of comprehensive utilization increased from 23 percent in 1985 to 42.9 percent in 1995, and the amount disposed of rose from 116.96 million tons in 1991 to 142.04 million tons.

China is among the top ten producers and consumers of plastic products. In 1995, it produced 5.19 million tons and imported nearly six million tons of plastics. The national consumption of plastics that year amounted to some 11 million tons, of which 2.11 million tons were wrapping plastics, most of which is abandoned to pollute the environment in the forms of waste film, bags and tableware.

Urban garbage has increased in quantity annually with the growth of the urban population. In 1997, a total of 140 million tons of garbage and night soil were safely disposed of. The phenomenon of cities being besieged by garbage is serious.

3.5 Poisoning

According to national occupational poisoning reports, there are some 50,000 cases of occupational poisoning and 100,000 cases of pesticide poisoning a year in China (35 percent of harmful operating factories and mines were monitored. The rate of poisoning cases failing to be reported is some 80 percent). Food poisoning reports from 1989 to 1999 show that a total of 11,288 cases of chemical poisoning, 12,719 cases of bacterial poisoning, 448 cases of fungal poisoning, 2,111 cases of toxic animal food poisoning and 642 cases of toxic plant poisoning occurred during the period. The average annual incidence of poison-related diseases is around 5,000 cases. But with social development, the category of substances causing poisoning has changed. An investigation by a hospital in Shenyang City showed that of the poisoning cases, medicinal poisoning accounted for 56 percent, carbon monoxide poisoning accounted for 19 percent, food poisoning accounted for 5.5 percent, pesticide poisoning accounted for 5.5 percent and alcohol poisoning for 4.9 percent. These figures show that the incidence of poisoning in China has shifted from being mainly occupational and pesticide poisoning to medicinal poisoning and daily life-related poisoning, as in Western countries. Statistics show that poisoning in China is most prevalent among the population in the 20-39 age group, which makes up over 60 percent of those poisoned. This is different from the situation in Western countries, where children make up more than half of those poisoned.

Chapter 4: Legal Instruments and Regulatory Instruments for Managing Chemicals

China began to strengthen its environmental-protection legislation in the 1970s, with provisions to supplement those concerning protection of the environment and natural resources in the Constitution.

Such a system consists roughly of seven parts, that is, the Constitution of the People's Republic of China, laws on environmental protection, administrative statutes concerning environmental protection, local laws and regulations, rules enforced by environmental protection administrations and local governments, international conventions on protection of the environment, and environmental standards.

The Constitution serves as the base and the core of the country's environmental legal system. The Environmental Protection Law (revised in 1989) is the fundamental law on environmental protection. All environmental protection laws are adopted and promulgated by the NPC and its Standing Committee, while administrative statutes are formulated and promulgated by the State Council. The related ministries and commissions under the State Council issue environmental protection regulations and rules within the scope of their power. What's more, the State and localities have also formulated a group of environmental standards.

China has signed and joined some international environmental protection conventions and agreements which include the Vienna Convention on the Protection of the Ozone Layer, Basel Convention on the Control of Trans-boundary Movements of Hazardous Wastes and Their Disposal, UNEP London Guidelines for the Exchange of Information on Chemicals in International Trade, and Rotterdam Convention on the Prior Informed Consent for Certain Hazardous Chemicals and Pesticides in International Trade. They form an integral part of China's environmental protection legal system.

4.1. Government Departments Related to Chemicals Management and Their Responsibilities

In China, chemicals are divided by use category into industrial chemicals, agricultural chemicals (fertilizers and pesticides), medicines, veterinary medicines, food additives, disinfectants and cosmetics. Chemicals are involved in various links, including import and export, production, transport, storage, distribution, use and disposal. There are corresponding rules and standards for the management of almost all these links by different departments. The major State departments managing chemicals are as follows:

State Administration of Petroleum and Chemical Industry (management of petrochemical and chemical production);

Ministry of Health (management of occupational health, environmental hygiene, food hygiene and chemicals for daily use)

State Drug Administration (management of medicines)

Ministry of Agriculture (management of pesticides, veterinary medicines and fertilizers)

Ministry of Communications (management of road and water transport)

Ministry of Railways (management of railway transport)

General Administration of Civil Aviation of China (management of air transport)

Ministry of Public Security (fire control, explosion and highly toxic goods management)

State Economic and Trade Commission (management of industrial and occupational safety)

Ministry of Foreign Trade and Economic Cooperation (management of import and export)

State Administration of Internal Trade (management of the domestic distribution of chemicals)

General Administration of Customs (management of entry and exit of imported and exported chemicals)

State Environmental Protection Administration (environmental management of chemicals and hazardous wastes)

State Bureau of Quality and Technical Supervision (management of product quality and hazardous chemicals)

In addition, various related ministries and commissions exercise separate management of the production, use, distribution, transport, import and export of chemicals within their powers and in accordance with State laws and regulations.

4.2 Overview of National Legal Instruments Concerned With the Management of Chemicals

The Chinese Government attaches great importance to the safe management of chemicals, having formulated a series of laws, regulations and standards and having adopted rules and methods concerning chemicals management under the guideline of “safety first, prevention first”. These measures play an active role in effectively controlling the harm done by chemicals. Although special legislation on the control of chemical pollution is not yet available, the Regulations on the Safe Administration of Chemicals and Other Dangerous Materials issued by the State Council cover seven types of hazardous goods. They are toxic chemicals, explosives, compressed and liquid gases, inflammable liquids and solids, spontaneous combustibles and wet combustibles, oxidants, and organic superoxides and corrosives. But radioactive chemicals and chemicals subject to existing special State laws and regulations are excluded. The Regulations stipulate specific rules on the

production, use, storage, transport and distribution of hazardous chemicals. China practices a licensing system concerning the production, distribution and import and export of hazardous chemicals, and an examination and approval system concerning the use, storage and transport of such chemicals.

China has also promulgated the Pharmaceuticals Administration Law, Provisional Regulations for the Administration of Veterinary Medicines and the Regulations on the Management of Pesticides. An improved registration and testing system has been established. The Law on the Prevention and Control of Environmental Pollution Caused by Solid Wastes, Food Hygiene Law and Regulations Concerning Hygiene Supervision of Cosmetics have also been enacted for the management of solid wastes, food additives and cosmetics, respectively .

In view of the increasing quantity, variety and danger involved in the import and export of chemicals, and in order to strengthen the management of chemicals, implement the London Guidelines, the State Environmental Protection Administration, General Administration of Customs (GAC), and Ministry of Foreign Trade and Economic Cooperation (MFTEC) jointly issued the Regulations on the Environmental Management of First Import of Chemicals and the Import and Export of Toxic Chemicals and the List of Toxic Chemicals Banned or Strictly Restricted in China (first group) in May 1994.

Because of the great risk potential, frequency of accidents and great difficulties in post-accident settlements, Ministry of Railways has enacted the Rules for the Railway Transport of Dangerous Goods. The Ministry of Communications has enacted the Regulations for the Supervision and Administration of the Water Shipment of Dangerous Goods, Provisional Regulations for the Port Management of Dangerous Goods, and the Regulations for Road Transportation Management of Dangerous Goods.

4.3 Existing Legislation by Use Category Addressing the Various Stages of Handling Chemicals from Production/Import through Disposal

4.3.1 Production License

The Regulations on the Safe Administration of Chemicals and Other Dangerous Materials stipulates that the establishment, expansion and transformation of enterprises engaged in the production of hazardous chemicals shall be subject to examination and approval by the relevant provincial-level government. The party concerned shall apply to the local administration of chemical industry for a production license and shall register with the local administration of industry and commerce.

In accordance with the State Council’s Proposed Regulations Concerning Production Licenses for Industrial Products (1984), the Ministry of Chemical Industry is responsible for the issuing, management and supervision of licenses for the production of chemicals. In 1987 the ministry issued the Rules for the

Management of Chemical Production Licenses, which set the qualification requirements for the licenses. Since 1999, the State Bureau of Quality and Technical Supervision became responsible for the issue and management of the Dangerous Chemicals Production Licenses.

The State Pharmaceutical Administration and the State Administration of Petroleum and Chemical Industry are responsible respectively for examining and approving the production and distribution of pharmaceuticals, narcotics, veterinary medicines and pesticides, and for issuing production and distribution licenses.

4.3.2 Registration

Chemical pesticides and the clinical testing of foreign medicines in China are subject to a registration system.

The Regulations on the Management of Pesticides (1997) stipulate that new pesticides imported from abroad or developed in China shall be registered before being put into production; otherwise, the production, marketing and use of them shall be banned. When an application for the registration of such a pesticide is filed, data concerning the composition of the product, its physical and chemical properties, production technology, product standard, applied technology, toxicity, residues and influence on the environment shall be furnished, together with samples.

Where a pesticide has been found to be seriously detrimental to the environment, human beings, animals and other useful organisms following examination by the National Pesticides Register Review Board, the Ministry of Agriculture shall announce restriction on its use or recall its registration.

Foreign medicine research institutes and producers which seek the registration of their products or the conducting of clinical tests in China and thereby apply for import licenses shall be subject to examination and approval by the Pharmaceuticals Administration of the Ministry of Health (currently the State Drug Administration).

In 1990, the Ministry of Chemical Industry published the first list of 50 key kinds (categories) of toxic chemicals for registration and issued the Rules on the Administration of Toxic Chemicals Register (executed on a trial base). Chemical industrial enterprises are required to produce, process, use and store such chemicals in accordance with the procedures provided in the Declaration on New Toxic Substances. Meanwhile, they are required to implement the MSDS (material safety data sheets) system. Toxic Substances Register covers seven parts: identification tag of a toxic substance, physical and chemical properties, technology, distribution of enterprises and workshop protection measures, toxicology, detriment to health and impact on the environment and the ecology, and methods of eliminating leakages.

4.3.3 Storage and Transportation Control

The Regulations on the Safe Administration of Chemicals and Other Dangerous Materials stipulate that the storage of toxic chemicals must meet following requirements:

A. Having special warehouses, grounds and special personnel. Examination

and registration must be done before such chemicals are put in storage, and regular checks must be made afterwards. Strict management of the replenishment and distribution of the stock must be exercised.

B. The warehouses shall not be located in thickly populated urban areas, and shall be provided with safety, fire-control, fire-fighting, communication and warning facilities.

C. Hazardous chemicals should be stored and supervised separately by category. The stocks shall not go beyond the limits prescribed by the departments in charge and the public security department.

According to the provisions of the Rules for Railway Transport of Dangerous Goods (1962), the Rules for Road Transportation of Dangerous Goods, the Rules for Dangerous Goods Transported by Automobiles, the Rules for Automobile Transportation and Loading and Unloading of Dangerous Goods, and the Regulations for the Supervision and Administration of the Water Shipment of Dangerous Goods (1982), which list 609 toxic chemicals, the consignor shall register with the railway, highway and port supervision departments, fill out waybills, submit the names, quantity and nature of such chemicals as well as the fire-control and protection measures and poisoning remedies, and supply the prescribed packing signs. In the case of toxic chemicals which are not on the list, the consignor shall submit to the department in charge of communications the danger technology expertise report examined and verified by the relevant provincial or municipal chemical industry department before shipment; the shipment can be carried out only upon examination and approval by the department in charge of communications. The Regulations on the Safe Administration of Chemicals and Other Dangerous Materials also bans the loading of hazardous chemicals on passenger trains and the cabins of ships and airplanes. It also stipulates that trucks carrying hazardous chemicals shall pass through urban areas at the times and along the routes prescribed by the local public security department.

