## OVERVIEW OF THE PRINCIPAL ISSUES AND THEMES

In the border region, rapid industrialization and the associated population increase have created a need for improved hazardous and solid waste management infrastructure. Some of the specific waste issues that have been identified by the general public, as well as federal and state agencies, include the illegal transboundary shipment of hazardous waste; improper disposal of hazardous and solid waste; health and environmental risks posed by inactive and abandoned sites; the need for proper development of new sites; and the proper operation and closure of existing sites.

The following sections will discuss (1) the objectives of the Hazardous and Solid Waste Workgroup and progress toward goals, (2) environmental indicators of the binational Hazardous and Solid Waste Workgroup, (3) other notable activities and achievements, and (4) future perspectives.

**Hazardous and Solid Waste**

### The Growth of the Maquiladora Industry

The pace of industrialization and population growth in the border region is most clearly illustrated by the growth of the *maquiladora* industry.

**MAQUILADORAS *are foreign-owned or -operated assembly plants that import raw materials into Mexico and assemble finished products, primarily for export.***

According to Mexico's *Instituto Nacional de Estadística, Geografía, e Informática* (INEGI, or National Institute of Statistics, Geography, and Information), in January of 1993, there were 2,078 *maquiladoras* in Mexico. By January 1999, that figure had risen by more than 50 percent to a total of 3,143 in all of Mexico (Figure 9-1). In the same period, the number of *maquiladora* employees doubled, from approximately 515,000 to 1,060,000 (Figure 9-2 on the following page). The significance of this growth for border hazardous and solid waste issues is particularly great, given that approximately 80 percent of *maquiladoras* are located in the border states.

## OBJECTIVES OF THE HAZARDOUS AND SOLID WASTE WORKGROUP AND PROGRESS TOWARD GOALS

Annex III of the *La Paz Agreement* calls for cooperation between the U.S. and Mexico on issues of hazardous and solid waste.[1] The Hazardous and Solid Waste Workgroup was established in the Border XXI Program in response to the *La Paz Agreement*. The workgroup's principal goal is to create and implement programs to improve waste management capabilities on both sides of the border. Following are the objectives of the Hazardous and Solid Waste Workgroup and the progress made in implementing those objectives (Table 9-1 on the following page).

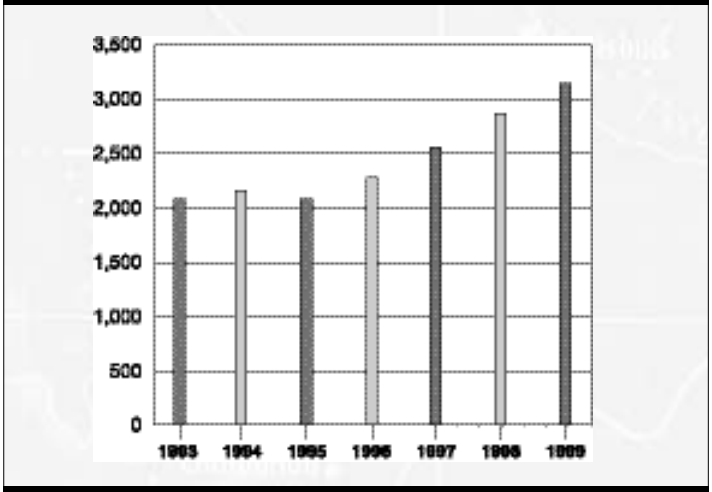
### Progress Toward Goals

**Develop a Vulnerability Atlas for the U.S.-Mexico Border to Target Geographic Priorities for Solid and Hazardous Waste Management Activities**

The vulnerability atlas is considered to be a regulatory tool to assist government and industry in the evaluation of sites in Mexico under consideration for the installation of hazardous waste management infrastructure.

**Growth of Maquiladoras**

**1993–1999**



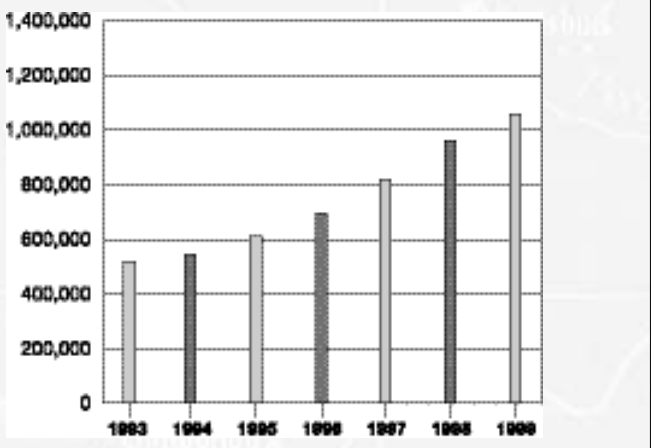

Data for January of each year
Source: Twin Plant Guide produced by SOLUNET: Infomax, Inc.

***Figure 9-1***

[1] The Agreement between the United States of America and the United Mexican States on Cooperation for the Protection and Improvement of the Environment in the Border Area was signed in La Paz, Baja California Sur, Mexico on August 14, 1983, and entered into force on February 16, 1984.

**Increase in Number of** Maquiladora **Employees**

**1993–1999**




Data for January of each year.
Source: Twin Plant Guide produced by SOLUNET: Infomax, Inc.

