Tracking and Enforcement of Transborder Hazardous Waste Shipments in North America

A Needs Assessment

COMMISSION FOR ENVIRONMENTAL COOPERATION

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Published by the Communications and Public Outreach Department of the CEC Secretariat.

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Printed in Canada	

Preface

This report was commissioned by the Commission for Environmental Cooperation (CEC) under the guidance of the North American Working Group on Environmental Enforcement and Compliance Cooperation (EWG). It was prepared as a background report in support of an ongoing project of the CEC Law and Enforcement Cooperation Program, initiated in 1995 for enhancing regional cooperation for improved tracking and enforcement of North American laws regulating the transboundary movement of hazardous wastes and chloroflurocarbons (CFCs). The report surveys current government policies and programs for tracking and enforcing related laws and identifies alternative reforms for improved capacity for national action and regional cooperation in this regard. It was presented as background information for the June 1997 meeting of the CEC Task Group on Tracking and Enforcement of Hazardous Wastes in Calgary, Alberta. Further information on the work of the Task Group can be obtained from the CEC at <http:/www.cec.org>.

We wish to acknowledge the work of the consultant team who undertook the research and prepared this report as follows:

Ken Rubin, Apogee Research Inc.	- Project Team Coordinator - United States Report
Ken Watson, Apogee Research International	- Canada Report
Alberto Acevedo, P.E.ASI International	- Mexico Report

Appreciation is also extended to the CEC Hazardous Waste Task Group for their advice in the study design, assistance to the study team for completion of the study, and review of draft reports. We are extremely grateful to those government officials who provided information and reports to the consultant team. We also wish to recognize Paul Muldoon and John Jackson for their assistance in editing of the report.

Finally, gratitude is extended to the following persons who assisted the CEC in preparation of the project report and in coordination of the Hazardous Waste/CFC Project: Tim Jones, Julie Pelletier, Natalie Daoust, and Doris Millan.

We wish to clarify that unless otherwise specified, the report reflects the opinions of the consultants and it not intended to represent the views or opinions of either the Parties or the CEC.

Linda F. Duncan
Head
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Executive Summary

This report, prepared for the Commission for Environmental Cooperation, under the guidance of the North American Working Group on Environmental Enforcement and Compliance Cooperation,is intended to facilitate dialogue between United States, Mexican, and Canadian hazardous waste management officials on how best to meet the challenges of monitoring and enforcing hazardous waste regulations in the NAFTA era. Specifically, it offers a series of recommendations for integrating and/or supplementing tracking systems to enhance North American capacity to share data and improve the effectiveness of enforcement of domestic hazardous waste regulations and international agreements that address transborder shipments of hazardous waste.

Legal Framework

The United States, Mexico and Canada have developed systems to track the transborder movement of hazardous waste in response to a series of multilateral and bilateral agreements and provisions of domestic laws and regulations written to implement relevant portions of these agreements. Since both preceded the Basel Agreement, the Canada/United States Bilateral Agreement governs procedures for waste flow between the United States and Canada and the United States/Mexico Bilateral Agreement governs procedures for waste flow between the United States and Mexico.

Domestic statutes and regulations establish domestic provisions for tracking and control pursuant to these bilateral agreements. In the United States, the Resource Conservation and Recovery Act (RCRA) and its regulations in 40 CFR Part 260 specify exact procedures for pre-notification and consent prior to exporting hazardous waste and manifesting hazardous waste shipments within the United States and across North American borders. The Toxic Substances Control Act (TSCA) and its regulations in 40 CFR 761.91 *et. seq.* prescribe procedures for pre-notification prior to importing PCBs. In Canada, 1992 Export and Import of Hazardous Wastes (EIHW) Regulations under the Canadian Environmental Protection Act (CEPA) are the primary regulations for tracking transborder movements of hazardous waste into, from and through Canada. Canada's Transportation of Dangerous Goods Act and regulations are involved through the use of waste manifests and in transportation safety issues. In Mexico, transborder movement of hazardous waste is governed by the provisions of Mexico's General Ecological Equilibrium and Environmental Protection Law (LGEEPA), enacted on January 28, 1988 and amended on December 13, 1996.

Existing Systems to Track Transborder Shipments of Hazardous Waste

It is useful to characterize tracking systems as they apply to hazardous waste (1) *before shipment*, (2) *during shipment*, and (3) *after shipment*. This life-cycle characterization helps rationalize the design of certain tracking systems and helps explain their utility for enforcement of domestic hazardous waste management laws. At each stage, theoretically, enforcement agencies across borders should be able to compare information from both exporting and importing perspectives on individual shipments and on activities over time of an individual participant—generator, shipper, transporter, or management facility—in the life-cycle management of hazardous waste. In practice, this is not possible.

Systems that handle information *before shipment* focus on pre-notification of intent to export or import, consent of that prospective activity, and sometimes acknowledgment of receipt of consent. Exchange of this information typically takes place among government agencies and is prospective with respect to waste types, quantities, frequency of shipment, and ultimate disposition. In large measure, information at this stage is a proposal and not necessarily representative of what eventually gets shipped.

Systems that handle information *during shipment* contain information drawn from waste manifests, such as exact types and quantities of waste being shipped, identification of the generator (or shipper), identification of the intended recipient, intended ports of entry, and intended management method. These data are supposed to be precise and travel with each shipment of waste from "cradle to grave." These systems require private participants in the waste management cycle to interact with multiple government agencies at the federal level (regulatory and customs, for example) and at the state/provincial level.

The third type of system handles information about waste management *after shipment*. These data generally are not tracked, *per se*, but are submitted to regulatory agencies in the case of the United States, as

annual or biennial reports or in the case of Canada, as certificates of disposal/recycling. Data in these reports include, for example, annual total quantities of each type of waste handled, annual quantities received from (or shipped to) certain generators (or management facilities), and how these shipments ultimately were managed. With respect to the tracking of the transborder movement of hazardous waste, its value is in corroboration of information provided in the first two steps.

United States

At the national level the United States maintains five separate systems to track potential and actual transborder movements of hazardous waste and requires periodic reports of waste imports: (1) EPA's WITS database for tracking notices of intent to import hazardous waste *before shipment*, (2) EPA's Hazardous Waste Export database for tracking notices of intent to export hazardous waste *before shipment* as well as actual shipments (manifests) and annual reports of RCRA-permitted hazardous waste generators and shippers (so-called, "primary exporters") summarizing waste exported during the year, (3) Haztraks for tracking notices and actual shipments (manifests) of hazardous waste across the United States-Mexico border, (4) annual reports to EPA prepared by facilities managing imported PCBs pursuant to 40 CFR 761.180(b)(3), and (5) biennial reports submitted to EPA by RCRA-permitted treatment, storage, or disposal (TSD) facilities managing imported (and domestic) hazardous waste.

Canada

The Canadian Notice and Manifest Tracking System (CNMTS) is Canada's principal system for tracking the movement of hazardous waste and PCBs. It holds and manipulates information drawn from notices of intent to export or import hazardous waste or PCBs (exports only) and corresponding waste manifests. As such, it tracks information *before* and *during* shipment. Canada does not require that its hazardous waste management facilities submit annual reports, and thus, has no formal reporting of waste handling *after* shipment.

Mexico

The same United States Haztraks system is used in Mexico to monitor transborder shipments of hazardous waste. The official document to be submitted in connection with such shipments is the Ecological Guide (*Guía Ecológica*). This document must be requested from the National Institute of Ecology (INE) of the Mexican Ministry of the Environment, Natural Resources and Fisheries (Semarnap) at least 45 days prior to the intended shipment, by forwarding an application form containing information similar to that included on the United States manifest form. These documents are known as Hazardous Materials or Wastes Import or Export Manifests and/or Hazardous Waste Return Notices for those companies that import raw materials under the temporary import regime. This tracking system contains data on Mexican-based generating facilities, as well as on the carriers and service providers involved in the shipment of such waste. It also contains information on the TSD facilities to which returned waste is shipped. *Guía* applications contain the following information related to the proposed transborder shipment: generator's name, quantity of waste, physical and chemical characteristics, shipment port of entry, name of the carrier and authorization delivered by INE, name of the company abroad that will receive the waste, and the intended receiving authorization. These requests must be accompanied by the carrier's insurance covering third-party and environmental damages and a bond that guarantees the good use of the *Guía*, among other things.

Limitations of Existing Waste Tracking Systems

Limitations of existing hazardous waste tracking systems for purposes of enforcing laws and regulations on transborder movements of hazardous waste and international agreements fall into the following broad areas:

- the quality, quantity and timing of information they manage;
- the extent to which they are compatible or link with other domestic and international sources of data; and
- responsiveness to enforcement needs.

1) Quality, Quantity and Timing of Information

All tracking systems have been characterized as deficient with respect to quality, quantity and timing of information. Some information is required, but not submitted because of a lack of enforcement of reporting requirements. Other data, which are simply not managed at all or not linked to waste tracking systems, could be particularly helpful to enforcement efforts if they were explicitly linked to existing tracking systems or otherwise made available for planning and targeting of enforcement efforts:

- waste generation statistics of generators across borders;
- actual transport manifest data from generators across borders;
- compliance records of generators, transporters, importers, and treatment, storage and disposal facilities;
- information provided by informants on specific shipments or companies;
- prosecution tracking reports and "tricks of the trade" used by the waste management/transport community to circumvent laws;
- requests for information from waste brokers and generators; and
- information held by United States Customs in the Numerically Integrated Profiling System (NIPS) database, which records information on each shipment entering the United States

Of course, issues of confidentiality will become even more difficult to address if either more information is made available or accessibility to existing information is enhanced without proper controls.