4.3.4 Import/Export Control

China practices a licensing system for imports of goods. In accordance with the provisions of the Interim Regulations on Licensing Imports of Goods, the MFTEC issues the licenses on behalf of the State. The provincial foreign trade administrations may also issue local licenses within the scope fixed by the MFTEC.

The China National Chemicals Import & Export Corporation is responsible for dealing in the import and export of important chemicals including petroleum, fertilizers and natural rubber, while 200 other companies, including local chemicals import and export corporations and the China National Chemical Construction Corporation under the Ministry of Chemical Industry deal in the import and export of the remaining majority part of chemical industrial products. Within their authorized business scope, these companies are exempt from import licenses except in the case of imports restricted by the State.

The Interim Rules on Examination and Approval of Pesticides Imports issued

by the Ministry of Chemical Industry in 1985 stipulate that a pesticide to be imported must have obtained an effective registration certificate in China. After the import applicant submits the application to the Ministry of Chemical Industry and gets approval, MFTEC will issue the license. Imports of pharmaceuticals and veterinary medicines are subject to examination and approval by the Ministry of Health and the Ministry of Agriculture, respectively.

According to the Regulations for Implementing the Regulations Concerning Hygiene Supervision of Cosmetics (1991), where a cosmetic is imported for the first time, a foreign manufacturer and its agent shall obtain and fill out the Application for Cosmetic Import Health License at the prefectural health administrative authority of the importing region and submit it directly to the Ministry of Health. A product which passes the examination shall be awarded a "Cosmetic Import Health License" and an approval number, following approval by the Ministry of Health.

According to the Regulations on the Environmental Management of First Import of Chemicals and the Import and Export of Toxic Chemicals jointly issued by the SEPA, MFTEC and General Administration of Customs, the SEPA exercises unified environmental supervision and management over first import of chemicals (excluding food additives, pharmaceuticals, veterinary medicines, cosmetics and radioactive substances) and the import and export of toxic chemicals. The SEPA is also required to be responsible for the implementation of the Prior Informed Consent procedures of the London Guidelines, to publish the list of toxic chemicals banned or strictly restricted in China, and to be responsible for environmental management registration and examination and approval for the first import of chemicals and the import and export of toxic chemicals on the list.

4.4 State Laws, Rules and Regulations Concerning the Management of Chemicals

State laws:

The Environmental Protection Law of the People's Republic of China was revised and put into effect in 1989. The law was enacted for the purpose of protecting and improving the living environment and ecological environment, preventing and controlling pollution and other public hazards to human health and to promote the development of socialist modernization construction. The environment mentioned in the law refers to the total of various natural elements and artificially transformed natural elements which affect the survival and development of human society. This law applies to the territory of the People's Republic of China and maritime areas under the jurisdiction of the People's Republic of China.

The Marine Environment Protection Law of the People's Republic of China went into force in 1983 and was amended in 1999. The law was enacted for the purpose of protecting the marine environment and resources, preventing pollution, preserving the ecological equilibrium and human health, and promoting the development of marine undertakings. It applies to Chinese inland waters, territorial

waters, contiguous zones, exclusive economic zones, continental shelves as well as to other maritime areas under the jurisdiction of the People's Republic of China.

The Law of the People's Republic of China on the Prevention and Control of Water Pollution went into force in 1984, and was revised in 1995. This law was enacted for the purpose of preventing and controlling water pollution, and protecting and improving the environment to safeguard human health, guarantee the effective utilization of water resources and promote the development of socialist modernization construction. It is aimed at pollution prevention and control of surface waters, including rivers, lakes, canals, irrigation ditches and reservoirs, as well as underground waters.

The Law of the People's Republic of China on the Prevention and Control of Air Pollution went into force in 1988, and was revised in 1995 and 2000. This law was enacted for the purpose of protecting and improving the living and ecological environments, safeguarding human health and promoting the development of socialist modernization construction.

The Pharmaceuticals Administration Law of the People's Republic of China was promulgated on September 20, 1984. A pharmaceuticals manufacturer can go into business only after obtaining a Pharmaceuticals Manufacturer's License. The administration of industry and commerce shall not grant the proposed manufacturer a business license if the latter has not obtained a Pharmaceuticals Manufacturer's License.

The Law on the Prevention and Control of Environmental Pollution Caused by Solid Wastes went into force in 1996. It was enacted for the purpose of preventing solid wastes from contaminating the environment, safeguarding human health and promoting the development of socialist modernization construction. It is aimed at the prevention and control of environmental pollution caused by solid wastes within the territory of the People's Republic of China.

The Food Hygiene Law of the People's Republic of China went into force on October 30, 1995. It administers food production and distribution within the territory of China.

The Law of People's Republic of China on Fire Control went into force in 1998. It administers the danger of fire from combustible and explosive chemicals during the process of production, use, storage, distribution and transportation.

Rules and Regulations:

The Regulations on the Safe Administration of Chemicals and Other Dangerous Materials, issued by the State Council on February 17, 1987, administer the production, storage, distribution, transport and use of chemicals and other dangerous materials.

The Regulations for Implementing the Regulations on the Safe Administration of Chemicals and Other Dangerous Materials, jointly issued by the Ministry of Chemical Industry and the Economic and Trade Office of the State Council, apply to manufacturers of hazardous chemicals or other manufacturers

using hazardous chemicals as raw materials, competent administrative bodies and supervisory bodies at various levels, related scientific research institutes and design institutes.

The Rules on the Administration of Toxic Chemicals Register, issued by the Ministry of Chemical Industry on April 15, 1993, apply to enterprises and institutions producing and using toxic chemicals. They focus on the methods and administration of toxic chemicals registration, including a list of 53 toxic chemicals on the Toxic Chemicals Register, MSDS, Declaration on New Toxic Substances, and priority registration and management.

The Regulations on the Environmental Management of First Import of Chemicals and the Import and Export of Toxic Chemicals were jointly issued by the SEPA, the General Administration of Customs and the Ministry of Foreign Trade and Economic Cooperation on May 1, 1994. These Regulations administer the first import of chemicals and the import and export of chemicals on the List of Toxic Chemicals Banned or Strictly Restricted in China. Food additives, pharmaceuticals, veterinary medicines, cosmetics and radioactive substances are excluded. So far, there are 27 chemicals on the list.

The Rules for the Management of Chemical Production Licenses, issued by the Ministry of Chemical Industry in 1987, stipulate that an enterprise must meet the following requirements before obtaining a chemicals production license: a) Having a business license issued by the administration of industry and commerce; b) The products must be up to the existing State standard or professional (ministerial) standard; c) Having the prescribed production technology, equipment, professional and technical requirements, and facilities to ensure safe production, industrial hygiene and environmental protection.

The Rules for the Granting of Hazardous Chemicals Distribution Licenses were jointly issued by the former Ministry of Commerce, State Planning Commission, Ministry of Public Security, State Administration of Industry and Commerce, State Bureau of Materials and Equipment Supplies and State Pharmaceuticals Administration. These Rules apply to enterprises distributing and marketing poisonous chemicals.

The Rules on the Safety in Use of Chemicals at Workplace were jointly issued by the Ministry of Labor and Ministry of Chemical Industry on January 1, 1997. These Rules apply to all units and employees engaged in the production, marketing, transport, storage and use of chemicals, and involve identification, classification and registration of chemical danger, and the safety labeling and technical safety specifications of hazardous chemicals.

The Rules on the Administration of Pollutant Discharge Declaration and Registration were issued in 1992 by the State Environmental Protection Administration. These Rules apply to the declaration and registration of the discharge of pollutants.

The Rules Concerning Environmental Pollution Caused in the Production of Chromium Compounds were issued by the Ministry of Chemical Industry and the

State Environmental Protection Administration on May 5, 1992. These Rules apply to all enterprises and individuals engaging in the designing and building of chromium compound plants and in the production of chromium compounds.

The Regulations on the Administration of Environmental Protection in Construction Projects was adopted by the State Council on November 18, 1998. All units concerned are required to observe the standards for pollutants discharge in order to prevent construction projects from generating new pollution and damaging the ecological environment.

The Regulations on Control of Dumping Wastes in the Ocean, issued by the State Council in 1985, stipulate that to dump or otherwise dispose of wastes in sea, the party concerned must file in advance an application to the oceanic administration, and may carry out the operation only upon obtaining approval and a waste dumping license. The Regulations prohibit the dumping of four types of wastes, including organic halogen compounds and mercury and its compounds, in the sea. Special licenses are required to dump nine types of wastes containing arsenic and lead in the sea.

The Interim Regulations on Environmental Protection Management of Wastes Imports were jointly issued by the SEPA, MFTEC, General Administration of Customs, State Administration of Industry and Commerce and State Administration for Commodity Inspection on March 1, 1996. These Regulations apply to the import of wastes and relevant environmental supervision and management within the territory of the People's Republic of China. Imported wastes may not be dumped, stockpiled or disposed within China's territory. The SEPA exercises supervision and management of imports of wastes nationwide.

The Rules on Preventing Electrical Devices Containing Polychlorinated Biphenyles and Their Wastes from Polluting the Environment were issued by the SEPA and the Ministry of Energy on January 23, 1991. These Rules apply to power capacitors, transformers and other devices using polychlorinated biphenyles as host materials and the resulting wastes containing polychlorinated biphenyles.

The Regulations of the People's Republic of China Concerning the Administration of Civil Explosives were issued by the State Council on January 6, 1984. The production, storage, marketing, purchase, transport and use of civil explosives are subject to strict management according to the Regulations.

The Rules on Fire Control Supervision and Management of Inflammable and Explosive Chemicals were issued by the Ministry of Public Security on March 24, 1994, and apply to units and individuals engaging in the production, use, storage and distribution of inflammable and explosive chemicals. The details of supervision and administration are provided by the safety verification system and the Fire Safety License.

The Rules of the Ministry of Railways Concerning the Transport of Dangerous Goods were issued by the Ministry of Railways in 1995. They administer the packaging and transportation of hazardous chemicals.

The Regulations Concerning Hygiene Supervision of Cosmetics were issued

by the State Council on January 1, 1990. They apply to all organizations and individuals engaging in the production and marketing of cosmetics.

The Regulations on the Management of Pesticides were issued by the State Council on May 8, 1997. They administer various types of pesticides used against agricultural, forestry and animal husbandry diseases, pests, weeds and other pernicious organisms, and for regulating the growth of plants (including the sources of chemical pesticides and preparations, and biological pesticides), including new types of pesticides made in China and pesticides marketed in China by foreign manufacturers.

The Regulations for the Administration of Veterinary Medicines were issued by the State Council on January 1, 1988. They govern veterinary pharmaceuticals manufacturers and dealers, pharmaceuticals management of veterinary hospitals and stations, examination and approval of new veterinary medicines, and the import and export of veterinary medicines.

The Rules on the Safe Use of Pesticides were issued by the Ministry of Agriculture and Ministry of Health on June 5, 1982. These Rules administer the classification of pesticides, use scope of pesticides, purchase, transport and storage of pesticides, points for attention related to the use of pesticides, selection of personnel applying pesticides and human health protection.

The Rules for Management on Transportation of Dangerous Goods by Water was issued by Ministry of Communications in 1996. The Rules administer domestic shipment of dangerous chemicals.

The Regulations on the Administrative Protection of Agricultural Chemicals were issued by the State Council on January 1, 1993. The Regulations give administrative protection to the legal rights of owners of imported agricultural chemicals.

Rules of the Ministry of Chemical Industry for Implementing the Regulations on the Management of Pesticides were issued on January 16, 1998, and outline the provisions concerning the administration of chemical industrial departments over pesticides production.

The Rules for Implementing the Regulations on the Management of Pesticides were issued by the Ministry of Agriculture on July 23, 1999. According to the Rules, the agricultural departments are responsible for the testing, registration, distribution, use and post-registration supervision and management of pesticides.