***Figure 9-2***

**Objectives**

- Develop a vulnerability atlas for the U.S.-Mexico border to target geographic priorities for solid and hazardous waste management activities.
- Improve monitoring of the transboundary movement of hazardous wastes and substances in the border region.
- Continue enforcement activities related to illegal hazardous waste practices.
- Improve waste management practices and promote solid and hazardous waste minimization and recycling.
- Build institutional expertise and capability.

The objectives listed above may have been paraphrased from the *1996 U.S.-Mexico Border XXI Program: Framework Document (Framework Document)*. For a more detailed description of the objectives, please refer to that report.

The objectives described in this section may be referred to by number. The numbers are intended for ease of reference only and do not imply order of importance.

***Table 9-1***

## Improve Monitoring of the Transboundary Movement of Hazardous Wastes and Substances in the Border Region

Currently, two systems are used to track movement of hazardous waste in the U.S. and Mexico. Each of the systems, the Hazardous Waste Tracking System (HAZTRAKS), and the *Sistema de Rastreo de Residuos Peligrosos* (SIRREP, or Hazardous Waste Tracking System), is discussed below.

- **Hazardous Waste Tracking System** – Over a three-year period, the U.S. Environmental Protection Agency (EPA) and the *Instituto Nacional de Ecología* (INE, or National Ecology Institute) have operated HAZTRAKS jointly. The system captures the information contained in INE's export authorizations and EPA's uniform hazardous waste manifests. Over the three years, the system and the user manuals have been updated periodically. EPA provided training for users in the border state branch offices of the *Secretaría de Medio Ambiente, Recursos Naturales, y Pesca* (SEMARNAP, or Secretariat of Environment, Natural Resources, and Fisheries) as well as the offices of U.S. state environmental agencies. Information from the HAZTRAKS data base is available to the public on EPA's HAZTRAKS web site at *www.epa.gov/earth1r6/6en/h/haztraks/haztraks.htm*.
- ***Sistema de Rastreo de Residuos Peligrosos*** – In a parallel effort in 1997, INE began developing SIRREP. The system uses the *Aviso de Retorno* (Notice of Return), instead of the previously used export authorizations, with respect to waste generated by the *maquiladora* industry. The system replaces the HAZTRAKS system in the Mexican agencies involved, although the exchange of information between INE and EPA will continue because information from the two systems is compatible. Operation of SIRREP began in November 1998 in the SEMARNAP branch offices in the northern border states, as well as at INE.

  SIRREP is currently in normal operation. However, it will continue to be modified, with the goal of adding greater functionality to the system. At present, the information sent by the SEMARNAP delegations in the border states is received monthly at INE's *Unidad de Sistemas e Informática* (Systems and Information Unit), which maintains a data base of the notices of return of hazardous wastes from the maquiladora industry in Mexico.

  It is worth noting that a 1999 study carried out for the Texas state legislature by the Texas Natural Resources Conservation Commission (TNRCC) determined that the operation of the SIRREP and HAZTRAKS systems is the most effective way of tracking the movements of hazardous wastes between the two countries.
- **Notice of Return for the *Maquiladora* Industry in the Border Region** – To strengthen the oper-

ation of SIRREP in the delegations of SEMARNAP and the Procuraduría Federal de Protección al Ambiente (PROFEPA, or Mexico's Federal Attorney General for Environmental Protection) in the border states, INE developed, and published on November 4, 1998, the Procedimiento Administrativo para el Retorno de los Residuos Peligrosos Generados por la Industria Maquiladora (Administrative Procedure for the Return of Hazardous Wastes Generated by the Maquiladora Industry), or the Aviso de Retorno, to replace the export authorization form. The document will facilitate the exchange of information in electronic form among maquiladoras and delegations of SEMARNAP throughout Mexico.

• **Waste Code Correlation Dictionary** – To facilitate interpretation and management of waste classification as provided for in the regulations of Mexico and the United States, an electronic dictionary, available on CD-ROM from EPA, has been developed to correlate the waste codes of the two countries. This tool will be critical in enabling industry to better comply with U.S. and Mexican hazardous waste regulations and in assisting EPA and INE in binational waste-tracking efforts.

• **U.S.-Mexico Hazardous Waste Data Analysis** – The workgroup has completed a comparative analysis of U.S. and Mexican hazardous waste transport data and resolved significant discrepancies between the two data sets collected from HAZTRAKS and SIRREP. A comparison of the two countries' data for 1996 showed that, while the United States reported approximately 8,000 tons of waste imported from Mexico in 1996, Mexican data reported 72,000 tons for the same year. A careful analysis of the data has shown that this significant discrepancy was primarily the result of differences in the definition of hazardous waste in each country, as well as systemic differences in waste-tracking procedures. The workgroup is now able to correlate the two data sets with 95 percent accuracy and expects accuracy to increase as Mexico implements changes in its manifesting system (described above in the discussion of SIRREP).

With regard to the indicators that involve U.S. and Mexican data for waste transported across the border, it is important to note that there is a significant difference between the two nations' numbers. The discrepancy can be attributed largely to the difference between the U.S. and Mexican regulatory definitions of hazardous waste. More than half the volume of waste that Mexico classified as hazardous in 1997 was considered nonhazardous solid waste under U.S. regulations. Another factor contributing to the discrepancy is that the two nations' tracking systems have historically operated very differently. The Mexican tracking system has used projected quantities of hazardous waste shipped, while the U.S. manifest system uses actual quantities of waste shipped. A final factor that contributes to the difference is reporting errors, such as the entry of an incorrect facility name on the required paperwork.