2) Compatibility Among Domestic and International Tracking Systems and Data Sources

By far, the most critical limitation of existing tracking systems identified is their inability to track a single shipment "from cradle to grave" when the cradle is in one country and the grave is in another. Sources of this inability emanate from:

- **Differences in definitions of hazardous waste**—fully two-thirds of the hazardous waste shipped as hazardous from Mexico to the United States is unregulated in the United States and is not captured in United States tracking mechanisms. The same is true of lead-acid batteries and waste oils shipped to the United States from Canada. Harmonization will help, but harmonization to the lowest common denominator will be unacceptable.
- **Timing of information submission**—to centralized keepers of waste shipment data. Currently, no tracking systems operate in "real time." Immediate enforcement response to tracking information is, therefore, impossible. In fact, some information arrives and is entered two to three years after shipment has taken place.
- **The lack of a uniform numbering system**—that assigns unique shipment numbers to each shipment regardless of whether it crosses a border. Without such a number, enforcement officials must resort to matching manifests and/or notices, which appears to be problematic. Loss of identity of shipments at transfer/bulking operations further obscures United States, Canadian and Mexican ability to trace shipments from cradle to grave.
- **Non-Compliance with Foreign Manifest Systems**—Canadian operators and shippers report that United States waste management facilities at times refuse to complete the Canadian manifest requirement of issuing a "certificate of destruction." Similar procedures also appear to be violated for Mexican shipments to the United States.

3) Responsiveness to Enforcement Needs

Existing tracking systems do not adequately support enforcement. Tracking systems and the procedures for transfer of information appear to meet the needs of the relevant bilateral agreements *for shippers that want to comply with their obligations under these agreements*. That is, systems exist to assure that pre-notification and consent takes place for those who enter the system and that this information is retained for future use. But tracking systems designed to accomplish these goals do not necessarily accomplish the broader goals of:

- tracking *all* transborder shipments of hazardous waste;
- identifying illegal traffic;

- ensuring that all waste that should be shipped across borders actually is shipped; and
- ensuring that waste shipped across borders is handled in an environmentally safe manner.

Weaknesses in existing systems appear to offer opportunities to circumvent domestic laws and international agreements. One graphic example is that waste shipped from Mexico to the United States cannot be traced back to the Mexican generator, so there is no way to enforce provisions of Mexican law that require waste generated by United States-owned companies in Mexico (so-called maquiladora plants) to be returned to the United States for management. Another is that the United States cannot ensure that waste generated in the United States and shipped to Mexico for recycling actually is recycled. The United States receives no information on the ultimate disposition of waste once it crosses the United States-Mexico border.

Moreover, tracking system information is generally not designed—and therefore, is generally not useful—to address the issue of illegal shipments of hazardous waste. The Canadian CNMTS database flags suspicious shipments and sends information to Canadian Customs, but this application appears to be the only direct use of tracking information to stop illegal shipments. Border sweeps in all three countries are undertaken independently of tracking efforts and results of sweeps are not entered into tracking databases, since information so obtained often is confidential. Enforcement officials generally resort to other types of information, more appropriately thought of as "intelligence" information, for purposes of identifying and stopping illegal shipments of hazardous waste across borders.

4) Summary of Proposed Improvements

a) Increase the Effectiveness of Enforcement Efforts

Interviewees in all three countries suggested that enforcement efforts could be strengthened simply by linking or sharing more readily available sources of information within their own countries. Sharing existing data among agencies of the same country would appear to be the most productive short-term action that a country can take to enhance its own enforcement efforts. Toward that end, the following reflect some of the key suggestions for improvement:

1. For the United States, consider linking waste tracking databases to media compliance databases through EPA identification codes for individual generators and TSD facilities.
2. For all three countries, efforts are needed to improve access to databases on imports and exports of waste enforcement agencies and customs.
3. Make available, in read-only format, Mexican Haztraks information to other agencies involved in regulation of hazardous waste transportation, imports, and exports, such as SCT, Secofi, and SHCP (Customs).
4. Improve sharing of information among Environment Canada, Canadian Customs, and Statistics Canada (B13 forms).

It may be important to note the limitations of Customs data. Customs tariff coding, which is developed by the World Customs Organization, does not indicate unambiguously whether a material is a waste or whether it is hazardous. Until and unless these codes are made more explicit for waste, Customs information may be more valuable for intelligence than for tracking.

b) Institute True Origin to Destination Tracking by Linking Existing Databases

All three countries should consider the use of a standard system of numbering for all transborder waste shipments, regardless of their origin or destination. In addition, all three countries should consider using a standardized, perhaps tri-lingual, waste manifest form for all transborder shipments of hazardous waste.

A standardized shipment numbering system would be the first step toward linking the four key hazardous waste tracking systems in place in North America: CNMTS, Haztraks, Exports, and WITS. Linking existing databases, in turn, could be the initial step toward developing a tri-national tracking system or two bi-national systems. The ability to link information in these databases by shipment number would greatly facilitate systematic searches of information, increase the number and quality of checks that each country could undertake, and facilitate computerized flagging of abnormalities and inconsistencies.

c) Harmonize Differences in Definitions of Hazardous Waste

Tracking systems in each of the three North American countries rely on their own,somewhat different,domestic legal definitions of hazardous waste. This results in some waste flows that exit tracking systems when they cross borders, thereby escaping the exporting country's ability to track waste flow from "cradle to grave."

All three countries should consider establishing common procedures and managing waste flow data to track all wastes classified as hazardous by any one of the three North American countries. Alternatively, they could establish common procedures and manage waste flow data to track waste according to a "harmonized" system appropriate to the definitions of hazardous waste in all three countries. One option is the OECD red-amber-green waste classification system.

Using both the OECD waste classification scheme *and* domestic waste classification schemes for purposes of tracking waste flows in North America would enable each country to respond to the information needs of the others regardless of whether the waste in question was considered hazardous under domestic definitions. It would also coordinate North American conventions with those of Europe and other industrialized nations.

d) Improve Completeness, Accuracy and Timing of Tracking Data

Information on waste manifests sometimes is incomplete, inaccurate and untimely. This can frustrate enforcement officials' ability to track waste shipments from "origin to destination" and can result in circumvention of both domestic waste management laws and international agreements regarding transborder movement of hazardous waste. Therefore, each country should consider:

1. incrementally moving toward more real-time waste tracking as resources allow;
2. instituting new technologies (electronic manifests, bar-codes, scanners, etc.) to reduce data entry errors and reduce the time needed to maintain waste tracking systems; and
3. harmonize regulatory requirements for tracking of imports and exports across all three North American countries to help ensure cross-border compliance with foreign requirements.

e) Add Certain Key Information to Tracking Systems

All three countries should consider adding appropriate data to existing tracking systems or linking tracking information to other sources of data to improve the usefulness of tracking information for enforcement. Examples include:

1. Adding information to hazardous waste tracking databases on compliance histories of regulated entities with all applicable environmental regulations. Such information could be added directly or linked to such databases through ID codes of specific waste generators, shippers, and treatment, storage and disposal facilities.
2. Adding other types of data, such as public complaints about specific generators, shippers, or management facilities, information about detained shipments of hazardous waste, or financial performance data at the firm level as "modules" to existing hazardous waste tracking databases.

Confidentiality could be ensured by limiting access to these data or by hiding certain fields and linking to "read-only" versions of certain databases.

f) Increase Resources for Tracking Transborder Waste Shipments

Serious needs exist for better hardware, software, and training of individuals in the use of data on waste movements. Perhaps the most pressing need exists in Mexico. Investments in these areas should be increased to strengthen enforcement efforts, for example, by improving existing systems focused on compliance.

g) Improve Results of Enforcement Actions by Using Tracking Databases in Conjunction with Other Key Information

While detailed analysis of this issue was beyond the scope of this study, the effectiveness of tracking databases, indeed monitoring and enforcement efforts in general, can be improved with supplemental information such as:

i) monitoring and detection of illegal traffic;

ii) compilation of intelligence information; and

iii) measurement of the relative effectiveness of alternative enforcement actions and efforts.

1 Introduction

1.1 Background to the Report

The North American Agreement on Environmental Cooperation (NAAEC) was entered into in 1993 by Mexico, the United States and Canada to address regional environmental concerns, to help avoid potential trade and environmental conflicts and to promote the effective enforcement of environmental laws of the three countries. The NAAEC establishes the Commission for Environmental Cooperation headed by a Council of cabinet level officials, a Secretariat whose role is to assist the Parties in the delivery of the objectives of the agreement, and a Joint Public Advisory Committee.

In 1995 the Council established the CEC Law and Enforcement Cooperation Program to:

- provide a forum for North American cooperation in environmental enforcement and compliance;
- support initiatives for sharing enforcement-related strategies, expertise and technical knowledge;
- support capacity building in effective enforcement and enhanced compliance;
- facilitate the development and implementation of trilateral enforcement cooperation programs and initiatives;
- examine alternative approaches to enforcement and compliance; and
- support the Parties in the preparation of annual enforcement reports and the examination of improved indicators or measures of effective enforcement and compliance.

The Law and Enforcement Cooperation Program responds directly to obligations and opportunities arising under the NAAEC, including Articles 5, 6, 7, 10(4), 12(2)(c), which collectively impose obligations on the Parties: to effectively enforce their respective environmental laws in accordance with an agreed framework; to pursue avenues of cooperation to this end; to effect specified private enforcement rights and opportunities; and to provide an annual public report on the enforcement of environmental laws.

The Law and Enforcement Cooperation Program is developed and delivered in consultation with the North American Working Group on Environmental Enforcement and Compliance Cooperation, officially constituted by the Council in August 1996 and mandated to support cooperation and joint initiatives for environmental enforcement and compliance, the exchange of information and expertise, joint training, and the preparation of the annual report on environmental enforcement. The Program attempts to address issues and concerns about environmental enforcement and compliance brought to the attention of the CEC by government agencies, industry, NGOs, academics, and experts in the area. Efforts are made to monitor current issues or innovations in the field of enforcement and compliance, and to facilitate the exchange of information, discussion about, and review of these common matters.

With the assistance of the Enforcement Working Group, the CEC has endeavored to focus the Program on long-term priority areas of concern to all three countries. In 1995, the Enforcement Working Group determined that a priority for North America was the improved tracking and enforcement of laws regulating the trade and transportation of hazardous wastes and chlorofluoro carbons (CFCs). A task force of hazardous waste officials from the three countries was formed to identify barriers and constraints to effective tracking and enforcement and to pursue joint actions for improvement. Establishing a North American hazardous waste tracking system was deemed to be important for the involved governments to effectively record, monitor and regulate the transboundary movement of hazardous waste. The system would enhance international and interagency cooperation in compliance monitoring and enforcement of transboundary hazardous waste laws.