The Rules for Supervision and Management on Fire Control and Safety of Flammable and Explosive Goods were issued by the Ministry of Public Security in 1994.

The Rules for Management on Road Transportation of Dangerous Goods were issued in 1993.

4.5 Standards Relating to the Management of Chemicals

The Classification and Identification of Common Hazardous Chemicals (GB 57-92) classifies common hazardous chemicals by their major hazard types, and specifies the danger standards and the packaging signs for hazardous chemicals.

The Level, Classification and Code of Hypertoxic Substances (GA 57-93) divides highly toxic substances into Grade A and B organic virulent toxicants and Grade A and B inorganic virulent toxicants, according to their chemical classification and toxicity.

The List of Hypertoxic Substances (GA58-93) includes names and codes of some 500 high toxic substances.

The Principles for Preparing Safety Labels for Hazardous Chemicals (GB/T 15258-94) specify the information that safety labels should supply as well as the form of preparing such labels. There are also specifications for the printing and use of the labels.

The Principles for the Naming of Hazardous Goods (GB 7694-87) specify the rules for the naming of hazardous chemicals.

The Name List of Hazardous Goods (GB 12268-90) includes the names of more than 5,000 hazardous chemicals in nine categories.

The Grading of Hazards from Occupational Exposure to Toxic Substances (GB 5044-85) classifies the types of detriment to human health from occupational exposure to toxic chemicals, including raw materials, finished products, semi-finished products, intermediates, reaction by-products and impure substances, the toxicity of which may intrude into the human body through the respiratory tract, skin or mouth, into four degrees: extremely high, high, intermediate and light.

The Principles for Classification of Dangerous Goods Transportation Packaging (GB/T 15089-94) specify the basic principles for the transportation packaging classification of various types of dangerous goods. The dangerous goods are divided into three packaging classes — Class I, Class II and Class III — according to their degrees of hazard.

The List of Package Logos of Dangerous Goods (GB 190-90) specifies the type, name, size and color of the logos to be represented on packages of dangerous goods. There are a total of 21 such logos.

The General Rules Concerning the Storage of Common Hazardous Chemicals (GB15603-1995) detail the requirements concerning the ways of storage, warehouse management and disposal of wastes according to the properties of the various types of hazardous chemicals.

The Standards for the Safe Use of Pesticides of the People’s Republic of China include the Guidelines (I) on the Rational Use of Pesticides (GB 8321.1-87), Guidelines (II) on the Rational Use of Pesticides (GB 8321.2-87), Guidelines (III) on the Rational Use of Pesticides (GB 8321.3-89), Guidelines (IV) on the Rational Use of Pesticides (GB 8321.4-93) and Guidelines (V) on the Rational Use of Pesticides (GB 8321.5-97).

The Procedures for Toxicological Safety Assessment of Pesticides apply to various types of pesticides which require a toxicological safety assessment.

The Rules for the Preparation of Technical Instructions on Chemical Safety(GB 16483-1996) mainly cover the technical rules of the Material Safety Data Sheets.

The Classification of Goods Dangerous to Transport and Their Designations (GB-6944-86) applies to the classification of dangerous goods and their designations during transportation.

The Rules for Automobile Transportation of Goods, JT3130-88.

The Basic Requirements and Tests of Packing for Dangerous Goods Transported on Road and by Water, JT0017-88.

The Rules for Automobile Transportation and Loading and Unloading of Dangerous Goods, JT3145-88.

The Cosmetic Safety Assessment Procedures and Methods of the People's Republic of China (GB 7919-87) apply to all cosmetic raw materials and products made and marketed in China.

The Standards for Cosmetic Hygiene (GB 7916-87) apply to producers of and dealers in cosmetics, and importers of cosmetics..

The Chemical Standard Test Methods for Cosmetic Hygiene (GB 7917.1-7918.4-87) were issued by the Ministry of Health on October 1, 1987.

The Proposed Procedures for Food Safety Toxicological Assessment apply to chemical and biological substances used for producing, processing and preserving food; hazardous substances generated during the course of food production, processing, transportation, marketing and preservation; new food resources and their composition; and other hazardous substances in food.

The Labor Health Standards and the Environmental Health Standards for Chemicals and Health Standards for Disinfectants were issued by the Ministry of Health.

Rules of Gas Protection during the Storage and Transportation, Marketing and Use of Pesticides was issued by the State Bureau of Quality and Technical Supervision and went into force on September 1, 1991.

4.6 International Chemical Conventions Under Implementation

London Guidelines for the Exchange of Information on Chemicals in International Trade (amended in 1989);

International Marine Dangerous Goods Code (International Maritime Organization);

Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on Their Destruction (1997);

The ILO 1990 Convention on the Safety of Chemicals at the Workplace (No. 170);

The Basel Convention on Control of Trans-boundary Movements of Hazardous Wastes and Their Disposal (1989);

The Vienna Convention on the Protection of the Ozone Layer (1989);

United Nations Convention Against Illicit Traffic in Narcotic Drugs and Psychotropic Substances;

Rotterdam Convention on the Prior Informed Consent for Certain Hazardous Chemicals and Pesticides in International Trade (1998).

4.7 Comments/Analysis

As the management of chemicals involves a great number of functional departments, plus restrictions imposed by China's national conditions and limited technological support capacity, none of these laws and regulations has been executed to a satisfactory extent. Complete legislation on chemicals management at the national level is not available yet, and the existing legislation does not form a complete system. Laws and regulations on the management of new chemical substances and chemicals that require priority management are lacking. In addition, the environmental management of chemicals remains a weak link. All the existing laws and regulations are aimed at certain categories of chemicals or certain aspects of chemicals management.

Chapter 5: Ministries, Agencies and Other Institutions Managing Chemicals

5.1 General Framework of Chemicals Management in China

In China, chemicals are divided by their use category into industrial chemicals, agricultural chemicals (chemical fertilizers, pesticides), medicines, veterinary medicines, food additives and cosmetics. Chemicals management involves all stages of the chemical life cycle from import and export, production, transport, storage, marketing and use to disposal. China has formulated a number of laws, regulations and standards for the management of chemicals, which are, however, far from perfect. It is, therefore, a top-priority task to build up a complete and sound system of legislation for chemicals management.

The NPC Standing Committee of the People's Republic of China formulates and promulgates national laws, including laws relating to chemicals. The State Council formulates and promulgates national regulations and rules, including those relating to chemicals. The relevant ministries and commissions formulate and issue regulations and standards for chemicals under national or sectoral management. In addition, some provinces, municipalities and autonomous regions have formulated local legislation and standards. All these form a general framework for chemicals management in China.

In terms of administration, the State Environmental Protection Administration is responsible for the pollution control and environmental protection aspect of chemicals. The authority of chemical industry is responsible for the production and safety of chemicals. The Ministry of Health is responsible for toxicity tests of chemicals and the administration of occupational sites, environmental hygiene, and hygiene of food and chemicals for daily use. The Ministry of Communications is responsible for safety in the transportation of chemicals. The Ministry of Agriculture is responsible for the use and management of agricultural chemicals. The authorities in charge of public security and fire control are responsible for security in relation to flammable and explosive chemicals and the leakage of highly toxic chemicals. Table 5.1 provides a general overview of ministerial responsibilities related to chemicals management for each stage of the chemical life cycle from production/import through disposal.

5.2 Responsibilities of Different Ministries

State Environmental Protection Administration

The SEPA, an organization directly under the State Council, is the highest administrative authority responsible for environmental protection in China. It has corresponding agencies in various provinces, municipalities and autonomous regions as well as in prefectures and counties. The SEPA takes charge of environmental

protection work nationwide, which mainly includes pollution control, protection of the natural ecology and environmental monitoring. Chemicals management is also one of important tasks of environmental protection.

Table 5.1 Government Departments and Their Responsibilities

Government departments	Import	Export	Produc-tion	Stor-age	Trans-port	Distribu-tion/ marketing	Use	Dispo-sal
SEPA	√	√		√			√	√
Ministry of Health	√		√			√	√	
Ministry of Agriculture	√	√	√	√	√	√	√	√
SETC			√	√	√	√	√	√
State Administration of Internal Trade				√		√		
SAPCI	√		√	√			√	√
MFTEC	√	√						
Ministry of Communications				√	√			
Ministry of Railways				√	√			
GACAC				√	√			
ADA	√		√	√		√		√
State Administration of Light Industry			√	√				√
MPS			√	√	√	√	√	√
State Bureau of Quality and Technical Supervision			√			√		
GAC	√	√						

The SEPA, in accordance with the Regulations on the Environmental Management of First Import of Chemicals and the Import and Export of Toxic Chemicals, is responsible for the examination and approval of chemicals import and export, environmental supervision and management in chemical production and use, and for the emergency responding to and handling of chemical contamination accidents. It participates in international activities concerning the environmental management of chemicals on behalf of the State and coordinates with other departments concerned to participate in international activities. It participates in the formulation of international conventions and agreements concerning the environmental management of chemicals, and is responsible for the execution of

such international conventions and agreements within China. It is also responsible for inter-departmental coordination in carrying out environmental protection.

State Economic and Trade Commission (SETC)

The SETC and the State Administration of Petroleum and Chemical Industry (SAPCI) are responsible for the supervision and management of the production, transportation, storage and use of hazardous chemicals in accordance with the Regulations on the Safe Administration of Chemicals and Other Dangerous Materials. They exercise the power of examination and approval over the establishment of hazardous chemicals plants and the expansion or transformation projects of existing hazardous chemicals plants. They issue production licenses to manufacturers of hazardous chemicals, and take charge of safety registration for manufacturers and users of hazardous chemicals. They are also responsible for safety and workers' health during the process of chemicals production, transportation, storage and use.

In addition, they exercise supervision and management of the production of pesticides across the country, in accordance with the Regulations on the Management of Pesticides, practicing a system of examination and approval for manufacturers of pesticides and a licensing system for the production of pesticides.

Ministry of Health

In accordance with the provisions of the Food Hygiene Law, the Law on the Prevention and Control of Contagious Diseases and the Regulations Concerning Hygiene Supervision of Cosmetics, the Ministry of Health is responsible for making chemical toxicity assessments and assessments of the harmfulness to human health of chemicals; exercising supervision and management over food, food additives, cosmetics and disinfectants; and carrying out safety assessments.

It is also responsible for the control and assessment of the harmfulness of chemicals to human health; chemical toxicity assessment and poisoning prevention and control; occupational health of workers in the course of producing and using chemicals; and the public health management of chemicals.

State Drug Administration (SDA)

The SDA exercises supervision and management of the production, distribution and use of medicines, in accordance with the Pharmaceuticals Administration Law.

Ministry of Agriculture

The State empowers the Ministry of Agriculture to exercise the management of agricultural chemicals (pesticides, fertilizers), veterinary medicines and animal food additives.

The Ministry of Agriculture exercises supervision and management of pesticides at the national level, in accordance with the Regulations on the Management of Pesticides. The State carries out a pesticide registration system. All

pesticides made domestically or imported from abroad must be registered with the ministry, and may not be put on the market until the registration is approved. The ministry is also responsible for the safe use of pesticides and for formulating standards for the rational use of pesticides.

It has the power to exercise management of the production and distribution of veterinary medicines, to examine and approve new veterinary medicines and manage the import and export of veterinary medicines, in accordance with the Regulations for the Administration of Veterinary Medicines.

It exercises management of the production and registration of feed additives, in accordance with the Regulations on the Administration of Feeds and Feed Additives.

It is responsible for the national registration of fertilizers (including chemical fertilizers) in accordance with the provisions of the State Council on the determination of functions.