### Continue Enforcement Activities Related to Illegal Hazardous Waste Practices

• ***Repatriation Guidelines for Illegally Exported/Imported Hazardous Waste*** – The *Repatriation Guidelines* are a written set of principles used by EPA and SEMARNAP to facilitate communication and coordination related to repatriation of hazardous wastes that have been exported or imported illegally. The guidelines have been used on only a few occasions, most significantly to repatriate two truckloads of waste with high levels of lead contamination illegally exported to Guerrero Negro, Baja California Sur by A&W Smelters and Refiners, Inc.

• **U.S. State Enforcement Programs at the Ports of Entry** – The U.S. state participants in the Hazardous and Solid Waste Workgroup play an active role in enforcement of the regulations governing transboundary movement of hazardous waste. Activities undertaken by the states in this regard include assistance to industry to help industry better comply with regulations and active inspection and enforcement programs.

As an example of this important work, in the past three years, California's Department of Toxic Substances Control (DTSC) and PROFEPA officials in Baja California have offered U.S. and Mexican industry eight bilingual compliance assistance workshops on import-export requirements and hazardous waste classification. In addition, Texas and California have active hazardous waste inspection programs at the ports of entry. The DTSC

program inspected almost 3,000 vehicles in 1998 for illegal shipments of hazardous waste. From September 1998 to September 1999, TNRCC carried out 88 multi-day inspection exercises at six different ports of entry along the Texas-Mexico border. The Arizona Department of Environmental Quality (ADEQ) has also initiated a surveillance and enforcement program for the transboundary movement of hazardous waste in the Arizona-Sonora border region. ADEQ has participated in several multi-agency interdiction efforts to monitor and identify environmental infractions at the port of entry in Nogales, Arizona.

**Improve Waste Management Practices and Promote Solid and Hazardous Waste Minimization and Recycling.**

A number of the projects described under this objective are also described in the chapter that discusses the activities of the Pollution Prevention Workgroup. Refer to that chapter for additional reporting on those projects.

- ***Red Mexicana de Manejo Ambiental de Residuos*** – As part of the strategy to build capacity for waste management in Mexico, INE has created the *Red Mexicana de Manejo Ambiental de Residuos* (REMEXMAR, or Mexican Network for the Environmental Management of Wastes). Under that structure, INE is creating intersectorial networks for the environmental management of wastes, or technical coordinating units, in each of the states.

REMEXMAR is a national effort to facilitate coordination among: (1) the waste-generating industry sector, (2) the government as the authority on this issue, (3) academic institutions, (4) organizations involved in technical and scientific activities or services related to waste management, and (5) social interest groups. The effort is currently coordinated by INE to promote waste minimization and integrated waste management.

REMEXMAR is a member of the Red Pan-Americana de Manejo Ambiental de Residuos (REPAMAR, or Pan-American Network for the Environmental Management of Wastes), which is based in Peru and is coordinated by the Pan-American Center for Sanitary Engineering and Environmental Sciences.

The problem of hazardous waste in the border region creates a need for establishing networks for the environmental management of wastes. The networks foster social responsibility through the participation and collaboration of diverse sectors in the design of intersectorial networks for the minimization and integrated management of hazardous wastes. The networks reflect local interests in a balanced fashion and present solutions to environmental problems related to wastes. It is also anticipated that the members of the networks will evaluate the waste situation in their areas and identify needs related to infrastructure and other issues.

In October 1998, the network for the state of Sonora was formed, and, in 1999, networks were formed in Coahuila, Tamaulipas, and Chihuahua. In 2000, networks are planned for Baja California and Nuevo León. EPA representatives on the binational Hazardous and Solid Waste Workgroup will be invited to participate in those networks. It is expected that, in the future, the technical units of the border states will take part in meetings of this workgroup.

- **Border Waste Wi$e** – The original San Diego-Tijuana Border Waste Wi$e Program, begun in 1995, was a partnership of government agencies, academic institutions, and the private sector from both sides of the U.S.-Mexico border, aimed at reducing manufacturers' generation of solid waste, with an emphasis on maquiladoras. The goals of the project were to provide waste reduction assistance to businesses in the short term and to increase industry's awareness of, and spark a lasting commitment to, waste reduction in the long term.

The solid waste work undertaken by the Border Waste Wi$e Program has been highly successful and has been lauded as a notable example of pollution prevention by the Good Neighbor Environmental Board (GNEB). This work has included: (1) performance of an analysis of the waste stream entering the Tijuana landfill; (2) conduct of 27 on-site waste reduction assessments; (3) development of training and information resources; and (4) conduct of an inventory of recyclers in the San Diego-Tijuana region. Further information about the solid waste reduction work carried out under this project can be found on the Border Waste Wi$e web site, at *www.borderwastewise.org*.

Spurred by the success of the first phase of the Border Waste Wi$e Program, which focused on solid waste, EPA, in partnership with the Industrial Environmental Association (IEA) and the Border Trade Alliance, is begin-

ning a second phase of work. The second phase, which will involve many of the members of the original Border Waste Wi$e Program partnership, will take a multimedia approach, encompassing hazardous waste, wastewater, and energy use. An important aspect of the second phase is the goal of sustainability. The program will assist companies in implementing pollution prevention recommendations. The IEA will collect fees based on the companies' cost savings. The fees will be used to seed a revolving fund at IEA, so that the program will be self-sustaining, rather than relying on EPA grant funds. Under that model, the workgroup hopes to create a lasting resource for industries in the San Diego-Tijuana region that wish to work toward pollution prevention.