In 1996, the CEC commissioned this report intended as a baseline report to facilitate dialogue between the United States, Mexican and Canadian hazardous waste management officials on how best to meet the challenges of monitoring and enforcing hazardous waste regulations in the post-NAFTA era. Based on interviews with hazardous waste tracking and enforcement officials and government reports, the report documents opportunities and limitations of current tracking and enforcement systems, identifies key agencies and provides proposals for integrating and/or supplementing existing systems in furtherance of enhanced capacity to exchange data and cooperate in more effective enforcement.

1.2 Study Methodology

The study was completed in three phases. In phase one, the contractors reviewed the literature from each of the three countries and presented information on hazardous waste tracking and enforcement laws, regulations, programs, and systems in North America. The results of phase one—*An Overview of Hazardous Waste Tracking in North America*—were submitted to CEC in draft form in November 1996. Comments from all three countries were received through April 1997 and the report was resubmitted in final form. A summary of that information is repeated in Chapter 2 of this final report.

In phase two, the contractors conducted more than fifty interviews with environmental enforcement and Customs officials in the United States, Mexico, and Canada. A copy of the interview guide is provided as Appendix A to this report. Interview results were summarized in a February 1997 task report—*Hazardous Waste Tracking in North America: Interview Results.* Findings drawn from phase two are incorporated in this final report.

In phase three, the contractors synthesized the results of the first two reports into this final report. The findings and proposals in this report were presented to the CEC Task Group on Hazardous Wastes and CFCs in June 1997. This final report endeavors to reflect that final feed-back.

1.3 Organization of the Report

The report is presented in four parts. Chapter 2 provides a synopsis of relevant international laws and multilateral and bilateral agreements. A synopsis is also provided of domestic laws and policies in the United States,Mexico and Canada governing the transborder movement of hazardous waste. Material in this chapter has been drawn from the phase one report, *An Overview of Hazardous Waste Tracking in North America.*

Chapter 3 presents a summary of current practices, issues and limitations of tracking systems drawn from interviews with United States, Mexican, and Canadian officials. In essence, Chapter 3 reviews what is being done in the field to implement the international and domestic laws outlined in Chapter 2.

Chapter 4 deals specifically with the limitations of existing North American hazardous waste tracking systems from an enforcement perspective. It examines the compatibility of tracking systems within each country and across borders. It also discusses the quantity and quality of information on existing systems, and the differences between tracking system information and intelligence.

Chapter 5 offers proposals synthesized from the interviews and background literature on whether and the extent to which the effectiveness and/or efficiency of transborder hazardous waste tracking systems can be improved for purposes of enforcement of domestic laws and international agreements on such movement. It also includes a series of policy proposals directed at improved enforcement of laws and agreements, not necessarily related to tracking systems or the use of waste movement data.

2 Synopsis of Relevant Law, Policy and Trade Activity

Material presented in this chapter has been abstracted from the literature, the text of the various laws and regulations, and from interviews with enforcement officials in all three countries.

2.1 International Law, Multilateral and Bilateral Agreements

Four agreements currently establish the framework for tracking and controlling of Canada-United States and Mexico-United States transborder flows of hazardous waste:

- the Basel Convention,[1]
- the Organization for Economic Cooperation and Development (OECD) Decision Concerning the Control of Transfrontier Movements of Waste Destined for Recovery Operations,[2]
- the Canada/United States Bilateral Agreement,[3] and
- the United States/Mexico Bilateral Agreement (or the LaPaz Agreement).[4]

In large part, these agreements have driven the specific controls governing international movements of hazardous wastes that are in place in each country. These multilateral agreements establish the broadest framework, but since both the United States-Mexico and the United States-Canada bilateral agreements preceded the multilateral agreements and they are compatible, they take precedence over the multilaterals. Domestic statutes and regulations establish domestic provisions for tracking and control pursuant to these bilateral agreements.

The purpose of these agreements is to promote bilateral cooperation in tracking transborder movements of hazardous wastes and the effective enforcement of hazardous waste laws in United States, Mexico and Canada. The protocol thus established for international and domestic regulation of transborder movements of hazardous wastes recognizes the sovereign right of a country to ban exports and imports of hazardous waste, but permits international movement of such wastes subject to notification prior to shipping by the exporting country and consent to receive the shipment by the importing country.

For the most part, these two agreements are very similar. Table 1 compares some of the primary components of the United States-Mexico and the United States-Canada agreements. Disparities include the timeframe for response to notification of intent to ship and whether consent is tacit or explicit.

[1] The Basel Convention on the Control of Transborder Movements of Hazardous Wastes and Their Disposal, March 22, 1989, (May 1992) was signed, but not ratified by, the United States.

[2] Organization for Economic Cooperation and Development (OECD) Decision Concerning the Control of Transfrontier Movements of Waste Destined for Recovery Operations, C(92)39/Final, March 30, 1992.

[3] Agreement Between the Government of Canada and the Government of the United States of America Concerning the Transborder Movement of Hazardous Waste, October 28, 1986.

[4] Annex III to 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:Agreement of Cooperation Between the United States of America and the United Mexican States Regarding the Transborder Shipments of Hazardous Wastes and Hazardous Substances,November 12,1986.

Table 1 **Comparison of the Canada/United States and the United States/Mexico Bilateral Agreements**

Primary Components	Canada/United States Agreement	United States/Mexico Agreement
Overview	Establishes the conditions for the export, import and transit of hazardous wastes between the two countries.	Ensures that export, import and transit of wastes between countries is conducted in such a manner as to reduce or prevent risks to public health, property, and environmental quality
Materials Covered	Hazardous waste and other waste.	Hazardous waste and hazardous substances.
Definitions of Hazardous Waste	In Canada, hazardous wastes are "waste dangerous goods" as defined by the Transportation of Dangerous Goods Act. In the United States, hazardous wastes are any wastes subject to manifest requirements pursuant to the Resource Conservation and Recovery Act.	In the United States, hazardous wastes under this agreement are those established by the United States Environmental Protection Agency. In Mexico, hazardous wastes under this agreement are those defined under the General Law of Ecological Equilibrium and Environmental Protection.
Requirements for Export and Import	Notify importing country (or transit country) of transborder shipments. Regular shipments of waste from the same generator to the same site may be approved under a general notice for up to 12 months. The importing country has 30 days to indicate its consent or objection to the proposed waste shipment. If no response is received within this time frame, the implication is that the country of import has no objection to the export.	Notify importing country (or transit country) of transborder shipments. Regular shipments of waste from the same generator to the same site may be approved under a general notice for up to 12 months. The importing country has 45 days to indicate its consent or objection to the proposed waste shipment. If no response is received within this time frame, consent for export is not implied. Maquiladora companies must return all generated wastes to the country of origin, and the exporting country must receive the wastes.

Table 1 (cont.) **Comparison of the Canada/United States and the United States/Mexico Bilateral Agreements**

Primary Components	Canada/United States Agreement	United States/Mexico Agreement
Specific Tracking Document Information Requirements	• The exporter's name and address. • A description of the waste and its classification. • An estimate of the frequency of shipments. • An estimate of the total quantity of waste to be shipped. • The point of entry into the country of import. • The name and address of the transporter, the mode of transport and the types of containers. • A description of how the waste will be treated, stored, or disposed of in the importing country. • The name and address of the disposal facility. • An approximate date of the shipment.	• The exporter's name, address, telephone number, and identification number. • Physical and chemical characteristics of the hazardous waste to be exported, and its classification number. • The estimated frequency at which such waste is to be exported. • The estimated total quantity of hazardous waste. • The point of entry into the country of import. • The means of transportation. • A description of the treatment or storage to which the waste will be subjected. • EPA ID number of TSD facility. • The name and site address of the consignee. • Carrier's INE authorization.
Other Agreement previsions	Countries will cooperate in monitoring and potentially inspecting transborder movements of hazardous wasters. Parties will adopt procedures aimed at protecting confidentiality of proprietary or sensitive information. Either country can refuse entry of "environmentally harmful" hazardous waste. The exporting country must readmit any shipment returned by the importing country. Amendments are permitted and require the written consent of both countries. The Agreement is renewed every five years, unless one party requests termination.	Countries will cooperate in monitoring and potentially inspecting transborder movements of hazardous wastes. Parties will adopt procedures aimed at protecting the confidentiality of proprietary or sensitive information. Either country can refuse entry of "environmentally harmful" hazardous waste. The exporting country must readmit any shipment returned by the importing country. Amendments are permitted and require the written consent of both countries. The Agreement is perpetual, unless one party requests termination.

2.2 Domestic Statutes and Regulations

Domestic statutes and regulations incorporate the frameworks for tracking and control of transborder movement of hazardous waste as articulated in bilateral agreements. These laws require domestic waste generators, shippers, and management facilities to submit information to relevant government agencies at three stages of waste movement: (1) *prior to shipment*, generally in the form of notification to export or import (2) *during shipment*, generally in the form of waste manifest information, and (3) *after receipt* at the final treatment,storage or disposal facility, generally in the form of a management log or annual report. This life-cycle concept is useful to help us understand how provisions in various domestic statutes and regulations affect the tracking of transborder movement of hazardous waste.

Table 2 presents the principal statutes and regulations that establish tracking and control systems within each of the three countries.

2.2.1 Canada

2.2.1.1 Federal Laws and Regulations Governing Shipments of Hazardous Waste

The November 26, 1992 Export and Import of Hazardous Wastes (EIHW) Regulations under the Canadian Environmental Protection Act (CEPA) are the primary regulations for tracking transborder movements of hazardous waste into, from and through Canada. The EIHW regulations work with the Transportation of Dangerous Goods Act (TDGA) and Regulations, which controls the transportation of dangerous goods in Canada, including hazardous waste.