State Bureau of Quality and Technical Supervision

This bureau is responsible for quality control and management of dangerous chemicals, issuing of dangerous chemicals production licenses as well as for the standardization of chemicals.

Ministry of Communications

This ministry is responsible for the management of the transportation of explosives, compressed and liquid gas, combustible liquids and solids, spontaneous combustibles and wet combustibles, oxidants, poisons and corrosives by sea, inland waterways and highways.

Ministry of Railways

This ministry is responsible for the management of rail transportation of explosives, compressed and liquid gas, combustible liquids and solids, spontaneous combustibles and wet combustibles, oxidants, poisons and corrosives.

General Administration of Civil Aviation of China (GACAC)

The GACAC is responsible for the management of air transportation of explosives, compressed and liquid gas, combustible liquids and solids, spontaneous combustibles and wet combustibles, oxidants, poisons and corrosives.

Ministry of Public Security (MPS)

This ministry is responsible for security in the course of the production, storage, use and transportation of flammable, explosive chemicals and highly toxic chemicals.

General Administration of Customs

It exercises management over the import and export of chemicals.

Ministry of Foreign Trade and Economic Cooperation

This ministry is responsible for management of import and export companies.

Chapter 6: Relevant Activities of Industry, Public Interest Groups and the Research Sector

In China, non-governmental bodies and entities involved in chemicals management and other related activities are divided into three types: industrial organizations and entities, public organizations, and research institutes.

6.1 Industrial Organizations and Entities

Since China began to build a market-oriented economy, great changes have taken place in the chemicals sector. As the government no longer administers this sector directly, enterprises independently engage in production and marketing. Many professional group companies have been established to adapt to the changes in the market and meet the requirements for business development. Such companies include China Natural Gas Group Co., China Petrochemical Industry Group Co., Lu Tian Hua (Group) Co., Ltd., Shanghai Huayi (Group) Co., Jinhua Chemical Industry (Group) Co., Ltd., Tianjin Bohai Chemical Industrial Group Co. and China Lekai Film Group Co.

While carrying out their business activities, China's industrial organizations and entities observe the State's laws, regulations and policies on environmental protection and pay attention to safe production and to protecting workers' health. They formulate their own regulations and rules in accordance with their own conditions, and publicize such rules and regulations among their workers and staff members. Safety inspections are organized frequently and regularly to remove hidden perils and ensure safety in production. They have also established a chemical accident emergency system so as to ensure immediate responses to accidents. A system of poison registration is in force, with poison registration files kept by the enterprises. MSDS are put in prominent places at sites exposed to poisons, to help workers understand the characteristics of poisons and avoid intake of poisons, and facilitate first-aid treatment after poisoning. The ILO 1990 Convention on the Safety of Chemicals at the Workplace (No. 170) has been implemented by industrial organizations and entities, playing a significant part in helping these enterprises to improve and standardize the safety management of chemicals.

These enterprises have a positive attitude toward clean production. In 1995, the China Chemical Industry Technical Association for the Prevention and Control of Pollution was established to promote clean production. The association has played an active role in promoting environmental protection in the chemical industry. Many chemical enterprises have taken the initiative in the comprehensive utilization of resources, reducing the discharge of and pollution from waste gas, waste water and waste residues. Production enterprises also actively support government departments in the updating of laws and regulations concerning environmental protection. They

also develop international cooperation and carry out studies on overall control of pollutants.

6.2 Public Organizations

A great number of public organizations in China show great interest in the sound management of chemicals. Such organizations are divided mainly into three types: industrial associations, environmental protection societies and medical societies.

Industrial Associations

An industrial association is a voluntary non-governmental organization of enterprises of the same or related trades, registered with the relevant government department. Such associations include the China Pesticide Industry Association, China Chlorine Alkali Industry Association, China Nitrogen Fertilizer Industry Association, and China Phosphate Fertilizer Industry Association.

The major roles of these associations are to conduct exchanges concerning business activities of the industry, including development, science and technology, and business strategies; regulate the business activities of the industry, offer the workers in the industry training in production technology, labor safety, hygiene and health, and environmental protection; implement the State's laws, regulations and standards, and organize environmental protection activities. These associations, concerned about chemical hazards, actively participate in chemical control campaigns, implement the ILO 1990 Convention on the Safety of Chemicals at the Workplace (No. 170) and provide information for relevant government departments to manage chemicals.

Environmental Protection Societies

Such societies include the Chinese Society of Environmental Science, China Industrial Association for Environmental Protection, China Environment Journalists' Association, and Chinese Environmental Protection Foundation. The Chinese Society of Environmental Science has several branches. It conducts academic and technical exchanges concerning environmental science, organizes symposiums and visits, and publicizes knowledge of environmental protection. They concern themselves with issues related to environmental protection, for instance, the discharge of pollutants, and actively participate in activities to control chemicals.

Medical Societies

The China Preventive Medicine Society, China Society of Toxicology and Chinese Medical Association conduct various types of academic and technical exchanges concerning the preventive medicine and toxicology, including environmental health, labor hygiene and occupational diseases, and food nutrition and hygiene. They are concerned with the impact of chemicals on human health,

especially the impact of producing environmental chemicals on workers' health. They also make safety assessments of chemicals, and provide technology and information to relevant government departments for the management of chemicals.

6.3 Research Institutes

In China, many research institutes have made great contributions to the management of chemicals. These institutes belong to different ministries, such as those of the chemical industry, communications, agriculture, environmental protection, and health. They have made various types of studies on chemicals, collected information on chemicals extensively and conducted information exchanges. They have assisted government departments in the formulation of laws, regulations, standards and management programs. They have also provided government departments with a scientific basis for the latter's decision-making concerning chemicals management.

Chapter 7: Inter-Ministerial Commissions and Coordinating Mechanisms

The Chinese Government pays great attention to chemicals safety. It has actively participated in international activities and implemented international treaties, including the Rotterdam Convention and Convention No. 170. It undertakes the obligations of relevant conventions. It has attended the Intergovernmental Forum on Chemicals Safety and participated in the formulation of the convention on the control of persistent organic pollutants (POPs) and the preparation of the National Profile for the management of chemicals.

Domestically, relevant State departments have formulated regulations and standards on chemicals safety, providing chemicals management with legal guarantees. In terms of organizational setup, the State Environmental Protection Administration, Ministry of Health, Ministry of Agriculture, and State Drug Administration were set up. Some departments have set up special bodies, for instance, the SEPA set up a chemicals registration center, and the Ministry of Agriculture set up a pesticide testing institute. The establishment of these organizations institutionally guarantees the implementation of chemicals management. At present, a large number of scientists, specialists and technicians are engaged in the research and management of chemicals. In addition, there are coordinating organizations and commissions which play an active role in effectively carrying out the work relating to chemicals safety and management.

7.1 Inter-ministerial Coordination Group on Chemical Safety

In 1994, a Chinese Government delegation attended the IFCS held in Stockholm. After the meeting, China set up the Inter-ministerial Coordination Group on Chemical Safety in order to carry out the various tasks set out by the IFCS and effectively participate in IFCS activities. Members of the coordination group are from the SEPA, Ministry of Health, Ministry of Agriculture, Ministry of Chemical Industry and Ministry of Labor. The SEPA heads the group, while the Ministry of Health is the deputy group head. The coordination group convenes various types of meetings irregularly, aiming to work out measures to ensure chemicals safety, and to formulate and implement common action plans.

7.2 Coordination Group for Preparing the National Profile

In order to prepare a national profile to assess the national infrastructure for the management of chemicals, an inter-departmental Coordination Group for Preparing the National Profile was set up under the leadership of the SEPA. The coordination group consists of representatives from the SEPA, Ministry of Health,

Ministry of Agriculture, State Economic and Trade Commission and State Administration of Petroleum and Chemical Industry. It has worked out a detailed plan, divided tasks among the related departments, and set up a National Profile writing team, which is composed of writers with rich experience from the SEPA Chemicals Registration Center, Environmental Health Monitoring Institute of the Chinese Academy of Preventive Medical Science, Pesticides Testing Institute of the Ministry of Agriculture, Information Service Center of the *Chemical Industry Daily* and the Institute of Labor Hygiene and Occupational Diseases of the Chinese Academy of Preventive Medical Science.

7.3 Internal Coordinating Mechanisms for Implementing the Rotterdam Convention on the Prior Informed Consent for Certain Hazardous Chemicals and Pesticides in International Trade

In order to implement the Regulations on the Management of Pesticides and the Regulations on Environmental Management of First Import of Chemicals and the Import and Export of Toxic Chemicals, and to fully meet the obligation of protecting the ecological environment and people's health provided in the Rotterdam Convention, China exercises registration control of imported chemicals and the import and export of toxic chemicals and pesticides. The SEPA is responsible for the registration of first import of chemicals and the import and export of toxic chemicals. The Ministry of Agriculture is responsible for the registration of pesticide imports and exports. The customs handle import and export formalities based on the "toxic chemicals environment management pass note" issued by the SEPA and the "pesticide import and export registration certificate" issued by the Ministry of Agriculture. No toxic chemicals may be imported or exported without a "toxic chemicals environment management pass note" and no pesticides may be imported or exported without a "pesticide import and export registration certificate."

7.4 The State Toxic Chemicals Review Board

In order to protect human health and the ecological environment, strengthen the environmental management of first import of chemicals and the import and export of toxic chemicals, and implement the London Guidelines for the Exchange of Information on Chemicals in International Trade, the SEPA, MFTEC and General Administration of Customs jointly issued the Regulations on the Environmental Management of First Import of Chemicals and the Import and Export of Toxic Chemicals. A toxic chemicals review board was established to enforce the Regulations. The board was headed by SEPA. Its members are from ministries, commissions and other institutions, including the SEPA, State Planning Commission, State Economic and Trade Commission, General Administration of Customs,

MFTEC, Ministry of Health, Ministry of Agriculture, State Administration of Petroleum and Chemical Industry, State Administration of Import and Export Inspection. The board is responsible for making overall reviews of the chemicals for which import or export is applied, and advising the SEPA on technical matters concerning the implementation of these Regulations.

7.5 The National Pesticides Register Review Board

In order to strengthen supervision and control of the production, distribution and use of pesticides, guarantee the quality of pesticides, protect the agricultural, forestry and ecological environment, and safeguard the safety and health of human beings and livestock, the Ministry of Agriculture, Ministry of Forestry, Ministry of Chemical Industry, Ministry of Health, Ministry of Commerce and the Leading Group for Environmental Protection under the State Council jointly issued the Rules on Pesticides Registration in 1982. In 1997, the State Council issued the Regulations of the People's Republic of China on the Management of Pesticides. The National Pesticides Register Review Board was established to execute the Rules. The board is composed of specialists in pesticide management and pesticide technology specialists nominated by the departments of agriculture, forestry, chemical industry, health, environmental protection and grain administration, as well as the All-China Federation of Supply and Marketing Cooperatives. An application for official register of a pesticide, after examination and appraisal by the departments of agriculture, chemical industry, health and environmental protection and the All-China Federation of Supply and Marketing Cooperatives, shall be submitted to the National Pesticides Register Review Board for assessment on its chemical properties, toxicology, pesticide effect, residue and environmental effect. If the pesticide is considered to be up to standard, it will be granted a registration certificate by the agricultural administration under the State Council.

7.6 Other Committees

In China, in addition to the aforesaid administrative bodies and coordinating mechanisms in charge of chemical import registration and registration of the import and export of toxic chemicals and pesticides, there are special bodies for the administration of pharmaceuticals, veterinary medicines, cosmetics and food additives. Corresponding committees have also been established to manage special chemicals.