• **Arizona-Mexico International Green Organization** – Begun in 1997 with an EPA grant to ADEQ, the Arizona-Mexico International Green Organization (AMIGO) aims to bring together industries in Arizona and Mexico to share ideas and technologies that reduce waste and pollution and increase profits, worker safety, and environmental health. During its initial phase, AMIGO was focused on the Nogales, Arizona-Nogales, Sonora area, with an emphasis on *maquiladoras* in Nogales, Sonora. AMIGO now boasts 28 members, ranging from *maquiladoras* to trade associations, and is expanding its geographic coverage to industry in the Yuma, Arizona-San Luis Río Colorado and Agua Prieta, Sonora areas. Binational work under the AMIGO program includes pollution prevention workshops, educational tours of member facilities to learn about pollution prevention in a hands-on setting, and an annual pollution prevention awards program.

• **California Department of Toxic Substances Control Pollution Prevention Workshops** – Since 1997, DTSC has worked in collaboration with PROFEPA and officials of the *Dirección de Ecología de Baja California* (Baja California Department of Ecology) to offer five workshops on pollution prevention for industry in the border region. These workshops have covered a variety of topics, including California's pollution prevention program, techniques for minimizing hazardous waste generation in the electronics industry, and reduction in the generation of volatile organic compounds.

**Build Institutional Expertise and Capability**

• **Sampling and Analysis Training** – Training focused on environmental sampling protocols, techniques, and legal requirements, has been provided to Mexican environmental officials in Mexicali, Baja California; Hermosillo, Sonora; and Nuevo Laredo, Tamaulipas. Representatives of U.S. states have contributed greatly to the binational training classes by serving as instructors and facilitators.

• **Training for U.S. and Mexican Customs Services** – U.S. state environmental agencies have provided numerous training opportunities to the U.S. Customs Service and its Mexican counterpart and other law enforcement officials throughout the border region. The training courses, focused on hazardous waste identification and safety procedures, are aimed at improving enforcement of regulations governing transport of hazardous waste and increasing the safety of law enforcement personnel and the public.

• **Municipal Solid Waste Work with the Border Environmental Cooperation Commission** – The EPA staff on the Hazardous and Solid Waste Workgroup review proposals for municipal solid waste projects that are under consideration by the Border Environment Cooperation Commission (BECC) for certification to advise EPA's representative on the BECC Board of Directors. In addition, EPA staff on the workgroup provide input into BECC and North American Development Bank (NADB) efforts to develop new solid waste-related programs. State agencies also work with the BECC and the NADB on solid waste efforts.

• **Hazardous Waste Site Management Training** – Between 1996 and 1998, EPA provided to Mexican environmental officials four training courses on the characterization and restoration of sites contaminated with hazardous wastes. The courses were offered in three Mexican border states and in Mexico City.

• **Consultative Mechanism between the United States and Mexico** – Through the Hazardous and Solid Waste Workgroup, Mexico obtained the necessary information for Mexico's *Grupo Intersecretarial sobre Confinamientos de Residuos Peligrosos en la Frontera Norte del País* (Intersecretarial Group on Hazardous Waste Disposal Sites on the Country's Northern Border) to follow the issues and address local concerns about such sites. In particular, the workgroup directed its efforts toward resolving issues

related to a proposed low-level radioactive waste site in Sierra Blanca, Texas. The commissioners of TNRCC decided to deny a permit for the construction of the site.

This example represents a significant advance in environmental cooperation on the border and underscores the need for binational consultative mechanisms to address issues of common interest to the two governments. In response to that need, in December 1999, the co-chairs of the Hazardous and Solid Waste Workgroup signed the *Consultative Mechanism for the Exchange of Information on New and Existing Facilities for the Management of Hazardous and Radioactive Wastes Within 100 Km of the U.S.-Mexico Border (Consultative Mechanism)*. The agreement calls for regular exchange of information about hazardous and radioactive waste disposal sites, as well as hazardous waste recycling, treatment, and incineration facilities. The sharing of information will ensure that each government will be fully informed of opportunities to review technical data being considered in facility permitting decisions. Information exchange also will help both governments consider the concerns of the public and build public confidence in decisions to establish needed waste management infrastructure in the region.

As part of the process created under the *Consultative Mechanism*, both countries have, for the first time, exchanged publicly available comprehensive lists of the hazardous and radioactive waste facilities located in the border region. The lists will be available on the Border XXI web site. In addition to reinforcing the commitment to binational environmental cooperation under the *La Paz Agreement* and Border XXI, the *Consultative Mechanism* complements domestic efforts of both countries to increase transparency in decision making to protect the health and environment of border communities.

• **Active Subworkgroups Established in All Five Border Regions** – Regional subworkgroups of the Hazardous and Solid Waste Workgroup have been established along the border. The subworkgroups meet jointly with the subworkgroups of the Cooperative Enforcement and Compliance Workgroup. Regions covered by the subworkgroups now include: California-Baja California; Arizona-Sonora; Texas-Chihuahua-New Mexico; Texas-Coahuila; and Texas-Nuevo León-Tamaulipas. The subworkgroups are made up of enforcement and regulatory agencies at the federal, state, and local levels.

The subworkgroups meet three to four times a year, facilitating coordination on a regional basis. The meetings provide a forum for addressing state, local, and tribal concerns related to hazardous and solid waste issues, including: (1) enforcement cases; (2) tracking transboundary hazardous waste shipments; (3) sharing information about hazardous waste facilities and other border issues; (4) inspecting hazardous waste shipments at U.S. Customs Service ports of entry; and (5) training environmental and law enforcement officials from both countries.