More specifically, the EIHW regulations establish the system to fulfill Canada's commitments under the Basel Convention, the Canada-United States Agreement on Transborder Movement of Hazardous Wastes and the OECD Decision Concerning the Transfrontier Movement of Wastes Destined for Recycling Operations. The Transportation of Dangerous Goods Act and Regulations are involved through the use of waste manifests and in transportation safety issues.

Exporters, importers and carriers undertake a number of responsibilities to be in compliance with the EIHW Regulations. These responsibilities are summarized below.[5]

First, a notice of intent to export, import or transit hazardous waste must be filed with the Transborder Movement Division of Environment Canada.[6] The notice applies to a shipment of hazardous waste between a specific generator and specific receiver to allow the notice to be evaluated and either consented or objected. The notice must contain:

- detailed information on the types and amounts of hazardous wastes being shipped;
- information on the country of origin/destination and any country of transit;
- a record of the various corporations or individuals involved in the shipment;
- information on the operations to be used in the treatment, storage, recycling and/or disposal of hazardous wastes when they reach their final destination; and
- an undertaking by a Canadian exporter that, if the disposal or recycling operation cannot take place after the export, he/she will either make other arrangements or re-import the hazardous waste.

In addition, the notice must be accompanied by proof of liability insurance and copies of the contracts identifying arrangements for the disposal or recycling of the hazardous waste.

Second, the information in the notice is reviewed by the Transborder Movement Division, and a letter of consent is issued permitting the export,import or transit provided that the conditions of the EIHW Regulation have been met. For exports, consent is subject to approval of the importing country. For imports, consent is subject to provincial confirmation and approval that the receiving facility can handle (i.e., dispose of or recycle) the waste. A notice and consent is valid for one year and can cover multiple shipments in that year.

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[5] The EIHW Regulations include different provisions for hazardous waste destined for disposal and hazardous waste destined for recycling. In addition,two levels of controls are adopted on hazardous wastes destined for recycling. Controls are relaxed for some hazardous wastes destined for recycling in countries that are party to the Canada-United States Agreement or the OECD Decision.

[6] The notice must be filed by the generator/exporter in the case of exports, recycler/disposer/importer in the case of imports,or (typically) the carrier for transit shipment. (Notices are numbered documents, and must be obtained through headquarters or regional offices of Environment Canada.)

Third, the proper documents are prepared and the hazardous waste is transported. The proper documents are: a waste manifest (bearing the corresponding notice number), the notice, and the letter of consent. These documents must accompany the hazardous waste at all times.

Fourth, copies of manifests are signed and distributed to the appropriate parties at each step of transport. This includes: the consignor sending copies to the Transborder Movement Division, the carrier depositing copies with Customs, and the consignee sending copies to the Transborder Movement Division. As such, the Transborder Movement Division receives relevant copies of the manifest at waste pick-up, waste delivery, and when waste crosses international borders. In addition, the consignee must send a statement to Environment Canada certifying that the recycling/disposal operation has occurred, within 30 days of its actually occurring.

Fifth, if the recycling/disposal operation cannot occur, it is the responsibility of the Canadian exporter to communicate this fact to the Transborder Movement Division within established time frames. The exporter must then make other arrangements to have the waste recycled or disposed by some other means, as approved by the competent authorities or, if necessary, re-import the waste.

Table 2

Principal Federal Domestic Laws and Regulations Governing Transborder Shipments of Hazardous Waste

	Canada	United States	Mexico
Before Shipment			
Governing Statute	Canadian Environmental Protection Act.	Resource Conservation and Recovery Act for imports and exports of hazardous waste. Toxic Substances Control Act for imports and exports of PCBs.	General Law of Ecological Equilibrium and Environmental Protection (LGEEPA) for hazardous waste.
Applicable Regulations	Export and Import of Hazardous Waste Regulations (Part II for disposal; Part III for recycling) for import and export of hazardous waste and import of PCBs. PCB Waste Export Regulations SOR/97-108 for exports of PCBs.	40 CFR 262.60 for imports of hazardous waste. 40 CFR 262.52 for exports of hazardous waste. TSCA (40 CFR 761.91 et seq.) for imports of PCBs.	NOM-EM-043-SCT2/1995 paperwork requirements for hazardous waste exports. Regulations of LGEEPA on hazardous waste, Chapter IV.
During Shipment			
Governing Statute	Canadian Environmental Protection Act. Transportation of Dangerous Goods Act for import and export of hazardous wastes and PCBs.	Resource Conservation and Recovery Act for imports and exports of hazardous waste. Toxic Substances Control Act for imports and exports of PCBs.	LGEEPA for manifest accompanying shipments of hazardous waste.
Applicable Regulations	Export and Import of Hazardous Waste Regulations (Part II for disposal; Part III for recycling) for import and export of hazardous waste and import of PCBs.	40 CFR 262.2 manifest regulations (imports & exports of hazardous waste and PCBs).	Hazardous Waste Regulation under LGEEPA, and relevant Mexican Official Standards.
After Shipment			
Governing Statute		Resource Conservation and Recovery Act for imports and exports of hazardous waste. Toxic Substances Control Act for imports and exports of PCBs.	General Law of Ecological Equilibrium and Environmental Protection for manifest accompanying shipments of hazardous waste.
Applicable Regulations		40 CFR 262.56 annual reports of waste exporters for hazardous waste. 40 CFR 264.75 biennial report of treatment, storage and disposal facilities. 40 CFR 761 annual reports for importers of PCBs.	Biannual reports of hazardous waste generators and waste service suppliers.

The key tracking provision regarding transborder shipments of hazardous waste is the waste manifest. Manifests are required for solid wastes in quantities of 5 kilograms or more, liquid wastes of 5 liters or more, and waste that contains more than 500 g of PCB mixture. Box 1 summarizes the manifest requirements of the TDGA and Regulations.

Box 1 — Manifest Requirements (TDG and EIHW Regulations)

Consignor (Generator)

Complete Part A of the manifest, namely:

- the consignor's provincial number (where a consignor registration program exists);
- the circulation number, for hazardous waste originating in, passing through or terminating in Quebec;
- the consignor's name and business address;
- the intended consignee's name, business address and provincial number (where a provincial number exists);
- information on the hazardous waste, including its physical state, shipping name, waste identification number(s), hazard classification, packing group, quantity shipped, type of packaging, and special handling and emergency instructions;
- the time and date shipped, and scheduled arrival date; and
- a certification that the consignor information is correct and complete.

Deliver to the carrier a copy of the manifest.

Within two days of delivery, send a copy of the manifest to:

- the designated ministry (usually environment) in the province of origin;
- if waste is staying within Canada, the designated ministry (usually environment) in the province of destination;
- if the waste is being imported or exported, Environment Canada.

Carrier

Complete Part B of the manifest, namely:

- the carrier's provincial number (where a carrier registration program exists);
- the carrier's name and business address;
- the license numbers of all vehicles, trailers, or rail cars involved in the shipment, as well as the province/territory of registration;
- the border crossing(s) at which a hazardous waste shipment enters or leaves provincial jurisdictions (where required by individual provinces); and
- a certification that the carrier information is correct and complete.

Deposit copies of the manifest with Canadian Customs at the Canada-United States border.

Consignee (Receiver)

Complete Part C of the manifest, namely:

- the consignee's provincial number (where a treatment/storage/disposal/recycling facility registration program exists);
- the consignee's name and business address;
- the time and date the hazardous waste shipment is received on the consignee's premises; information on the hazardous waste, including the quantity received, any discrepancies between the amount or type of hazardous waste reported by the consignor with that actually received, the handling code, and whether decontamination at the receiving site has occurred (where required by province/territory);
- the name, provincial number, and full address of any facility/site the hazardous waste will be re-transferred to; and
- a certification that the consignee information is correct and complete.

Within two working days of receiving the waste, send a copy of the manifest to:

- the designated ministry (usually environment) of the province of destination;
- if the waste is exported or imported, Environment Canada;
- the carrier; and
- the consignor.

Consignor, Carriers and Consignees

Maintain copies of all documentation for two years.

2.2.1.2 Federal Laws and Regulations Governing Shipments of PCB Wastes

The PCB Waste Export Regulations (SOR/97-109) under the Canadian Environmental Protection Act as amended in February, 1997 control transborder movements of PCB wastes. These PCB Waste Export Regulations are similar to the EIHW Regulations,and are administered by the same Division of Environment Canada. The Regulations now allow exports of PCB waste only to the United States, only for disposal purposes (excluding landfilling), and only under certain conditions. Therefore, PCB wastes cannot be exported to Mexico for disposal, nor can they be exported to the United States or Mexico for recycling. PCB waste is defined as:

a. any PCB liquid, PCB solid, PCB mixture, PCB equipment, PCB-contaminated soil or electrical equipment that is no longer being used in Canada; and

b. any packaging or container that has held any of the items referred to in paragraph (a), that is no longer being used in Canada and that is contaminated with 50 mg or more of PCBs per kilogram.

Also note that PCBs are defined in the List of Toxic Substances in Schedule 1 of the Canadian Environmental Protection Act.

The PCB Waste Export Regulations dictate that "no person shall export PCB waste:

a. to a country other than the United States; and

b. for any purpose other than for disposal."

The steps and conditions under which PCB waste can be exported to the United States are described below.

The exporter must provide notification of the proposed transport to the Transborder Movement Division (Environment Canada), and must receive the written approval of the Chief that either: (1) the United States EPA gives consent for the shipment to proceed; or (2) the United States EPA has not objected to the shipment within 45 days.

Notification is given using a "PCB Waste Notice" (not a notice under the Export and Import of Hazardous Wastes Regulations). The PCB Waste Notice is similar to that of the Export and Import of Hazardous Wastes Regulation, but requires verification of a TSCA import permit, as well as information concerning the type of disposal operation, and a list of destinations. The PCB Waste Notice does not have options indicating whether the waste is for export or import, or whether destined for disposal or recycling operations.