Chapter 8: Data Access and Use

8.1 Availability of Data for National Chemicals Management

In China, the management of the chemical life cycle from production, transport, storage, distribution and use to disposal involves many departments and requires various types of data. Such data include statistical data, research data, data from production enterprises and international data. These constitute the fundamental information for chemicals management. At present, the data available in China cannot meet the need for managing chemicals. Some data, for instance, data concerning chemical impact assessment, risk assessment (environment/health), risk reduction decisions, and accident preparedness/response, should be collected, sorted out and analyzed by special organizations with special personnel and the support of sufficient funds and advanced technology. Some data are products of long-term studies and research with large financial input. Table 8.1 provides an overview of the availability of data for chemicals management in China.

Table 8.1 An Overview of Available Information

Data needed for/to:	Industrial chemicals	Pesticides	Consumer chemicals	Chemical Wastes
Priority setting	Limited	Limited	Nil	Available
Assess Chemicals Impact	Limited	Limited	Nil	Limited
Risk assessment (environment/health)	Nil	Nil	Nil	Nil
Classification/labeling	Available	Available	Available	Available
Registration	Available	Available	Available	Available
Licensing	Available	Available	Available	Available
Permitting	Available	Available	Available	Available
Risk reduction decisions	Limited	Limited	Limited	Limited
Accident preparedness/response	Limited	Limited	Limited	Limited
Poisoning control	Available	Available	Available	Available
Emissions inventories	Limited	Limited	Limited	Limited
Inspections & audits (environment/health)	Limited	Limited	Limited	Limited
Information to workers	Limited	Limited	Limited	Limited
Information to the public	Limited	Limited	Limited	Limited

8.2 Location of National Data

Thanks to a fairly sound statistical system, all the items listed in the table are available in China. But the data are owned and controlled by different departments, and the management technology is backward. It is therefore very inconvenient to use these data. Advanced management technology, i.e. special agency and computer network management, should be adopted to facilitate full and effective utilization of data, so as to better serve the work of chemicals management. Table 8.2 gives the location of national data.

Table 8.2 Location of National Data

Type of data	Location(s)	Data source	Who can access?	How to gain	Formats
Production statistics	Various production departments, National Bureau of Statistics	Production enterprises, statistical bodies at various levels	People concerned, the public	Information services, publications, computer network	Documents, computer data
Import statistics	GAC	Customs at various levels	People concerned, the public	Information services, publications, computer network	Documents, computer data
Export statistics	GAC	Customs at various levels	People concerned, the public	Information services, publications, computer network	Documents, computer data
Chemical use statistics	SAPCI, Ministry of Agriculture	Departments in charge of petroleum and chemical industry as well as agriculture at various levels	People concerned	Information services	Documents
Industrial accident reports	SETC, related industrial departments	Industrial departments at various levels	People concerned	Information services	Documents
Transport accident reports	SETC, related department of communications	Departments in charge of communications at various levels	People concerned	Information services	Documents

Type of data	Location(s)	Data source	Who can access?	How to gain	Formats
Occupational health data (agricultural)	Ministry of Health, Ministry of Agriculture	Health and epidemic prevention stations and agricultural departments at various levels	People concerned	Information services	Documents
Occupational health data (industrial)	Ministry of Health, related State industrial administrations	Health and epidemic prevention stations and industrial departments at various levels	People concerned	Information services	Documents
Poisoning statistics	SAPCI, Ministry of Health	Health and epidemic prevention stations at various levels	People concerned	Information services	Documents, computer data
Pollutant release and transfer register	SEPA	Environmental protection agencies at various levels	The public	Information services	Documents
Hazardous waste data	SEPA	Environmental protection agencies at various levels	The public	Information services	Documents
Register of pesticides	SAPCI, Pesticides Testing Institute of the Ministry of Agriculture	Various producers and importers	People concerned	Information services	Documents
Register of toxic chemicals	SEPA Chemicals Registration Center, SAPCI, SPA	Various importers and exporters	People concerned	Information services	Documents

Type of data	Location(s)	Data source	Who can access?	How to gain	Formats
Inventory of existing chemicals	SEPA Chemicals Registration Center, SAPCI, State Pharmaceutical Administration	Various production enterprises, importers	The public	Information services, publications, computer network	Documents, computer data
Register of first imports	SEPA Chemicals Registration Center	Various importer	People concerned	Information services	Documents
Register of producers	SAPCI	Various production enterprises	People concerned	Information services, publications, computer network	Documents, computer data
PIC decisions	SEPA, Ministry of Agriculture	SEPA, Ministry of Agriculture	People concerned	Information services	Documents

8.3 Procedures for Collecting and Disseminating National/Local Data

The national statistical data include the production and import/export statistics of various types of chemicals. The production statistical data are gathered by the competent department of production and the National Bureau of Statistics (NBS) via reports from production enterprises to their superiors. The competent department of production and the NBS manage the data with computers. They also separately publish yearbooks for different users. Chemical import/export data are the actual figures of imports/exports through customs which are reported to the General Administration of Customs by various customs bodies. The GAC exercises computerized management of these data and publishes monthly reports. It also publishes a yearbook in both Chinese and English.

Chemicals registration includes toxic chemicals import/export register, first import of chemicals register, register of pesticides and register of the producers of toxic chemicals. Those who intend to import/export chemicals on the List of Toxic Chemicals Banned or Strictly Restricted in China must apply to the SEPA for toxic chemicals import/export environmental management registration. The relevant registration data are under the management and care of the SEPA Chemicals

Registration Center. Foreign business people or their agents who intend to export to China any of their chemicals (excluding pesticides) which have not been registered in China must apply to the SEPA for chemicals import environmental management registration. The related registration data are under the management and care of the SEPA Chemicals Registration Center. To produce and import pesticides (including the production of original pesticide, processing of preparations and split charging) in China, prior registration is required. Data concerning the chemical properties, toxicology, effect, residue, impact on environment and labeling of the pesticides should be furnished with the registration application. Such data are under the management and care of the Pesticides Testing Institute of the Ministry of Agriculture for use by the people concerned. In order to protect workers' health and the working environment, the production enterprises in the chemical industrial sector practice the toxic chemicals registration system. The first list of 50 types of toxic chemicals enjoying registration priority has already been published, as have The Rules on the Management of Toxic Chemicals. Chemical industrial enterprises are required to register the 50 types of toxic chemicals they produce, process, use and store according to the requirements of the "Toxic Substances Register," and carry out, according to the Declaration on New Toxic Substances, registration formalities for the chemical industrial products developed after these Rules went into effect. Computerized data collection is done separately by the different provinces, autonomous regions and municipalities directly under the Central Government on the basis of registration, in order to ensure effective management of the production of toxicants. After they have registered their toxic chemicals, enterprises hang an MSDS at each site exposed to poison to help workers understand the characteristics of the poisons, avoid poisoning and facilitate first-aid treatment after poisoning.

A strict reporting system has been established for industrial and transportation accidents involving toxic substances. It is required that all industrial fire, explosion, leakage, poisoning and transportation accidents involving toxic substances should be immediately and accurately reported to the authorities at the higher level. If the case is very serious, the State will organize rescue. The reports are to be made to different competent departments.

The Ministry of Health is responsible for people's health. The health and epidemic prevention stations, and institutions of labor hygiene and occupational disease prevention and control at various levels are responsible for the supervision and control of agricultural and industrial occupational health and poisoning accidents caused by environmental pollution; investigation into detriments to health; collection of data and analyses concerning occupational health; rescuing of poisoning victims; and the collection and statistical analysis of poisoning data and reporting such to the Ministry of Health. They are also responsible for dealing with public poisoning cases and collection of poisoning data, and reporting such to the Ministry of Health.

The State Environmental Protection Administration initiated the declaration and registration of solid wastes in 17 cities of the country in 1991. Building on this work, the solid wastes declaration and registration was carried out nationwide in

1995. This project has been completed, and all registration data have been put under computerized management. The SEPA and the State Administration of Petroleum and Chemical Industry have completed the List of Chemical Substances Available in China. The list records more than 20,000 types of chemical substances, and is available in printed form, as well as on CD-ROM and on the Internet.

The Chinese Government strictly implements the PIC procedures. The SEPA is responsible for the updating of data on chemicals import and export, and the Pesticides Testing Institute of the Ministry of Agriculture is responsible for the updating of data on pesticides import and export.

8.4 Availability of International Literature

International literature on chemicals safety is available mainly at such organizations as the China Environmental Science Research Institute, Chinese Academy of Preventive Medical Science, Pesticides Testing Institute of the Ministry of Agriculture, Shanghai Toxic Chemicals Information Service Center, Institute of Safety Engineering of the China Petrochemical Industry Group Co., and the Institute of Environmental Protection of the Beijing Institute of Chemical Industry. International literature is sent to these organizations by international organizations or purchased from abroad. Due to changes in the institutions and personnel possessing international data, loose contact or lack of contact with international organizations, some international literature is out of date or incomplete in China, affecting its utilization. Language is another problem significantly affecting the direct use of international literature.

Some important items of international literature have been translated into Chinese for government administrations or published in book form for use by the public. Some translated materials have been published in periodicals. The public gains access to international literature mainly through books, magazines, information services or the Internet. Table 8.3 shows the availability of International Literature, and Table 8.4 shows the availability of international data bases.

Table 8.4 Availability of International Databases

Database	Location(s)	Who has access?	How to gain access
IRPTC	CAPMS SEPA Chemicals Registration Center	Public	Information service
IPCS INTOX	CAPMS	Public	Information service
CAS	China Chemical Industry Information Center	Public	Information service

RTECS	CAPMS SEPA Chemicals Registration Center	Public	Information service
CHEMINFO	CAPMS Shanghai Toxic Chemicals Information Service Center Qingdao Chemical Industry Safety and Health Information Center	Public	Information service

Table 8.3 Availability of International Literature

Literature	Location(s)	Who can access?	How to gain
Environmental Health Criteria Documents (WHO)	Chinese Academy of Preventive Medical Science (CAPMS) SEPA Chemicals Registration Center	Public	Information service
Health and Safety Guides (WHO)	CAPMS	Public	Information service
International Chemicals Safety Data Cards (IPCS/EC)	SEPA Chemicals Registration Center Institute of Environment Protection of the Beijing Institute of Chemical Industry	Public	Information service
Decision Guidance Documents for PIC Chemicals (FAO/UNEP)	SEPA Chemicals Registration Center Pesticides Testing Institute of the Ministry of Agriculture	Public	Information service
FAO/WHO Pesticides Safety Data Sheets	CAPMS Pesticides Testing Institute of the Ministry of Agriculture	Public	Information service
Documents from the FAO/WHO Joint Meeting on Pesticide Residues	CAPMS Pesticides Testing Institute of the Ministry of Agriculture	Public	Information service
Material Safety Data Sheets (industry)	Qingdao Institute of Science on Chemical Industry Labor Protection	Public	Information service
OECD Guidelines for the Testing of Chemicals	SEPA Chemicals Registration Center	Public	Information service
Good Laboratory Practice Principles	SEPA Chemicals Registration Center	Public	Information service

Literature	Location(s)	Who can access?	How to gain
WHO/UNEP Global Env. Library Network	CAPMS SEPA Chemicals Registration Center	Public	Information service

Chapter 9: Technical Infrastructure

9.1 Overview of Laboratory Infrastructure

China boasts a great number of chemical research institutes affiliated to the SEPA, Ministry of Health, Ministry of Agriculture and State Administration of Petroleum and Chemical Industry. They are the technical backup for the management of chemicals.