## ENVIRONMENTAL INDICATORS

**Types of Environmental Indicators**

| | |
|---|---|
| P | PRESSURE: ACTIONS OR ACTIVITIES THAT INDUCE PRESSURE ON THE ENVIRONMENT |
| S | STATE: ENVIRONMENTAL AND NATURAL RESOURCE QUALITY AND QUANTITY |
| R | RESPONSE: ACTIONS TAKEN TO RESPOND TO ENVIRONMENTAL AND NATURAL RESOURCE PRESSURES |

In 1997, the Hazardous and Solid Waste Workgroup published the seven binational environmental indicators discussed in this section.

To prepare the indicators, public meetings were held for discussion with state authorities, universities, and nongovernmental organizations in Tijuana; Hermosillo, Sonora; Ciudad Juárez, Chihuahua; Saltillo, Coahuila; Monterrey, Nuevo León; and Ciudad Victoria, Tamaulipas to gather the principal recommendations and develop the final indicators for the workgroup.

The workgroup has made significant progress on data availability for many of its indicators. In the *1997 United States-Mexico Border Environmental Indicators Report (1997 Indicators Report)*, the workgroup was able to provide direct data for only two of the indicators, with related data provided for some of the others. Further, in the first report, all the Hazardous and Solid Waste Workgroup indicators were listed as "indicators in progress." In this report, the workgroup provides direct data for almost all of the indicators. While the workgroup still does not have all the data needed for the indicators, it will provide at least partial data for each indicator.

As stated earlier, Mexico and the United States have reported significantly different amounts of hazardous waste transported across the border. Within the context of those data differences, following are the results of the indicators for the Hazardous and Solid Waste Workgroup.

**P** **TOTAL AND UNIT GENERATION OF HAZARDOUS WASTE IN THE BORDER REGION**

According to INE's data for the six Mexican border states, the total generation of hazardous waste in 1998 was 1,107,256 tons. In 1999, the total generation was 1,081,537 tons. These data may be modified as new information from the generators is submitted to INE.

According to EPA data, as seen in Figure 9-3, the total generation of hazardous waste on the U.S. side of the border region in 1997 was 17,946 tons. It is important to note that the tracking system responsible for providing the data includes only large-quantity generators (that is, those that generated more than 1.1 tons of hazardous waste per month).

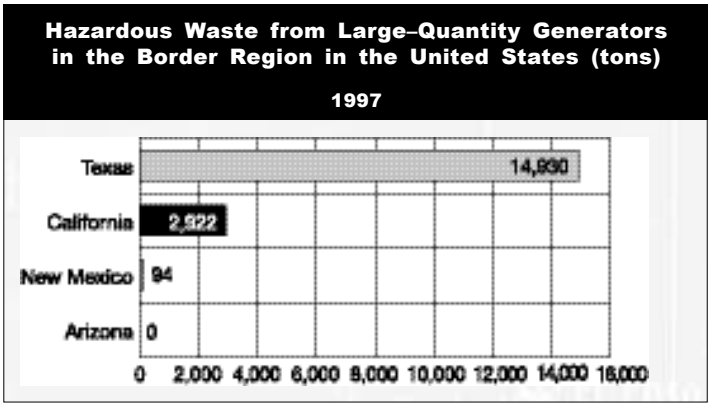



***Figure 9-3***

EPA and INE data are not comparable because the classification of hazardous waste differs in the two countries. The data for Mexico represent the total waste generated throughout the Mexican border states, not just in the border region. Total waste in Mexico includes that which is generated in the *maquiladora*, Mexican national industry, and bio-infectious waste sectors.

The workgroup has not been able to devise an appropriate method of calculating unit generation, such as per-industrial-employee generation or per-dollar-value-of-production generation. To assess how much hazardous waste is generated on these bases, very accurate data are needed on how many people work in the industries that are generating hazardous waste or precisely what the value of production is in those industries.

**P** **HAZARDOUS WASTE GENERATION IN *MAQUILADORAS* IN THE BORDER REGION OF MEXICO**

The only data currently available for this indicator concern the number of *maquiladoras* in Mexico's border region (Figure 9-4). The data from Mexico's *Secretaría de Comercio y Fomento Industrial* (SECOFI, or Secretariat of Commerce and Industrial Development), on which these data are based, report 2,037 *maquiladoras* in the border region in July 1998 and 2,633 in July 1999. INE does not have data on the total generation of hazardous wastes by the *maquiladora* industry. The lack of available information suggests the need for

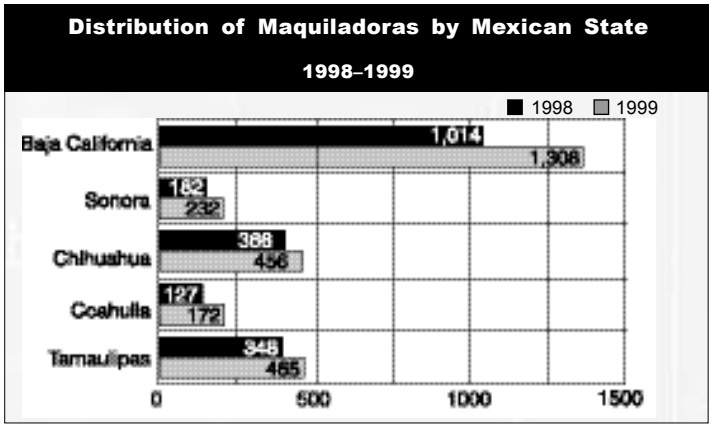



***Figure 9-4***

ities aimed at obtaining more data.