If consent is granted, information from the PCB Waste Notice is entered into the Canadian Notice and Manifest Tracking System (CNMTS), and is used for tracking and intelligence purposes. Information can be compared with that submitted on waste manifests (submitted to the Transborder Movement Division and Canadian Customs) to ensure that export has been in compliance with the regulations. Other copies of the manifest are submitted as described under the Transportation of Dangerous Goods Act and Regulations.

The exporter must also annex to the notice: (1) written contracts between the Canadian exporter and United States importer specifying the disposal operation; (2) copies of the exporter's and carrier's insurance; and (3) if requested, a copy of the EPA's written authorization to the United States importer consenting to the import.

Both the exporter and the carrier must carry liability insurance to cover any third-party damages for which the exporter or carrier is responsible, and any costs of cleaning up the environment with respect to any release of PCB waste. This insurance must cover the PCB waste from the time the waste leaves the shipping site to the time the authorized facility accepts delivery of the PCB waste for disposal. Exporters must be insured for at least $5,000,000 for each export. Insurance to be held by carriers depends on the laws of the country in which the PCB waste is carried.

The export of PCB waste requires that the following documentation accompany the shipment:

- the PCB Waste Notice (and annexed material);
- the written consent for the export from the Transborder Movement Division; and
- a waste manifest.

Copies of the manifest must be completed, signed and submitted in accordance with the Transportation of Dangerous Goods Regulations. This includes depositing, with Canadian Customs, copies of the PCB

Waste Notice, written consent for the export from the Transborder Movement Division, and the waste manifest. Information submitted to Canadian Customs can be compared, using CNMTS, with that provided in the PCB Waste Notice sent to the Transborder Movement Division.

Within 30 days of final disposal, the importer must notify, in writing, the Transborder Movement Division that the disposal operation has been completed. The certification of final disposal can again be checked against information provided in the PCB Waste Notice and waste manifests.

Where a PCB waste is exported but cannot be received or disposed of in accordance with the contract, the exporter must immediately notify the Transborder Movement Division and the United States EPA to:

- make other arrangements for the temporary storage and final disposal of the waste; or
- make arrangements for the waste to be returned to the exporter.

The temporary storage facility must be identified in the written contracts between exporter and importer.

2.2.1.3 Provincial Regulations Governing Shipments of Hazardous Waste

Generally, Canada's Provinces have jurisdiction over the following: intra-provincial movement of hazardous wastes; licensing of treatment, storage, and disposal facilities and carriers; and controls at the facility level. Federal regulations apply to international and inter-provincial movements. Generally, the federal waste manifest is used across Canada for intra-provincial movements.

Each of the four Provinces considered in this study, British Columbia, Alberta, Ontario, and Quebec, operates hazardous waste management systems under provincial directives that, while largely similar to the federal system, impose certain controls on movements of hazardous wastes and sometimes cover different wastes from those covered federally. Even so, the Canadian Export and Import of Hazardous Wastes Regulations is the one system for defining, classifying and tracking hazardous wastes involved in transborder movements. Provincial directives include:

- **British Columbia's Special Waste Regulation** (B.C. Regulation 63/88, as amended by B.C. Regulations 10/89, 106/89, 132/92, and 52/95), providing the controls for hazardous and other waste management in British Columbia. It includes provisions affecting the siting and operation of special waste facilities, and describes special waste management practices to be applied by all parties generating, carrying and receiving special waste.
- **Alberta Waste Control Regulation** (Alberta Regulation 129/93, as amended by Alberta Regulations 257/93 and 51/96). The Waste Control Regulation (WC Regulation) distinguishes between hazardous waste and hazardous recyclables. Hazardous recyclables do not require detailed manifesting of hazardous waste shipments.
- **Ontario's General Waste Management Regulation** (R.R.O. 1990, Regulation 347) under the Environmental Protection Act, affecting the movement of hazardous wastes.[7] The General Waste Management Regulation (hereafter denoted the GWM Regulation) controls the transport of waste within, out of, into, and through Ontario. Movements of hazardous and other wastes are tracked through a system of manifests. Ontario maintains its own Ontario Waste Generator Registration Database, which may be useful for intelligence information, since about half of Canada's hazardous waste is generated in Ontario.
- **Quebec Hazardous Waste Regulation** (O.C. 1000-85, as amended by O.C. 1314-88 and 588-92) under the Environmental Quality Act. In Quebec, no person may operate a hazardous waste disposal, treatment, recycling, or re-use site unless he has obtained a certificate issued by the government of Quebec, subject to any exclusion prescribed by the Environment Quality Act. Any contract for the removal, transport or storage of hazardous waste must be in writing and stipulate that the hazardous waste will be removed, transported or stored in compliance with the Environment Quality Act and Quebec's Hazardous Waste Regulation.

[7] The General Regulations (R.R.O. 1990, Regulation 261, as amended by Ontario Regulation 269/92 and 190/95) under the Dangerous Goods Transportation Act peripherally affect the transborder movements of hazardous wastes. The General Regulations specify that the transport of dangerous goods (including some hazardous wastes) be accompanied by a manifest as directed under the Transportation of Dangerous Goods Regulations (see Section 2.2.1.1). In addition,the General Regulations require that carriers hold no less than $2,000,000 in insurance.

2.2.2 United States

Three federal laws (and their regulations) govern tracking and enforcement of transborder movements of hazardous wastes in the United States:

- the 1976 Resource Conservation and Recovery Act (RCRA), as amended, and regulations in 40CFR Part 260, *et seq*.;
- the 1974 Hazardous Materials Transportation Act (HMTA), as amended, and its regulations; and
- the 1976 Toxic Substances Control Act (TCSA), as amended, and its regulations in 40 CFR Part 761.

RCRA and HMTA (and their regulations) contain the majority of the legal and administrative requirements related to tracking and enforcement of transborder shipments of hazardous waste. TSCA establishes the legal and regulatory framework governing transborder shipments of PCB wastes.

RCRA Rules for Exporting and Importing Hazardous Waste. RCRA prescribes separate processes for exporting and importing hazardous wastes. Exporting requires prior notification and consent of the receiving country. Importing requires prior notification of the intent to import. Both exporting and importing require continuous tracking of hazardous waste movement through the use of manifests and maintaining the paper trail through final disposal.

As prescribed in 40 CFR Part 262.52, notices of intent to export must include:

- name and address of the exporter;
- types and estimated amounts of hazardous wastes to be exported;
- estimate of the frequency or rate at which the waste is to be exported, and the period of time over which it is to be exported;
- ports of entry;
- description of the method of transportation to the receiving country and the treatment, storage or disposal of the waste in that country; and
- name and address of the ultimate treatment, storage and/or disposal facility.

Next, the Administrator of the United States Environmental Protection Agency (EPA), in the case of exports to Mexico through the Secretary of State, requests the consent of the receiving country, which must be received before the waste can be exported. The consent, when received, is communicated to the exporter (in the case of exports to Canada, in the form of a document issued by EPA known as an "Acknowledgment of Consent") who must attach it to the manifest.

Finally, any exporter of hazardous waste must file a report by March 1 of each year summarizing the types, quantities, frequency, and ultimate destination of all hazardous waste exported during the previous year.[8] All reports, records, the EPA acknowledgment of consent of the government of the receiving county, and the confirmation of delivery to the receiving installation must be kept on record for at least three years. Information provided in notices of intent to export and consents is maintained in EPA's Exports database (See Chapter 3).

All importers of hazardous waste must comply with all applicable requirements of RCRA and the special provisions for importing waste in 40 CFR Part 262.60. These regulations modify the information required on a standard RCRA waste manifest to include information on the foreign generator in place of the domestic generator. It is important to note that pre-notification is the responsibility of the foreign generator, while manifesting obligations in this case are placed on the importer.

Regulations at 40 CFR sections 264.12(a) and 265.12 (a) (interim statues) require the owner or operator of a United States treatment, storage or disposal (TSD) facility to "notify the Regional Administrator in writing at least four weeks in advance of the date the waste is expected to arrive at the facility. Notice of subsequent shipments of the same waste from the same foreign source is not required." Information provided in notices of intent to import is managed in EPA's WITS database (see Chapter 3).

[8] 42 U.S.C. §6938.

The Manifest System. All United States generators that ship hazardous waste off-site must prepare a manifest on a form prescribed by the regulations.[9] This manifest must name the generator and the facility, permitted under RCRA, which shall handle the waste described on the manifest. The manifest must also contain detailed information on the amount and type of hazardous waste contained in the shipment,as well as the identity of the transporter(s).

Manifests are not required to be submitted to the EPA. However, United States Customs officials have an informal agreement to forward copies of export manifests to the EPA Region VI office (Dallas, Texas), on a monthly basis, whereupon copies are forwarded to EPA's National Enforcement Investigations Center in Lakewood, Colorado. In addition, the EPA Regions VI and IX offices (San Francisco) established support programs with United States and Mexican border states in exchange for receipt of manifests (and notifications). In this manner, these EPA regional offices receive completed waste manifests from United States and Mexican border states, and from United States Customs officials.

Generators must keep copies of each manifest for three years or until receipt of a signed copy from the designated facility that received the waste, which then must be kept until three years after the facility accepted the waste. The generator also must keep copies of all reports, test results, and waste analyses for three years.

Manifests for exports to Canada and Mexico are entered into EPA's national Exports database. Manifest information regarding shipments to and from Mexico is managed in EPA's Haztraks database (see Chapter 3). Manifest information regarding shipments to and from Canada are not managed electronically at this time.

Waste Transport. Wastes either exported to or imported from Canada or Mexico must be transported within the United States in compliance with the 1974 Hazardous Materials Transportation Act (HMTA), as amended. The HMTA authorizes the Secretary of Transportation to establish and enforce hazardous material regulations for all modes of transportation including highway, rail and water. Sharing of data between the United States Department of Transportation (DOT), which is responsible for implementing HMTA, and EPA, which is responsible for tracking hazardous waste imports and exports, facilitates domestic enforcement of HMTA and RCRA, but no special HMTA regulations pertain to imports or exports. HMTA tracking systems, which are currently under development, are not nearly as important to control of the transborder movement of hazardous waste as are tracking systems developed in response to needs under RCRA.[10]

Importing and Exporting PCBs Under TSCA. Importers of PCBs into the United States must comply with Section 13 of The Toxic Substances Control Act (TSCA). Section 13 requires the Secretary of the Treasury (the executive branch within which the United States Customs Service resides) to refuse entry into the United States of shipments of any chemical substance if: (1) it fails to comply with any TSCA rule or regulation; or (2) it is offered for entry in violation of TSCA. Thus, importers must certify that the shipment is in compliance with all rules and regulations under TSCA, or that the shipment is not subject to TSCA.