Those affiliated to the SEPA include the China Environmental Science Research Institute, China National Environment Monitoring Station, Sino-Japanese Friendship Environmental Protection Center, the SEPA Chemicals Registration Center, the SEPA Nanjing Institute of Environmental Science, the SEPA South China Institute of Environmental Science, Shenyang Institute of Environmental Science, and relevant provincial and municipal institutes of environmental science and monitoring stations. They undertake the following tasks: prevention and control of environmental pollution, formulation of environmental standards and norms, registration of chemicals, testing of environmental pollutants, studies on the biological toxicology of chemicals, environmental monitoring and analysis of pesticide residues. They have some special laboratories, including the key laboratory for studying chemical testing technology, to make analyses of and carry out tests on chemicals and research the biological toxicology of chemicals.

Those affiliated to the Ministry of Health include the Environmental Health Monitoring Institute, Institute of Environmental Health and Health Engineering, Institute of Industrial Health and Occupational Diseases, Institute of Nutrition and Food Hygiene and Institute of Food Hygiene Supervision and Testing under the Chinese Academy of Preventive Medical Science, as well as provincial and municipal health and epidemic prevention stations and institutes of industrial health and occupational disease prevention and control. They have special-purpose chemical analysis laboratories and toxicology laboratories to engage in the toxicology research of chemicals, pesticides and cosmetics as well as in the testing of chemical pollutants and research on the prevention and control of poisoning. Besides, the Ministry of Health has also under it the four institutes of the Chinese Academy of Medical Sciences — the Medicines Institute, Institute of Medical Biotechnology, Institute of Medicinal Herbs and Medicines Testing Institute, as well as various provincial and municipal medicines testing institutes to carry out pharmacological and chemical analyses of medicines.

Those affiliated to the Ministry of Agriculture include the Pesticides Testing Institute, Environmental Protection Institute, China Veterinary Medicines Supervision Institute and Institute of Soil and Fertilizers of the Chinese Academy of Agricultural Sciences, as well as various provincial and municipal pesticides testing institutes. They engage in studies on pesticide effects, chemical properties and residues.

Those affiliated to the State Economic and Trade Commission and the State Administration of Petroleum and Chemical Industry include the key State Explosion Safety Laboratory, the Safety Engineering Research Institute of the China Petrochemical Industrial Group, Shanghai Toxic Chemicals Information Service Center, Environmental Protection Institute of the Beijing Chemical Industry Research Institute and Shenyang Chemical Industry Research Institute, as well as various provincial and municipal industrial health and occupational disease prevention and control institutes. Their tasks involve chemical testing, pollutant testing, pesticide development and research, new medicine safety assessment, research on environmental toxicology, prevention and control of occupational diseases in the chemicals industry and research into legislation and policies concerning chemicals management.

The Ecological Environment Research Center of the Chinese Academy of Sciences is also an important institution engaging in chemical research. The center is provided with a key State laboratory for environmental water chemistry and an open laboratory for environmental analytical chemistry and ecological toxicology. They carry out research on water chemistry, the impact of chemical substances on the environment in dynamic conditions, and analysis of transient states and new chemical forms of intermediate products, as well as on the transportation of chemical substances (including micro-pollutants), and their ecological toxicity and related analytic chemistry. The Aquatic Organism Institute of the Chinese Academy of Sciences is an important research institute concerning the toxicology of chemical hydro-organisms. It also engages in the study of the aquatic ecological environment.

Of the more than 1,000 universities in China, many serve as technological support for the management of chemicals. In additional to their routine teaching assignments, they contribute to the analysis and testing of chemicals, environmental protection, research on toxicology, control of poisoning and research on legislation and policies concerning chemicals management.

Table 9.1 gives an overview of the laboratory infrastructure of regulatory chemical analysis.

9.2 Overview of Government Information Systems/Computer Capabilities

The SEPA has a national toxic chemicals data base and a data bank containing a list of chemicals available now in China. The toxic chemicals data base contains the whole data of IRPTC and the data base on the toxic effects of chemical substances (USA).The Environmental Health Monitoring Institute under the Chinese Academy of Preventive Medical Science has established a poisoning information system and hazardous chemicals information system. It has also imported from the US a data base on the toxic effect of chemical substances and one on hazardous substances. The toxic chemicals information data bank established by the Shanghai Toxic Chemicals Information Service Center consists of a principal system and a

subsystem. The principle system is the imported data base on the toxic effect of chemical substances, while the subsystem contains the United States Coast Guard chemical hazard emergency information system of the US Department of Transportation, the data base for technical assistance concerning oil products and hazardous substances of the US Environmental Protection Agency, and three data banks on poisoning and first-aid, standards and legislation, and safety programmed by the center itself. The chemical industry safety data bank of the Safety Engineering Research Institute of the China Petrochemical Industry Group Co., consists of imported TRADE NAMES, CHEM INFO, TDG, RIPP, CISISO and the document data base of NIOSH (USA), as well as four Chinese data banks developed by the institute itself — making approximately 10 million items of data about 100,000 types of chemicals available. The four Chinese data banks deal with hazardous chemicals handling safety and emergency leakage treatment.

Table 9.1 Overview of Partial Laboratory Infrastructure Available for Regulatory Chemical Analysis

Name/Description of Laboratory	Loca-tion	Equipment/Analytical capabilities available	Accredita-tion (if yes, by whom)	Certified GLP* (yes/no)	Purpose
State Key Laboratory for Environmental Protection Chemicals Testing Technology	Beijing	Ion emitters including chromatography-mass spectrograph and inductive coupling, polyelement atomic absorption photometer, liquid chromatography, gas chromatography, ultraviolet-visible spectrophotometer, fluorospectro photometer, automatic water analysis meter, continuous BOD analyzer, continuous COD analyzer, TOC analyzer	(Under construction)	(Under cons-truction)	Physical and chemical testing of chemicals, biological effect testing, accumulation degradation testing, health effect testing

Name/Description of Laboratory	Loca-tion	Equipment/Analytical capabilities available	Accredita-tion (if yes, by whom)	Certified GLP* (yes/no)	Purpose
Environmental Health Monitoring Institute of the CAPMS	Beijing	Ion mass-spectrometers including electron coupling, high-efficient liquid chromatography, gas mass spectrum combined analytical instrument, atomic absorption spectrophotometer, ultraviolet spectrophotometer, SPE tester, gas chromatography, ionic chromatography atomic fluorospectro photometer	State Bureau of Quality and Technical Supervision (SBQTS)	Yes	Determining chemical substances in drinking water, air and cosmetics
Institute of Environmental Health and Health Engineering of CAPMS	Beijing	High-voltage liquid chromatography, atomic absorption spectrograph, flame atomic absorption spectrograph, graphite stove atomic absorption spectrograph, gas chromatography, ionic chromatography, fluorospectro photometer	SBQTS	Yes	Determining chemical substances in drinking water and air
Institute of Labor Hygiene and Occupational Diseases of CAPMS	Beijing	Liquid chromatography, atomic absorption spectrograph, gas chromatography, ionic chromatography, fluorospectro photometer	SBQTS	Yes	Determining hazardous substances, various poisoning substances and pesticides at the workplace

Name/Description of Laboratory	Loca-tion	Equipment/Analytical capabilities available	Accredita-tion (if yes, by whom)	Certified GLP* (yes/no)	Purpose
Institute of Nutrition and Food Hygiene of CAPMS	Beijing	Liquid chromatography, atomic absorption spectrograph, gas chromatography, ionic chromatography, fluorospectro photometer	SBQTS	Yes	Determining hazardous substances and pesticides in food
Institute of Food Hygiene Supervision and Testing of CAPMS	Beijing	Liquid chromatography, atomic absorption spectrograph, gas chromatography, ionic chromatography, fluorospectro photometer	SBQTS	Yes	Determining hazardous substances and pesticides in food
Pesticides Testing Institute of the Ministry of Agriculture	Beijing	Liquid chromatography, atomic absorption spectrograph, gas chromatography, ionic chromatography, infrared spectrometer, ultraviolet spectrometer, visible spectrophotometer, gas mass spectrum combined analytical instrument, gas AED tester	SBQTS	Yes	Determining pesticides
State key Laboratory for Explosive and Safety Science	Beijing	Blasting detonator, seismic detector, acceleration calorimeter, computer platform	State Economic and Trade Commission	Yes	Explosive analogy and counter-measure studies

*GLP: Good Laboratory Practice

Since computers were applied to chemicals research in China in 1986, a national computer network comprised of four backbone nets has taken shape. The

four backbone nets are Chinanet, CERnet (China Education and Research Net), CSTnet (China Science and Technology Net) and ChinaGBN (China Golden Bridge Net). They are connected with special networks in hundreds of cities and dozens of State departments. Today, domestic subscribers to these four networks can have direct access to the Internet. The Chinese Government launched the on-line project on January 22, 1999. Governments at various levels have since developed their own networks by using original resources and continuing input. By the end of 1999, about 60 percent of the central government departments had linked up with the Internet. A total of 41 State Council institutions have set up their own websites on the Internet, which are accessible to the public. They include the SEPA, Ministry of Agriculture, Ministry of Health, State Administration of Petroleum and Chemical Industry, State Economic and Trade Commission, General Administration of Customs and Ministry of Labor and Social Security. The SEPA Chemicals Registration Center and the Environmental Health Monitoring Institute of the Chinese Academy of Preventive Medical Science have also set up their own websites. These websites have published a great deal of professional information, which is available to the general public.

The SEPA and its subordinate units in Beijing, including the China Environmental Science Research Institute, Sino-Japanese Friendship Environmental Protection Center, China National Environmental Monitoring Station and Chemicals Registration Center, have been connected through computers.

9.3 Overview of Technical Training and Education Programs

Chemicals management technical training and education are closely associated with environmental education. It is a strategic task of China's environmental protection undertakings to promote education about the environment to enhance the nation's awareness of the importance of environmental protection and encourage the public to conscientiously participate in such efforts. The Chinese Government attaches great importance to environmental protection education.

China convened its first national environmental protection conference in 1973. The meeting put forward the following principles to guide the environmental protection campaign: "Overall and rational planning, comprehensive utilization, turning what are harmful into what are beneficial, and mass participation." These principles highlighted the importance of public participation in this work. Later, the State Council approved and transmitted the Report on the National Situation of Environmental Protection and the Rules for Protecting and Improving the Environment submitted by the State Planning Commission. The State Council's document clearly stipulated that "the institutes of higher learning concerned should offer specialties and courses in environmental protection to train technical personnel in this respect."

Over the following 20-odd years, a fairly sound environmental education system has taken shape, which involves leadership training, professional education,

on-the-job training, and middle and elementary school education.

(1) Leadership training. To teach and examine decision makers' knowledge of environmental protection are important means to enhance their awareness of the environment. In recent years, the Party School of the CPC Central Committee and some local Party schools have offered lectures on environmental protection knowledge. At each Mayors' Workshop held jointly by the Ministry of Construction, Organization Department of the CPC Central Committee and China Association for Science and Technology, courses including Strategies for Environmental Protection in China and Tackling the Urban Environment in A Comprehensive Way are available.

(2) Professional education. This includes higher, intermediate and vocational high school education designed to cultivate different grades of professionals and technicians, including Ph.D and master's degree holders, undergraduates, graduates of specialized colleges, and graduates of polytechnic schools. Environmental education started in the latter half of the 1970s, with only a few universities offering the specialty. But it developed rapidly in the 1980s. So far, various universities, colleges and polytechnic schools have supplied environmental protection agencies with about 10,000 graduates, easing the serious shortage of specialized professionals in those agencies.

(3) On-the-job training. The majority of people engaged in environmental protection in China are inexperienced, as they were transferred to the sector from other walks of life. Hence, it is an urgent task to improve their professional level and capability through on-the-job training.