**R** **QUANTITIES OF HAZARDOUS WASTE SENT FROM MEXICO TO THE UNITED STATES FOR TREATMENT AND/OR DISPOSAL[2]**

According to the information appearing in the reports from SEMARNAP's branch offices in the border states, the hazardous wastes sent from Mexico to the United States from 1996 to 1999 are as shown in Figure 9-5 on the following page. It is worth mentioning that the wastes exported by Mexican industry in the greatest quantities are solids with a high content of vanadium pentoxide, used battery acids, and

[2] The Spanish version of this chapter for distribution in Mexico presents this information as two separate indicators: (1) Hazardous Waste Returned from Mexico to the United States by Maquiladoras (*Residuos Peligrosos Retornados de México a EUA por las Maquiladoras*); and (2) Hazardous Waste Exported from Mexico to the United States for Treatment and/or Final Disposal (*Residuos Peligrosos Exportados de México a EUA para Tratamiento y/o Disposición Final*).

used catalyzers. The data suggest a trend toward an increase in the amount of those wastes exported, probably because the appropriate technology and infrastructure needed to manage those waste products does not exist in Mexico.

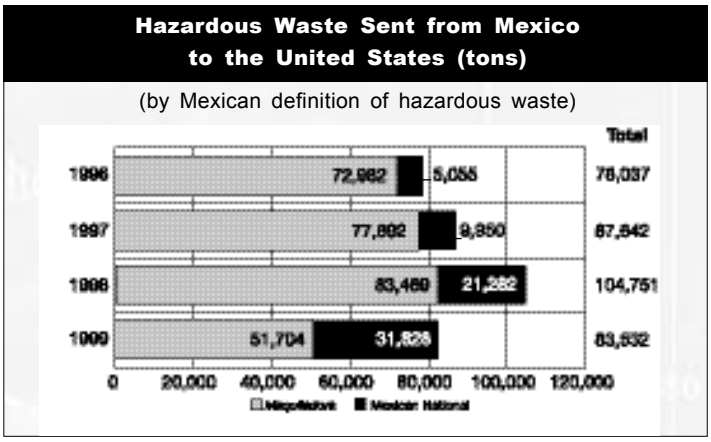



*Figure 9-5*

According to EPA HAZTRAKS data, 11,057 tons (10,052 metric tons) of hazardous waste were sent to the United States from Mexico in 1997 (Figure 9-6). Again, the difference between the numbers is accounted for by the factors discussed above.

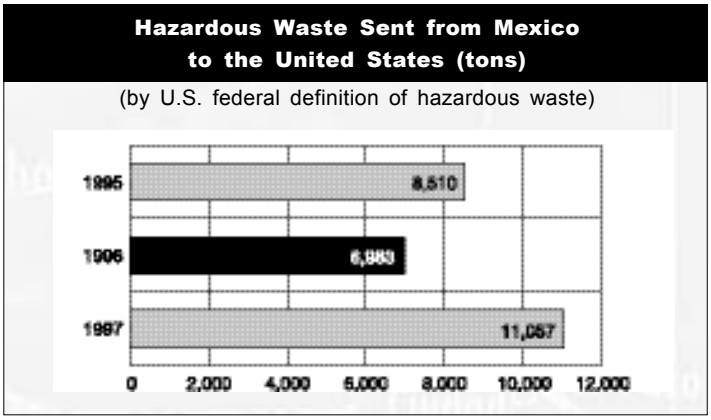



*Figure 9-6*

**R** **QUANTITIES OF HAZARDOUS WASTE EXPORTED FROM THE UNITED STATES TO MEXICO FOR RECYCLING**

Figure 9-7, which is based on INE data, presents a registry of total imports of hazardous waste to be recycled in Mexico. The hazardous wastes imported in greater volume throughout the country are those with a high content of zinc, tin-lead powders and residues, and automotive batteries.

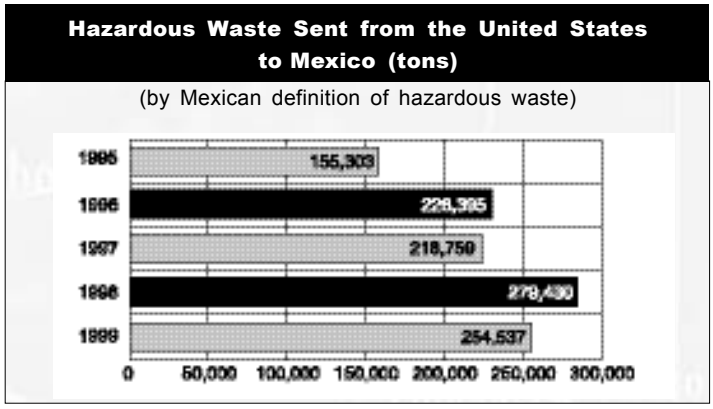



*Figure 9-7*

Numerous factors affect the pattern seen in this indicator. One important element to be aware of is that one single facility, located in Monterrey, Nuevo León accepts more than half the total hazardous waste sent to Mexico each year for recycling. The facility recycles electric arc furnace dust from steel mills in the United States. Another factor related to the increasing trend seen in this indicator is INE's policy of encouraging the development of recycling capacity, as discussed above. As the number of businesses established for recycling hazardous wastes has increased in recent years, more hazardous waste from the United States has been imported for recycling.