TSCA regulations permit the import and export of PCBs for disposal at concentrations less than 50 parts per million (ppm). Imports of PCBs at concentrations of 50 or more ppm are allowed under amendments to TSCA that became effective in March 1996.

The requirements applicable to imports of PCBs for disposal consist of (1) the provisions of the TSCA regulations prescribing the submission of notice by the United States importer and 45-day opportunity for review, followed by tacit consent or refusal of entry, and (2) the pertinent requirements of international agreements, such as the bilateral agreements with Mexico and Canada, which provide for government-to-government notice of intent to import and opportunity for consent. In some instances, PCBs also qualify as RCRA hazardous wastes. The tracking of PCB imports for disposal is performed in the WITS database, as described in Chapter 3.

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[9] 40 CFR 262.20(a) requires that the manifest be prepared as "... a Manifest OMB control number 2050-0039 on EPA form 8700–22, and, if necessary, EPA form 8700-22A, according to the instructions included in the appendix to part 262."

[10] The United States DOT is currently developing a new computerized information exchange system with Mexico under the NAFTA Agreement to provide emergency personnel lifesaving information in the event of a hazardous materials accident. The system called "Operation RESPOND"will provide computer-based links between railroads and local emergency response organizations about the contents of hazardous materials shipments and guidance on how to respond to releases.

State Laws. RCRA authorizes states to develop and carry out their own hazardous waste program, provided the program is "equivalent" to and "consistent" with the federal program and other authorized state programs.[11] Many states establish waste management programs that reflect the federal provisions, incorporating the definitions and requirements in EPA and DOT regulations.[12] Unlike RCRA requirements, there is no provision for delegation to the states under TSCA. TSCA, therefore, is implemented by the regional offices of the EPA.

State regulations typically incorporate federal requirements by reference,[13] and require a generator or transporter to complete a waste manifest that complies with federal requirements. Waste importers also must comply with federal manifest requirements.

Some state programs regulate a wider range of wastes than the federal system. For example, California statutes authorize CalEPA to establish manifest requirements for wastes that do not require a manifest under RCRA.[14] However, the form of the manifest and the information required must be consistent with federal regulations.[15]

Several states have developed independent systems to track hazardous waste. The States of California, New Jersey, Oregon, Texas and Washington currently have active hazardous waste tracking systems. Many other states collect and compile information about generators, transporters and managers of hazardous waste but not in a systematic or computerized fashion.

In 1991, the National Governors' Association conducted a survey of state hazardous waste manifest programs. As of this date, 24 states had automated manifest tracking systems including: Washington, Oregon, California, Nevada, Texas, Oklahoma, Missouri, Louisiana,Arkansas, Illinois, Indiana, Minnesota, Wisconsin, Michigan, Pennsylvania, Delaware, New Jersey, Maryland, New York, Connecticut, Rhode Island, Massachusetts, New Hampshire and Vermont.

2.2.3 Mexico

Transborder movement of hazardous waste is governed by the provisions of Mexico's General Law of Ecological Equilibrium and Environmental Protection (LGEEPA), published on January 28, 1988 and amended on December 13, 1996. Title 4, Chapter V, Articles 150 to 153 present the general requirements regarding hazardous wastes, including imports, exports and returns. Article 153, Chapter V of LGEEPA establishes a general framework for transborder movement of hazardous wastes including the following:

- hazardous wastes can be imported for treatment, recycling or reuse as long as waste handling and management comply with all applicable laws;
- hazardous waste may be exported only upon consent of the receiving country;
- hazardous wastes and materials generated in processes where raw materials were imported to Mexico under temporary import permits shall be returned to the country of origin; and
- authorizations for import/export can be canceled pursuant to Section VIII of Article 153 of LGEEPA.

Regulations of LGEEPA on hazardous waste establish definitions, attributions, powers, general procedures, norms and standards regarding hazardous waste management. Articles 43 through 57 deal with imports, exports and returns of hazardous waste.

On April 7, 1993, Regulation on Terrestrial Transport of Hazardous Waste and Materials was issued. These regulations implement United Nations recommendations on the transportation of hazardous wastes and materials. These regulations cover:

- classification of hazardous wastes and substances;

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[11] RCRA §3006, 40 CFR Part 271.

[12] For example, Indiana requires transporters to complete the United States EPA hazardous waste manifest forms. 329 Indiana Annotated Code § 3.1-7-7-7.

[13] *See, e.g.*, Cal.Rev.Stat. Article 6, §25160(d); 329 Indiana Annotated Code § 3.1-7-7-7; Kansas Admin.Reg. §28-31-4; Maine Regulation §§ 06-096-857(5)(B), (7)(C), (7)(D) (1996); N.C. Admin.Code §13A.0007; Wyo. Reg. §020-110-008.

[14] Cal.Rev.Stat. Article 6, §25160(b)(4).

[15] *Id.*

- packing and labeling requirements of hazardous wastes;
- specifications for transportation equipment;
- identification of transporting units;
- transportation safety requirements;
- provisions for inspection of transporting equipment;
- shipment requirements;
- documentation for the national emergency response during transportation of hazardous wastes and materials;
- responsibilities and obligations of the generator and receiver of the hazardous wastes and materials; and
- training and fines.

Mexican Norms. In accordance with Article 36 of LGEEPA, Mexican Official Norms (NOM) are a set of scientific and technical regulations issued to establish the requirements, specifications, conditions, procedures, and permissible limits for compliance during the implementation of activities that can cause ecological unbalance or environmental damage. These regulations establish general criteria regarding the management of hazardous wastes.

Their principal objective is to determine the parameters under which compliance can be guaranteed and human health and the environment can be protected, preserved, and restored. On October 22, 1993, the *Diario Oficial* published the following seven NOMs regarding hazardous waste, while Norm-087 was published on November 7:

NOM-052-ECOL-1993	Establishes characteristics of hazardous wastes and their listings.
NOM-053-ECOL-1993	Establishes procedures and protocols to determine the characteristics that make toxic wastes hazardous.
NOM-054-ECOL-1993	Establishes procedures to determine the incompatibility of two or more hazardous wastes.
NOM-055-ECOL-1993	Establishes the requirements for hazardous wastes disposal sites (controlled confinement), except for radioactive wastes.
NOM-056-ECOL-1993	Establishes design requirements for additional works required for the controlled confinement of hazardous wastes.
NOM-057-ECOL-1993	Establishes the requirements during design, construction and operation of controlled hazardous wastes confinement cells.
NOM-058-ECOL-1993	Establishes the requirements for the operation of a controlled hazardous wastes confinement facility.
NOM-087-ECOL-1993	Establishes the requirements for classification, separation, packing, storage, collection, transportation, treatment and final disposal of hazardous biological infectious wastes generated in medical facilities.

Important Institutions. Tracking of hazardous waste generation and management as well as law enforcement in Mexico is handled exclusively at the federal level. The *Secretaría de Medio Ambiente, Recursos Naturales y Pesca* (Semarnap), is the responsible authority through the *Instituto Nacional de Ecología* (INE) and *Procuraduría Federal de Protección al Ambiente* (Profepa). Roughly, INE is the policy-making organization while Profepa is responsible for enforcement.

INE maintains all systems for tracking transborder shipments of hazardous waste. Likewise, INE issues import and export authorizations for hazardous waste. Profepa designs and implements enforcement systems based mainly on public complaints and direct inspections of facilities. These enforcement systems document conditions of compliance for waste generators and companies engaged in the hazardous waste handling.

The *Secretaría de Comunicaciones y Transportes* (SCT) is the federal agency responsible for national and transborder transport of hazardous waste. This agency has its own register of authorized companies for hazardous waste transportation.

The *Secretaría de Comercio y Fomento Industrial* (Secofi) registers quantities of hazardous materials imported into Mexico as raw materials for production or assembly as well as hazardous wastes that result from such production, which must be exported to the country of origin for waste management.

The *Secretaría de Hacienda y Crédito Publico* (SHCP) registers all materials that cross through border Customs facilities. Customs identifies materials using Secofi's classification codes.

Existing Tracking Systems. Mexico is devising several computerized systems for tracking hazardous waste shipments: the National Hazardous Waste Tracking System for Transborder Movements between Mexico and the United States (Haztraks); a separate system that will monitor all waste shipments within the country; and the National Register of Hazardous Waste Generating Companies (*Registro Nacional de Empresas Generadoras de Residuos Peligrosos*), a database to monitor hazardous waste generating companies and management within Mexico. Each of these systems is in different stages of implementation and operation.

Some of the Profepa delegations in the northern states of the country (Baja California, Chihuahua, and Sonora, for example) have implemented limited computerized systems (different from Haztraks) to enforce hazardous waste laws.

Tracking Before Shipment. Transborder movement is initiated when the waste generator presents an import/export application to INE headquarters or the Semarnap bureaus in the border states. Once authorization is granted by means of a permit to export or import (in Spanish, a *Guía Ecológica*), shipments must take place within 90 days. The *guía* must be attached to the shipping manifest for the import/export of hazardous wastes and materials. *Guías* are entered into Haztraks monthly. Applications for *guías* must include the following information:

- address of applicant;
- applicant's land use permit;
- route that is planned to move the hazardous wastes from the generator to final disposal, including all cities;
- information about the transporter, including: name, company, type of transportation, type of containers, and authorization from SCT and INE for the transportation of hazardous wastes;
- technical specifications of the hazardous wastes, including: composition, physical, chemical and toxic properties;
- flow diagrams where hazardous wastes will be utilized, indicating emissions to air and water, and final wastes produced;
- copies of the by-laws of the importer/exporter company;
- federal tax I.D. number of the importer/exporter company;
- list of recycling centers with names, addresses and telephone numbers;
- emergency response measures in case of an accident or spills;
- notification format for export from CODEE and/or Basel format (supplied by INE);
- a letter of acceptance of the hazardous wastes from the facilities in the country of final destination; and
- a bond placed with Semarnap as the beneficiary for the amount indicated by INE and good for 90 days starting the same date as the authorization for import/export. This bond is to guarantee compliance with the conditions of the authorization as required by Article 153, Section 7 of the LGEEPA and Article 47 of the hazardous wastes regulation.