At present, a person must pass an examination and obtain a certificate before getting a post in this sector. Statistics show that the environmental protection agencies at various levels have conducted nearly 10,000 training classes of various types over the past decade, at which some 400,000 people have received training.

(4) Middle and elementary school training. In 1979, the Chinese Society of Environmental Science convened the first meeting of the environmental education committee. Since then, environmental education for children has flourished.

(5) Support of the mass media, video products, movies and literature and art for environmental education. Since the late 1980s, the mass media have played a significant role in guiding the public's attention to the environment, disseminating environment-related scientific knowledge, legislation and policies among the public, and enhancing the public's awareness of environmental protection and their sense of participation. In additional to publishing positive reports, the press have also criticize different regions and departments. The number of video products, movies, and even pop songs concerning environmental protection has increased. With diversified themes and formats (including newsreels, feature films, scientific and educational films, special-subject films, art films and teaching films), serve to raise the public's awareness of the importance of the environment.

Environmental education has two fundamental tasks. One is to raise the nation's awareness of the environment, and the other is to cultivate professionals for

protecting the environment, including the improvement of the professional knowledge and skills of existing personnel in environmental protection posts. The general goal is to develop environmental education in a planned, all-sided and multi-layered way, and to readjust, enrich and improve professional education, develop on-the-job education, basic education and social education to enhance the environmental awareness of the whole nation, and that of the leadership in particular.

Chapter 10: International Linkages

10.1 Cooperation and Involvement with International Organizations, Bodies and Agreements

China is a member state of the United Nations. In order to protect human health and environment, the Chinese Government supports the work of relevant UN agencies. It has joined the World Health Organization, United Nations Environment Program (UNEP), International Register of Potentially Toxic Chemicals (IRPTC), Food and Agriculture Organization (FAO), International Program on Chemical Safety (IPCS), United Nations Industrial Development Organization (UNIDO) and International Labor Office (ILO). China is also a member state of the World Bank and Asian Development Bank. It has actively participated in the activities of all these international organization, fulfilled its obligations and carried out the corresponding tasks, making important contributions to the development of these organizations. China prepared the *China's Agenda 21— White Paper on China's Population, Environment and Development in the 21st Century*, promulgated the Regulations on the Environmental Management of First Import of Chemicals and the Import and Export of Toxic Chemicals, formulated the National Program on Gradually Eliminating Ozonosphere Depletion Substances in China, the Regulations Concerning Safety in the Use of Chemicals at Workplaces and the Rules on the Preparation of Technical Instructions on Chemicals Safety, and promulgated the Law on the Prevention and Control of Environmental Pollution Caused by Solid Wastes and the List of National Hazardous Wastes. China also reached an agreement with Japan concerning the destruction of chemical weapons abandoned by the Japanese in China during the Second World War. Table 10.1 lists the international organizations and activities China is involved in. Table 10.2 clarifies the involvement of China in international agreements/procedures.

10.2 Participation in Relevant Technical Assistance Projects

Multilateral Fund for the Implementation of the Montreal Protocol

The Chinese Government has applied for technical assistance to the World Bank, the United Nations Development Program, UNIDO and the multilateral fund for the implementation of the Montreal Protocol. The country received a donation of US$105.6 million for the 173 projects approved at the 19th executive committee meeting and previous meetings. For the 14 projects approved at the 20th executive committee meeting, China got a donation of US$18.3 million, US$1.06 million for the six projects approved at the 21st executive committee meeting, US$23.81 million for the 20 projects approved at the 22nd meeting, and US$62 million for the industrial mechanism projects approved at the 23rd meeting. In 1998, the donation

obtained totaled US$80 million.

Basel Convention

The World Bank has approved China's research project on the Basel Convention Action Plan, donating a total of US$300,000. The project, which has already been put into effect, will assist China in building up a legislation system for the management of solid wastes, as provided in the Basel Convention.

Table 10.1 Membership in International Organizations, Programs and Bodies

International organization/body/ activity	National focal point (Ministry/agency & primary contact point)	Other ministries/ agencies involved	Related national activities
IFCS	State Environmental Protection Administration	Ministry of Health, Ministry of Labor and Social Security, SAPCI	Coordination and implementation of IFCS tasks
UNEP IRPTC - national correspondent IE/PAC - cleaner production center	SEPA Chemicals Registration Center, CAPMS Environmental Health Monitoring Institute of the Ministry of Health, SEPA Cleaner Production Center	SAPCI	Information exchanges, participation in related activities, establishment of the State Cleaner Production Center to promote cleaner production among domestic enterprises
IPCS	Ministry of Health	SEPA	Information exchanges, participation in related activities, establishment of the Toxic Substances Control Center
WHO	Ministry of Health		Implementation of various tasks, participation in related activities
FAO	Ministry of Agriculture	Ministry of Health	Participation in related activities, information exchanges
UNIDO	Ministry of Foreign Trade and Economic Cooperation	SAPCI, SEPA, SETC	Participation in related activities, information exchanges

International organization/body/ activity	National focal point (Ministry/agency & primary contact point)	Other ministries/ agencies involved	Related national activities
ILO	SETC	Ministry of Health, SAPCI	Information exchanges, participation in related activities
INCB	State Drug Administration		Implementation of the convention on narcotics control
World Bank	Ministry of Finance		Participation in related activities
Regional development bank (e.g. Asian Development Bank)	Ministry of Finance		Participation in related activities

Table 10.2 Participation in International Agreements/Procedures Related to Chemicals Management

International agreements	Primary responsible agency	Related national implementation activities
Agenda 21 - Commission for Sustainable Development	Ministry of Science and Technology, SEPA	Preparing and implementing the *China Agenda 21 - the White Paper on China's Population, Environment and Development*
UNEP London Guidelines (PIC procedure)	SEPA	Issuing the Regulation on the Environmental Management of First Import of Chemicals and the Import and Export of Toxic Chemicals, data exchanges and national implementation
FAO Code of Conduct (voluntary procedure)	Ministry of Agriculture	Data exchanges and national implementation
Montreal Protocol	SEPA	Implementing the National Program on Gradually Eliminating ODS in China

International agreements	Primary responsible agency	Related national implementation activities
ILO Convention 170	SETC, SAPCI	Working out the Regulations on the Safety in Use of Chemicals at Workplace and the Rules for the Preparation of Technical Instructions for Chemicals Safety
UN Recommendation for the Transport of Dangerous Goods	Ministry of Communications	National implementation
Basel Convention	SEPA	Promulgating the Law on the Prevention and Control of Environmental Pollution Caused by Solid Wastes, and publishing the List of National Hazardous Wastes
London Convention	SEPA	National implementation
Chemicals Weapon Convention	State Chemicals Weapon Control Office (located in the SAPCI)	

Chapter 11: Awareness/Understanding of Workers and the Public

"Toxic chemicals" refers to chemicals which, after entering the environment, are detrimental to human health and the environment by means of environmental accumulation, bio-accumulation, bio-transfer or chemical reaction, or are seriously detrimental and potentially dangerous to the human body through exposure. When pollution caused by such chemicals as pesticides, organisms, waste water and gas becomes increasingly serious, and when disasters frequently caused by toxic substances constitute a serious threat to the environment, human and animal health and other benefiting organisms, people become increasingly concerned about toxic chemicals and realize that negligence at any link from production, storage and transport to the use of toxic chemicals will have a destructive effect on human health and the ecological environment.

The government has also realized, to a deeper extent, that mobilizing the public to participate in environmental protection activities and supervising the enforcement of environmental laws and regulations are essential prerequisites for the implementation of laws and policies for the protection of the environment and the realization of environmental protection goals. Attention has been paid to publicizing various types of environmental information, so that the public can keep abreast of the current environmental situation. The opinions of relevant public and mass organizations are solicited during the process of assessing the environmental impact of construction projects. The government also calls for immediate settlement of environmental issues reported by NPC deputies and CPPCC members at various levels, and exposure, through the mass media, of units or individuals who cause serious environmental pollution and damage by violating environmental laws and regulations, so as to raise the awareness of the whole people about the importance of controlling environmental pollution and improving the ecological environment. Pollution accidents are those accidents which, caused by economic and social activities and behavior in violation of environmental protection laws and regulations or by the influence of unexpected factors and unavoidable natural disasters, result in contamination of the environment, harm human health, or cause social or economic losses. The adoption of a pollution accident reporting system has enabled the government and related departments to immediately take preventive measures against pollution and the proliferation of such accidents, and enables units and residents threatened by pollution to take preventive measures. It helps the State, collectives and individuals to avoid or minimize property loss. In addition, the system creates conditions for finding out the causes, extent of damage and impact of accidents, and promotes the smooth handling of the consequences.

The State Council approved *China's Ten Countermeasures for the Environment and Development* and *China's Agenda 21* in 1992 and 1995, respectively. The implementation of *China's Agenda 21* is aimed at strengthening scientific and technical undertakings in the field of social development, promoting

harmonious development between the economy, society, population, resources and the environment, creating a sound natural and social environment, and stressing the rational development and utilization of the environment and resources, in order to reduce the number and extent of disasters.

China's Agenda 21 is also called the *White Paper on China's Population, Environment and Development in the 21st Century*. This document, proceeding from the country's specific national conditions in these three respects, stipulate China's overall strategy, measures and program of action for sustainable development. It is a guideline document for working out medium- and long-term plans for national economic and social development. The short-term objectives (1994-2000) put forward in *China's Agenda 21* are as follows: Urgent action should be taken to solve outstanding contradictions existing between the environment and development and to lay a solid foundation for long-term sustainable development, so that the environmental quality, living quality and resources status no longer deteriorate but improve partially while a proper economic growth rate is maintained. To strengthen the capacity for sustainable development is also a crucial short-term goal. The medium-term objectives (2000-2010) give priority to a series of sustainable development steps taken to change the mode of development and mode of consumption. The other medium-term objectives include improving administrative systems, economic industrial policies, technological systems and norms of social conduct which are applicable to sustainable development. The long-term objective (after 2010) is to restore and improve China's capability of regulating economic-social-ecological systems so as to develop economy and society within the capacity of environment and resources, and find a highly-efficient, harmonious and sustainable modernization road which suits China's national conditions, so as to make due contributions to the global process of sustainable development. The priority areas included in the priority projects programming framework of *China's Agenda 21* are: resources and environmental protection, global environmental issues, population control and social sustainable development, capacity building for sustainable development, sustainable development of industries and communications, agricultural sustainable development, and sustained energy production and consumption.

China's Agenda 21 advocates that "China should never slip back into the old rut of 'pollution first, treatment afterward' and 'destruction first, realignment afterward,' in order to achieve a sustainable economic and social development. It should build on existing conditions and on work in progress, and make full use of economic means and the market mechanism to promote sustainable development, and in the meantime striving to reach the goal of attaining economic growth, eliminating poverty and protecting the environment." Associating economic development and market competition with environmental protection is an important way to solve environmental issues and realize sustainable development. Realization of sustainable development for the whole of society depends on the joint efforts of every element of society, enterprises in particular. The ISO14001 Principle may help

enterprises to enhance their awareness of and impetus for environmental protection to achieve sustainable development by linking their environmental performance to their development and market competition. It is also very useful in the effective management and control of the areas which some environmental laws and regulations have difficulty covering, for instance, rational utilization of energy resources, collection and re-use of wastes, development of new environment-friendly products, and substitution of hazardous and auxiliary materials. This is a good supplement and improvement to China's existing chemicals management system.

Environmental science and technology systems of different types and disciplines have taken shape in China. Staffed by thousands of environmental scientists, they are an important force in China's environmental protection efforts. China will attach greater importance to the role of science and technology workers, and depend on scientific and technological advances to protect and improve the environment.