**R** **PERMITTED COMMERCIAL DISPOSAL CAPACITY FOR HAZARDOUS WASTE IN THE BORDER REGION**

Currently, there is only a single site in Mexico for the final disposal of hazardous wastes. The site is located in Nuevo León. The site's capacity is 1,200,000 tons per year. Mexico has no permitted disposal capacity in the entire border region. The lack of disposal sites indicates the urgent need for investment to develop hazardous waste disposal infrastructure.

The U.S. border region has one commercial disposal site, located in Westmorland, California. However, on a national level, the United States has a surplus of hazardous waste disposal capacity.

**Hazardous and Solid Waste Disposal Facilities in the U.S.-Mexico Border Area**

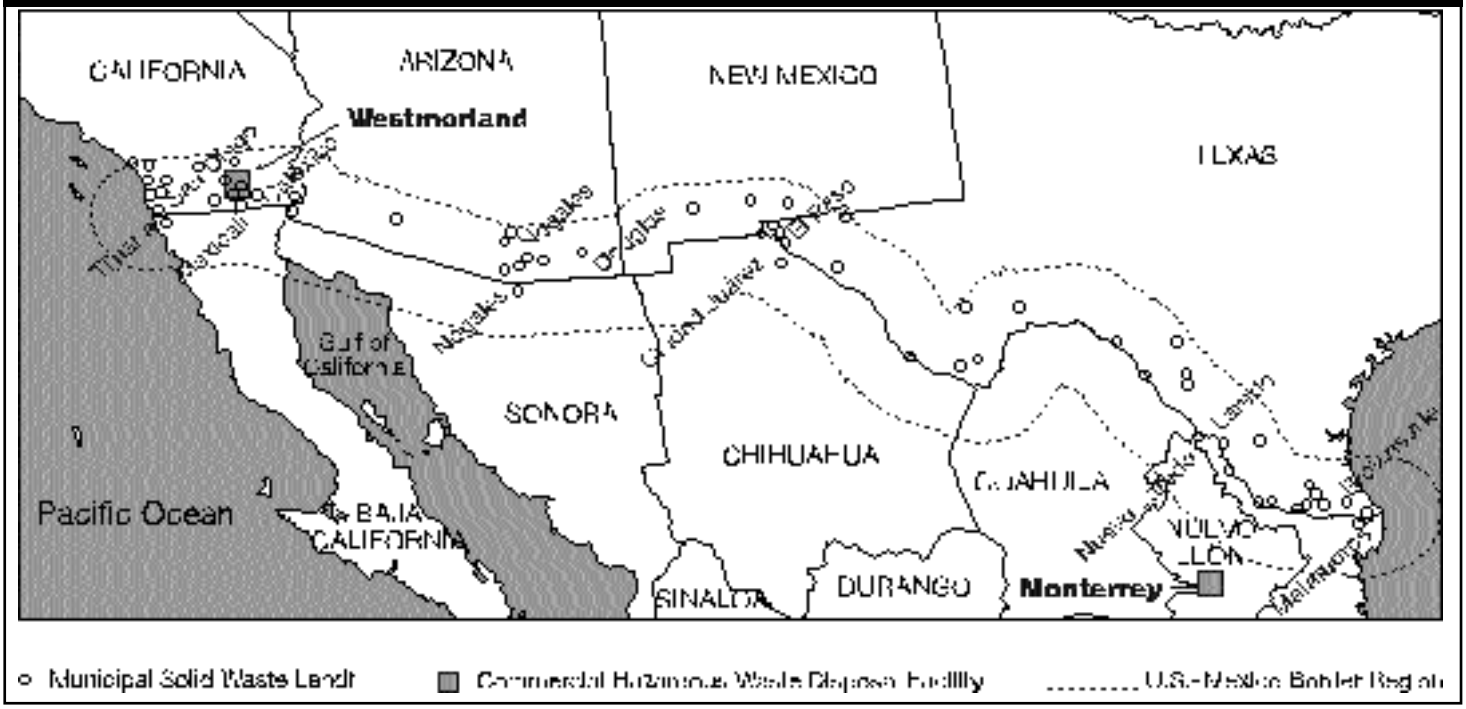



***Figure 9-8***

## R PERMITTED DISPOSAL CAPACITY FOR SOLID WASTE IN THE BORDER REGION

There are five sanitary landfills in operation in Mexico's border region for the permanent disposal of municipal solid wastes. These sites are located in Tijuana, Nogales, Ciudad Juárez, Nuevo Laredo, and Matamoros. In addition, a number of proposed projects for the additional final disposal and appropriate management of municipal solid wastes are being reviewed by local governments and Mexico's *Secretaría de Desarrollo Social* (SEDESOL, or Secretariat of Social Development).

The U.S. border region has suitable municipal solid waste disposal infrastructure. Specifically, within the border region, there are 27 municipal solid waste landfills in Texas, 10 in Arizona, 18 in California, and 4 in New Mexico. This information is shown on the map in Figure 9-8.

## R RECYCLING CAPACITY IN THE BORDER REGION

Twenty-three companies are authorized by INE to recycle hazardous wastes in Mexico's border states. Of them, seven are for used solvents, five for metals, four for used drums, and three for used lubricants, and four are for integrated handling for the preparation of alternate fuel. It is important to note that this information is provided for facilities located throughout Mexico's border states; they are not necessarily within the 100-kilometer (km) (62.5-mile) border zone. Within the 100-km border region in the United States, there are two commercial recycling facilities. One recycles spent solvents and the other recycles both solvents and metals (Figure 9-9 on the following page).