Tracking During Shipment. All shipments of hazardous waste in Mexico must be accompanied by a manifest. The Mexican manifest system is structured similarly to the United States system, where the manifest document is signed and passed on to all participants in the waste management chain, including waste generator, shipper and management facility.

At the border, Mexican Customs will require a *guía* as evidence of Semarnap's authorization to export the shipment. If it is not available, the shipment may be detained and Profepa will be notified.

After Shipment: Once the shipment crosses the border and is delivered to the final disposal site, the receiver must sign the reception manifest, keep a copy, and return the original and the other copies to the transporter. The transporter will keep a copy and should return the original and one copy to the generator.

The generator must report the shipment to Semarnap within 15 days of completion. Part of this notification is a disclosure of actual quantities shipped. Generators keep all original manifests and copies, as signed by transporters and the ultimate disposal facilities. These records must be available to Profepa inspectors upon request.

Resources Used to Track Waste Movements. Resources available for registration and tracking of hazardous wastes in Mexico include:

- haztraks software and hardware in the central offices of INE used to track hazardous wastes;
- two computer experts who assist local staff and support coordination and communication with EPA;
- software and hardware at each Semarnap border delegation;
- two staff members at the central office of INE in the Department of Transborder Movements and one staff member at each border delegation; and
- two computer experts at central offices of INE in the Department of Transborder Movements and one person at each border delegation for the electronic capture of information from the different manifests.

2.3 An Overview of North American Transborder Trade in Hazardous Waste

No single source of waste flow data among the United States, Mexico and Canada currently exists. Yet, a reasonable view of waste flow can be pieced together from a variety of sources. Interestingly, each country's view of waste flow differs somewhat from the others'. Part of this difference is attributable to the three different definitions of hazardous waste in the United States, Mexico and Canada. Part of it may also be attributable to the systems in place in each of the three countries to record the import and export of hazardous waste and the confidentiality with which each country treats such information.

Information presented in this section is based on records of legal shipments of hazardous waste. One can only guess about the size of illegal shipments across international borders. Many consider this one of the key issues with respect to the enforcement of laws and regulations governing transborder movement of hazardous waste.

2.3.1 United States Statistics

Imports from Mexico. While Mexican officials believe that hazardous waste shipment data reported by United States Customs are inaccurate, according to hazardous waste manifests collected from that agency at ports of entry, the United States received 2,570 tons of hazardous waste from Mexico in 1996.[16] This figure is down from the 12,255 tons of hazardous waste received in 1995 (the peak since 1990). The vast majority of such waste is bound for treatment, storage and disposal (TSD) facilities in California (50%), Texas (28%), Arizona (4%), and Arkansas (4%).

Exports to Mexico. The United States, in contrast, shipped about 17,000 tons of hazardous waste to Mexico in 1996. This figure is down dramatically from its recent peak in 1993 of 68,000 tons of hazardous waste exports from the United States to Mexico.

Imports from Canada. United States statistics on imports of hazardous waste from Canada are not readily available from published sources.

Exports to Canada. According to the most recent data available from EPA's Export database, the United States shipped about 91,883 tons of hazardous waste to Canada in 1993.[17] Preliminary data indicate that United States exports to Canada in 1994 could have been as high as 157,000 tons. About 43% of the hazardous waste shipped in 1993 were sludges containing metals, organics or paints, or incinerator ash bound for treatment and/or landfill. Another 25% was comprised of lead-acid batteries bound for lead recovery. Some 15% are ignitable liquids going to incineration.

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[16] United States Environmental Protection Agency, *Haztraks Users Manual, Version 96.* (no date).

[17] Note that these estimates are generally thought to be inflated relative to manifest information since EPA's Export database derives its information from pre-notifications of intent to export, which often identify significantly more waste than is actually shipped according to manifests.

2.3.2 Canadian Statistics

Imports from the United States According to statistics provided by the Transborder Movement Division of Environment Canada and the Pollution Prevention and Control Division of the Environmental Directorate of OECD, Canada received 416,244 tons of hazardous waste from the United States in 1995.[18] Some 70% of this waste was recycled. Leachable toxic wastes and corrosive liquids comprised 60% of the imported waste flow.

Exports to the United States Canada exported an estimated 248,600 tons of hazardous waste to the United States in 1995. About half was recycled and half was treated and/or disposed.

Shipments To/From Mexico. Canadian sources have no records of shipments received from or sent to Mexico.

2.3.3 Mexican Statistics

While not currently available, statistics on transborder movement of hazardous waste are expected to be available shortly on INE's website (<http://www.ine.gob.mx>).

[18] Converted to United States tons from data in: Environment Canada, Transborder Movement Division of the Hazardous Waste Branch, *Resilog*, Vol. 10, No. 1, December 1996.

3 Characteristics and Limitations of Current Systems to Track Transborder Movement of Hazardous Waste

Material presented in this chapter is drawn from analyses of existing law, regulations and practice with regard to the transborder movement of hazardous waste as well as a series of interviews with more than 50 United States, Mexican and Canadian officials in this field. A list of officials interviewed is presented as Appendix B to this report. Not all those interviewed would necessarily agree with each issue raised in this chapter, since issues are summarized across a wide variety of perspectives including federal and state/provincial enforcement officials, their administrative and policy-making counterparts, Customs officials, and others knowledgeable in the field of tracking systems and enforcement of transborder hazardous waste management laws.

With one notable exception, current tracking systems have been developed unilaterally in response to the needs under domestic statutes and regulations. Opportunities may exist, therefore, to improve sharing among trading partners of information in these tracking systems to, in turn, improve each nation's ability to enforce laws that address transborder movement of hazardous waste. In addition, opportunities may exist in the broadening of Haztraks, a bilaterally developed system of tracking waste shipments across the United States-Mexico border. These opportunities are discussed in Chapter 4.

3.1 Overview

As presented in Chapter II, it is useful to characterize tracking systems as they apply to hazardous waste (1) *before shipment*, (2) *during shipment*, and (3) *after shipment*. This life-cycle characterization helps rationalize the design of certain tracking systems and helps explain their utility for enforcement of domestic hazardous waste management laws. At each stage, theoretically, enforcement agencies across borders should be able to compare information from both exporting and importing perspectives on individual shipments and on activities over time of an individual participant—generator, shipper, transporter, or management facility—in the life-cycle management of hazardous waste.[19]

Systems that handle information *before shipment* focus on pre-notification of intent to export or import, sometimes acknowledgment of receipt of notification, consent of that prospective activity, and sometimes acknowledgment of receipt of consent. Exchange of this information typically takes place among government agencies and is inexact with respect to waste types, quantities, frequency of shipment, and ultimate disposition. In large measure, information at this stage is a proposal and not necessarily representative of what eventually gets shipped. Instead, notifications indicate estimated volumes for one or more shipments over a period of time, usually 12 months.

Systems that handle information *during shipment* contain information drawn from waste manifests, such as exact types and quantities of waste being shipped, identification of the generator (or shipper), identification of the intended recipient, intended ports of entry, and intended management method. These data are supposed to be precise and travel with each shipment of waste from "cradle to grave." These systems require private participants in the waste management cycle to interact with multiple government agencies at the federal level (regulatory and Customs, for example) and at the state/provincial level.

The third type of system handles information about waste management *after shipment*. These data generally are not tracked, *per se*, but are submitted to regulatory agencies as annual or biennial reports. Data in these reports include, for example, annual total quantities of each type of waste handled, annual quantities received from (or shipped to) certain generators (or management facilities), and how these shipments ultimately were managed. With respect to enforcement of transborder movement of hazardous waste, their value is in corroboration of information provided in the first two steps.

[19] In practice, this type of comparison often is impossible. Why such comparisons are difficult is the subject of this chapter. Suggestions for improving tracking systems to support such comparisons and other enforcement efforts is the subject of Chapter 5.

3.2 The Canadian Notice and Manifest Tracking System (CNMTS)

Maintained by the Transborder Movement Division of Enviroment Canada, the Canadian Notice and Manifest Tracking System (CNMTS) is Canada's principal system for tracking the movement of hazardous waste and PCBs. It holds and manipulates information drawn from notices of intent to export or import hazardous waste or PCBs and corresponding waste manifests. As such, it tracks information *before* and *during* shipment. Canada does not require that its hazardous waste management facilities submit annual reports, and thus, has no formal reporting of waste handling *after* shipment.

Since CNMTS is capable of searching for and linking information about companies, types of wastes, compliance records, and other variables, it is used to manage a wide variety of government commitments relating to the management of hazardous wastes, including:

- tracking notices;
- tracking manifests;
- responding to client inquiries;
- searching for historical information; and
- producing standardized reports.

CNMTS consists of nine workstations and three servers, operated by three Notice Officers, three Manifest Officers, and one System Manager. It has been modified several times to improve and expand the services it offers since it was first used in 1990. The last major upgrade was completed in 1996. At that time, enhanced ad hoc querying capacity was introduced as an element of CNMTS, as well as real-time access for enforcement personnel and modem access to file status for notifiers. Several more recent projects are geared toward the enhancement of electronic transmission of notice and manifest data.