(1) Great efforts will be made in environmental technological research and development. Scientists and researchers will be organized to study and develop high-efficiency, low-consumption productive technology and technical equipment, develop pollution control technology and ecology recovery technology which suit the national conditions, strengthen research into and the spread of comprehensive resources utilization technology, and carry out collaborative research on key issues. In addition, the State will allocate annually a certain sum of research funds for research projects related to environmental management, while continuing to strengthen research into new environmental monitoring methods, technologies and equipment.

(2) Environmental protection policies shall be tested scientifically. During the process of formulating its environmental protection policy, China will organize specialists to test the necessity, feasibility and scientific quality of such a policy. To this end, the Environmental Protection Committee of the State Council and the SEPA jointly set up an advisory committee of experts in various specialties. To tap opinions from overseas experts and specialists in an extensive way, the China International Environment and Development Committee was established, with the approval of the State Council. The committee has undertaken some monographic studies and worked out a consultancy plan. These activities are conducive to the formulation of policies promoting harmonious development between the environment, the economy and society.

(3) Technical consultation and services concerning environmental protection will be further carried out. At present, there are only a few professional environment-related consultancy companies in China, operating on a very small scale and provided limited services. With the deepening of the reform and opening-up drive, more such companies will be established to serve society and facilitate the transformation of environmental protection technology into actual environmental and economic benefits.

The industrial and commercial sectors of the economy are the two major

sources of environmental pollution. China will adopt effective measures to make the two sectors fulfill their responsibilities and obligations in terms of environmental protection.

(1) The State will give aid to the enterprises using water and energy-saving technology and equipment and the technology and equipment generating less or no wastes, and encourage the adoption of environment-friendly technology to carry out clean production. The State bans projects which consume a great deal of resources and energy, are technologically backward and cause serious environmental pollution.

(2) China pays attention to the environmental impact of products and will launch an "environmental sign" campaign at the proper time. Enterprises are encouraged to produce environment-friendly products, and the public are encouraged to buy products with "environmental labeling". "Green food" and "organic food" campaigns are now underway in China, stressing environment-friendly technology to produce and process food, vegetables, fruits and livestock products.

(3) The State also encourages enterprises to engage in environmental protection, and ensure that they control pollution, by formulating standards and extending economic incentives.

(4) China will gradually formulate quality standards for environmental protection products, standardize environmental protection equipment, promote the production of related equipment, and improve the quality of environmental protection products, for which quality testing centers are being established in a planned way.

In order to better coordinate and promote the role of industrial and commercial circles in environmental protection, the Chinese Government has approved the establishment of the China Environmental Protection Industry Association, a non-governmental organization.

Efforts will be made to enhance enterprises' self-discipline and awareness of law observation, promote the rigid enforcement of environmental legislation and management systems, and the implementation of clean production. The Environmental Protection Law stipulates that during their production activities, enterprises must observe the relevant laws, regulations, standards, systems and administrative requirements for pollution control, and reach the State standards for waste discharge and environmental impact assessment. The establishment of the ISO14001 environmental management system will help enterprises to meet these requirements. Targeting management, ISO14001 covers a wide range, including control of pollutants and pollution sources, rational utilization of resources and energy, control of both generated and potential environmental factors, control of environmental factors caused by enterprises themselves, and rational exertion of influence on other related aspects. The management mode of ISO14001 embodies the idea of clean production and controls the whole process of production. As a result, clean production means fulfilling the requirements of ISO14001.

On October 22, 1994, the 10th meeting of the eighth NPC Standing Committee adopted a resolution on joining ILO Convention No. 170. To fulfill the

obligations of the convention, the Ministry of Chemical Industry and Ministry of Labor jointly formulated the Regulations on the Safety in Use of Chemicals at Workplaces. They also worked out the Regulations on the Preparation of Technical Safety Instructions for Hazardous Chemicals (GB 16483-96). These State standards have been disseminated among chemical industry enterprises and workers, educating them in the harm that can result from exposure to chemicals and make them take safety precautions.

In addition, major enterprises in the chemicals industrial sector are carrying out the “responsible care” activity, which aims to channel the sense of environmental protection into various links of production and management and inculcate an attitude of industrial self-discipline.

Chapter 12: Resources Available and Needed for Chemicals Management

12.1 Resources Available in Government Ministries/Institutions

China is a large country with a vast stretch of territory and a large population. The chemical industry is one of the country's basic industries, holding an important position in the national economy. There is a great variety and large quantity of chemicals in China, which leads the world in the production and consumption of some types of chemicals. As the composition of some chemicals is detrimental to the environment and human health, scientific management of them is required. This involves a number of departments and branches of learning. These departments include environmental protection, health, labor, trade, the petroleum and chemicals industries, communications/transport, administration of industry and commerce, public security, technical supervision and customs. The departments of environmental protection, health, agriculture and the petroleum and chemical industries are the major government departments in charge of the management of chemicals. Some institutions which are affiliated to these departments are also engaged in chemicals management. There is a division of labor between these departments and institutions, but they also cooperate with each other. China's administrative system is divided into central and local levels, i.e. the ministries and commissions at the central level, and provincial, municipal, prefectural and county administrations at the local level.

Along with the nation's constant social progress and economic development, the State has promulgated many laws and regulations concerning the management of chemicals, and the management system is being constantly improved. The State has invested a huge sum in cultivating specialists and managerial personnel, boosting the manpower of administrative institutions at all levels. The professional staff involved specialize in environmental protection, chemistry, health, pesticides and medicine. Unfortunately, there are no statistics on the exact input and possession of financial resources in chemical management. Table 12.1 provides an estimate of resources available to government ministries/institutions.

12.2 Resources Needed by Government Institutions to Fulfill Responsibilities Related to Chemicals Management

Government institutions need various types of professional skills, especially specialists in environmental protection, health and chemistry who have higher-education backgrounds and sound working experience. There are quite a number of such professional involved in chemicals management, but the number so far is insufficient and cannot meet the demand for national development. In addition, the existing professional staff need further training to improve their management

skills and update their knowledge. Priority should be given to strengthening training in risk assessment and control, emergency responses, chemical analysis, toxicology and legal knowledge. Table 12.2 shows an estimate of resources needed by government institutions to fulfill their responsibilities related to chemicals management.

Table 12.1 Resources Available in Government Ministries/Institutions

Ministry/ agency concerned	Number of professional staff involved	Type of expertise available	Financial resources available (per year)
Environment protection	1,000	Chemicals management, ecological toxicology, chemical analysis, supervision, environmental engineering, biology	
Health	1,500	Chemicals management, toxicology, pharmacology, pharmacy, hygienics, chemical analysis, supervision, environmental engineering, biology	
Agriculture	500	Pesticides, ecology, chemical analysis, plant protection, management of pesticides	
Economy and Trade	1000	Chemical management, assay, safety, and occupational health	
Petro-chemical industry	5000	Chemicals production, processing and research and development, safety and health, chemical analysis, supervision	
Communica-ti ons	100	Chemicals safety, chemical analysis	
Railway	60	Chemicals safety, chemical analysis	
Civil aviation	40	Chemicals safety, chemical analysis	
Public security	200	Chemicals safety, chemical analysis, management of highly toxic substances	
Customs	100	Chemicals safety, chemicals management	
Industry/ commerce	100	Chemicals safety, chemicals management chemical analysis, supervision	
Quality and technical supervision	500	Chemicals safety, chemicals management, chemical analysis, supervision	

Table 12.2 Resources Needed by Government Institutions to Fulfill Responsibilities Related to Chemicals Management

Ministry/agency concerned	Number/type of professional staff needed	Training requirements
Environmental protection	5,000 (chemicals management, ecological toxicology, chemical analysis, supervision, biology)	Risks assessment and management, risks reduction, improvement of supervisory capability, accident response, chemical analysis, control of chemicals pollution, ecological toxicology, laws
Health	1,500 (chemicals management, toxicology, hygienics, chemical analysis, supervision, biology)	Risks assessment and management, risks reduction, improvement of supervisory capability, poisoning control, chemical analysis, poisoning management, toxicology, environmental epidemiology, laws
Agriculture	1,000 (ecological environment, plant protection, management of pesticides, pesticide residue, pesticide poisoning, chemical analysis)	Risks assessment and management, risks reduction, pesticide poisoning, plant protection, chemical analysis, management of pesticides, laws
Labor	1,000 (labor safety, supervision and management, chemical analysis)	Labor safety, supervision and management, analytical chemical
Trade	1,000 (chemicals safety, chemical analysis)	Storage safety, chemical analysis
Petro-chemical industry	1,000 (chemicals safety, production management, chemical analysis)	Production safety, chemicals safety, chemical analysis, workers' health protection, prevention against poisoning
Communications	1,000 (transportation safety, chemical analysis)	Transportation safety, dangerous goods, chemical analysis, management of transportation
Railway	1,000 (transportation safety, chemical analysis)	Transportation safety, dangerous goods, chemical analysis, management of transportation

Ministry/agency concerned	Number/type of professional staff needed	Training requirements
Civil aviation	1,00 (transportation safety, chemical analysis)	Transportation safety, dangerous goods, chemical analysis, management of transportation
Public security	1,000 (chemicals safety, chemical analysis)	Management of combustible and explosive substances, management of highly toxic substances
Industry/ commerce	1,000 (chemicals management, chemical analysis)	chemicals management, chemical analysis
Technical supervision	1,000 (supervision and management, chemical analysis)	supervision and management, chemical analysis

Postscript

The National Mini-Profile for Sound Management of Chemicals was prepared in accordance with the spirit of the memorandum signed between the State Environmental Protection Administration and the United Nations Institute for Training and Research as well as the Guidance Document of UNITAR for Preparing a National Profile to Assess the National Infrastructure for Management of Chemicals. The Mini-Profile gives an overview of chemicals production, use, import and export as well as the disposal of wastes in China. It also lists Chinese laws, regulations and standards concerning chemicals management, and describes the responsibilities of various government departments as well as the activities of social institutions and organizations. It is the first national profile China has to assess the national infrastructure for sound management of chemicals. Its publishing will facilitate the management of chemicals in China, facilitate the coordination and cooperation between various departments in this regard and promote international exchanges and cooperation.

The Mini-Profile collects information and data from various government departments concerned. Supports from various walks of life for the completion of the Profile are greatly appreciated.

During the preparation of the Mini-Profile, Cui Muyao with the Bureau of Work Safety under the State Economic and Trade Commission, Su Zhi with the Department of Health Supervision under the Ministry of Health, Ning Minghui with the Department of Planting Administration under the Ministry of Agriculture, Sun Shubao with the Department of Policies, Laws and Regulations and Tan Husen with the Department of Foreign Affairs under the State Administration of Petroleum and Chemical Industry gave their whole-hearted support. Zhang Liwei, Deputy Director-General of the Pollution Control Department under the State Environmental Protection Administration paid close attention to the progress of the preparation work. Wang Ji and Zang Wenchao with the Pollution Control Department and Yue Ruisheng with the Department of International Cooperation under the State Environmental Protection Administration organized the preparation of the Mini-Profile. The preparation also involved personnel from the Chemicals Registration Center of SEPA, the Institute of Environmental Health Monitoring under the Chinese Academy of Preventive Medical Science, the Computer Network Center of Chemical Industrial Policymaking Information under the China Chemical Industry News, and the Institute for the Control of Agrochemicals under the Ministry of Agriculture. We would like to express our appreciation of their great contribution to the profile.

Finally, we take this opportunity to extend our thanks to UNITAR for its financial aid to the preparation of the Mini-Profile and also to Mr. Zhang She Can with the GTZ Company of Germany for his support.

Editor