There are several reasons why the number of such facilities in Mexico is much higher than that in the United States. First, as noted above, the data for Mexico indicates the number of recycling facilities in the border states, not the 100-km border region. Second, with some exceptions, the Mexican side of the border is generally more heavily industrialized. Because of that factor, there are more service industries, such as hazardous waste recyclers, to address the hazardous waste management needs of industry in the Mexican states. A final reason for this difference has to do with INE's policy of recent years to strongly encourage hazardous waste management companies to develop recycling rather than disposal capacity, to reduce the amount of hazardous waste that must ultimately be sent for disposal.

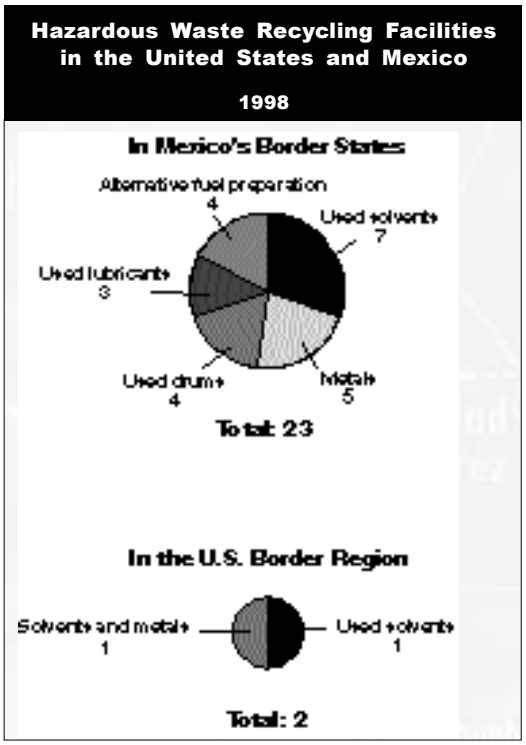



***Figure 9-9***

## OTHER NOTABLE ACTIVITIES AND ACHIEVEMENTS

### Coordination on Radioactive Waste Issues

The Hazardous and Solid Waste Workgroup has taken on responsibility for binational coordination on issues related to radioactive waste on the U.S.-Mexico border. Previously, no forum for coordination on environmental issues related to such waste had existed. When concern was raised by communities on both sides of the border about a proposed radioactive waste disposal facility in Texas, the Hazardous and Solid Waste Workgroup assumed responsibility for coordinating communication between the two countries on this important issue and will continue to serve as a forum for such communication.

### *Maquiladora* Hazardous Waste Return Requirement

Currently, it is required that hazardous wastes generated by *maquiladoras* be returned to the country of origin of the raw materials used in manufacturing. There has been a great deal of uncertainty about whether this requirement would be eliminated with the full phase-in of the *North American Free Trade Agreement* (NAFTA) in the year 2000. EPA and INE developed a policy paper stating that the requirement will remain in force after 2000. The continuation of this requirement is critical for the protection of the environment along the border in both countries.

## FUTURE PERSPECTIVES

With the implementation of NAFTA, the future of the *maquiladora* industry is quite uncertain. Although the *maquiladora* program will not be eliminated, the incentives for operating *maquiladoras* will diminish as tariffs are eliminated under NAFTA, because *maquiladoras* will no longer be unique in their protection from such tariffs. Therefore, it is difficult to predict whether the *maquiladora* sector will continue to grow as it has in the past. It is possible that fewer and fewer companies will register as maquiladoras and that existing maquiladoras will choose to drop their maquiladora status and operate as Mexican national industries.

This factor is significant from the perspective of the Hazardous and Solid Waste Workgroup for a number of reasons. First, different rules govern hazardous waste from *maquiladoras* and that from Mexican national industry. If companies operating in Mexico, particularly U.S.-based companies, choose to operate outside the *maquilador*a program, they will not be required to return their hazardous wastes to the United States, thereby further taxing Mexico's already overburdened hazardous waste management infrastructure and presenting greater enforcement challenges for Mexican authorities. Therefore, the issue will call for careful scrutiny in the years to come, and binational cooperation and coordination will be required to address it fully. A second important point, however, is that this circumstance also presents an opportunity for a concerted binational effort to develop hazardous waste management infrastructure in Mexico in a sound, rational fashion, with a focus on waste minimization and recycling.

The workplan of the Hazardous and Solid Waste Workgroup has identified the following goals:

- More precisely ascertain the generation of hazardous wastes in the border region in Mexico, by type and source.
- Encourage all *maquiladoras* in the border region to have a *Número de Registro Ambiental* (No. RA, or Environmental Registry Number), to improve follow-up on the cross-border movement of hazardous waste and achieve com-

pliance with the relevant legislation by the end of this year.

- Encourage the establishment of hazardous waste infrastructure in Mexico.
- Increase efforts on solid waste issues, especially focusing on waste tires, creating a national tire recycling program in Mexico, with the aim of providing alternatives to disposal based on application of different technologies.
- Make more effective use of HAZTRAKS and SIRREP.
- Promote policies that minimize generation at the source through the maquiladora parent companies in the United States.
- Efforts will be made to persuade border region maquiladora companies to apply the same environmental standards and control systems used by the parent companies in the United States.
- INE will attempt to develop a tracking system for the import and export of toxic substances that permits coordination with the SIRREP and HAZTRAKS systems for tracking hazardous waste.