3.2.1 Notifications and the CNMTS

Currently, information from notices (received by mail and fax) is input manually into the CNMTS within three days of receipt and is then available in electronic form. A test program has been in place since July 1994 to permit the use of electronic data interchange (EDI) to transmit import notices. The CNMTS plays a central role in managing the automated processing and in approval or rejection, monitoring, and tracking of notices. For each of the 6,500 notices and 33,000 shipments it tracks each year, CNMTS holds information regarding:

- proof of written contracts and insurance;
- types and amounts of hazardous wastes expected to be shipped;
- country of origin/destination and any country of transit;
- various corporations or individuals involved in the shipment;
- the operation used in the treatment, storage, recycling and/or disposal of hazardous wastes when they reach their final destination; and
- an undertaking by a Canadian exporter that, if the disposal or recycling operation cannot take place after the export, he/she will either make other arrangements or re-import the hazardous waste.

3.2.2 Manifests and the CNMTS

Manifests are submitted by waste generators (consignors), transporters and receivers (consignees) to the Transborder Movement Division at various times during the life cycle of waste management. CNMTS plays a central role in managing information provided in these manifests, including:

- tracking detailed information on the types and amounts of hazardous wastes being shipped;
- recording the various firms or individuals involved in the shipment; and
- providing information on the treatment, storage and/or disposal of hazardous wastes when they reach their final destination.

CNMTS also allows information provided at various stages in the waste transport to be correlated against that at other stages, with information provided in the notice, and with historical information about firms. CNMTS also tracks data from related foreign export notices for Canadian imports. As much as possible, these are linked with their corresponding import notices.

As carriers transporting waste into Canada cross the Canada-United States border, they must deposit with Canadian Customs inspectors copies of the notice, letter of consent and Canadian waste manifest. Canadian Customs inspectors verify that all documents are provided and information is complete and consistent across the notice, letter of consent and manifest.[20]

If documentation is not in order, Customs inspectors notify Environment Canada for direction. Environment Canada officials may then access CNMTS, conduct inspections or take other actions as necessary. While Customs inspectors at the border do not have access to CNMTS (nor do they handle shipments), a project to link Customs and CNMTS is underway. Real-time linkage is available to Customs intelligence personnel.

Intelligence from Environment Canada enforcement can be fed into a computerized database run by Customs for all shipments (waste and non-waste). For each import, Customs inspectors enter shipment identification information into a computerized database used for statistics and enforcement. Enforcement agencies, including Environment Canada inspectors, can enter "flags" that appear to Customs inspectors warning them of high-risk shipments (i.e., shipments with high risk of being out of compliance with any Canadian law or regulation). The flags include risk ratings, the nature of the risk and instructions (e.g., "Importer may be importing hazardous waste illegally. Detain shipment and contact nearest Environment Canada office.") Environment Canada's Office of Enforcement also gathers intelligence and conducts investigations. Violations are often first detected by tips from the violator's competitors, employees of the violating company and Customs inspectors' verification of documentation.

3.3 Tracking Systems in the United States

At the national level the United States maintains five separate systems to track potential and actual transborder movements of hazardous waste:

Before Shipment:

- EPA's WITS database for tracking notices of intent to import hazardous waste, and
- EPA's Hazardous Waste Export database for tracking notices of intent to export hazardous waste.

During Shipment:

- Haztraks for tracking notices and actual shipments (manifests) of hazardous waste across the United States-Mexico border, and
- EPA's hazardous waste Exports database for tracking actual shipments (manifests) of hazardous waste across the United States-Canada and United States-Mexico borders.

After Shipment:

- EPA's hazardous waste Exports database for tracking Annual Reports of RCRA-permitted hazardous waste generators and shippers (so called, "primary exporters") summarizing waste exported during the year, and
- Annual reports to EPA (TSCA Enforcement Office) of facilities managing imported PCBs. (Biennial reports for all other types of hazardous waste imports are required under RCRA).

In addition, several states have developed independent systems to track hazardous waste movement. The States of California, New Jersey, Oregon, Texas, and Washington currently have active hazardous waste tracking systems. Many other states collect and compile information about generators, transporters, and managers of hazardous waste but not in a systematic or computerized fashion.

3.3.1 EPA's WITS Database

Under the United States-Mexico and the United States-Canada bilateral agreements, Mexico and Canada must pre-notify the United States of intent to ship hazardous waste to an United States facility. The United States must consent to this shipment before it can enter the country. Under TSCA, United States importers of

[20] A formal agreement between Revenue Canada (responsible for Canadian Customs) and Environment Canada stipulates the responsibilities of each relating to transborder shipments of hazardous waste.

PCBs must notify EPA of their intent to import at least 45 days before shipment. EPA then approves or rejects this request based on the characteristics and compliance history of the intended management facility.

Information received from Mexico and Canada in their export pre-notification forms (in the case of Mexico, based on OECD forms) plus information received from United States PCB importers in their pre-notifications is managed by EPA's Office of Enforcement and Compliance Assurance in Washington DC on the Waste Import Tracking System of WITS database (formerly the "Imports" database).

The United States accepts the form of notice used by each of its neighbors in the case of hazardous waste. Both include the following information:

- name of foreign exporter,
- type and quantity of waste expected to be shipped,
- expected port of entry,
- expected United States recipient, and
- dates of expected shipments.

United States PCB importers must specify all possible recipient facilities to which the PCBs may be shipped, but are not required to specify the exact facility.

The WITS database is PC-based, Lan-served, and relational (using Visual Basic). When fully operational with reporting functionality and graphics, it will be available in read-only access throughout EPA headquarters and regional offices.

3.3.2 EPA's Hazardous Waste Exports Database

Under RCRA, hazardous waste exporters must first give notice to the EPA of intent to export. After review for sufficiency, the United States shares the notification of intent to export with either Mexico or Canada (depending on the destination) and receives consent or rejection of the proposed shipment. EPA stores this information in its Exports database, currently maintained at the National Environmental Information Center (a branch of EPA's Office of Enforcement and Compliance Assurance) in Denver. This database holds the following information for each potential export shipment:

- the name and address of the exporter;
- the types and estimated amounts of hazardous wastes to be exported;
- an estimate of the frequency or rate at which the waste is to be exported, and the period of time over which it is to be exported;
- the ports of entry;
- a description of the method of transportation to the receiving country and the treatment, storage or disposal of the waste in that country; and
- the name and address of the ultimate treatment, storage and/or disposal facility.

Exports also holds information drawn from export manifests and from annual reports filed by exporters.

The Exports database is maintained in focus on a mainframe computer located in EPA's offices in Raleigh, North Carolina. Periodically, EPA uses data in Exports to generate reports summarizing trends in exports of hazardous waste. These data also are used for enforcement purposes to identify non-filers, late filers and mis-filers of required RCRA notices. Rarely are these data used in connection with actual manifest data.

3.3.3 Haztraks

In November 1990, the United States and Mexico agreed to develop an Integrated Border Environmental Plan (IBEP) to monitor transborder movements of hazardous waste. An important component of IBEP was to be the creation of a database to provide electronic support for transborder tracking and enforcement activities.

In October 1992, the United States EPA in partnership with the Mexican Secretariat of Ambient, Natural Resources, and Fisheries (Semarnap) developed the Hazardous Waste Tracking System (Haztraks) to facilitate the tracking of transborder movements of hazardous wastes. Haztraks tracks volumes and types of

hazardous waste crossing the United States-Mexican border, and enables the EPA and the Mexican National Institute for Ecology (INE) to monitor data through an automated system.[21]

By correlating data from United States and Mexican waste manifests (and other sources),[22] Haztraks provides an integrated system for tracking waste between the two countries. This represents an important step, since differences in national tracking systems previously meant that hazardous shipments lost their identity at the border.

Definitions of Hazardous Waste. No standardized definition of hazardous wastes exist for the purposes of Haztraks. Rather, both the United States and Mexican definitions (as described in other sections of this report) apply.

Tracking Hazardous Wastes With Haztraks. Haztraks manages information from the following sources: (1) United States Uniform Hazardous Waste Manifests required under RCRA, (2) United States treatment-storage-disposal notices of intent to receive foreign-generated waste required under RCRA, (3) Mexican *Guías Ecológicas*, Mexico's permits to ship waste out of the country, and (4) data (principally identification) on United States RCRA - permitted treatment, storage and disposal (TSD) facilities. Haztraks allows four types of origin-destination flows to be tracked with information accessible by both United States and Mexican officials:

- maquiladora waste shipments from Mexico to the United States;
- non-maquiladora waste shipments from Mexico to the United States;
- hazardous waste shipments from the United States to Mexico;[23] and
- hazardous material shipments from the United States to Mexico.

Below, the mechanisms supporting tracking of transborder hazardous waste shipments for these four flows are described.[24]

Maquiladora Waste Shipments from Mexico to the United States

1. The maquiladora requests from the state bureaus of the Semarnap or from the National Institute of Ecology (INE) authorization for the return of hazardous waste (an ecological guide, or *guía ecológica*) by submitting the hazardous waste import or export manifest. This information is then entered into the Haztraks database.
2. The United States Treatment-Storage-Disposal facility notifies the EPA (using a notice from the maquiladora), which enters data from the notice into the Haztraks database.
3. During transport, United States Customs sends a copy of the manifest to the EPA, where it is entered into the Haztraks database.
4. The Treatment-Storage-Disposal facility forwards a copy of the manifest to the state agency, which forwards the manifest to the EPA, where any new data is entered into the Haztraks database.

Non-Maquiladora Waste Shipments from Mexico to the United States

1. The National Institute of Ecology submits a Diplomatic Notice of Intent to the EPA on behalf of the non-maquiladora generator.
2. The EPA reviews the diplomatic notice, and may respond with an Acknowledgment of Consent.
3. Upon receipt of an Acknowledgment of Consent, the National Institute of Ecology provides the non-maquiladora generator with an export *guía*.
4. The same agencies are provided with copies of the manifests as for maquiladora waste shipments to the United States.

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[21] To date, Haztraks has been used primarily to monitor transborder waste originating in Mexican Maquiladora facilities and destined for disposal in the US. Maquiladora facilities are Mexican manufacturing and assembly plants which are owned by foreign (often United States) companies. Mexican law and the United States/Mexico Bilateral Agreement requires that hazardous waste generated in the maquiladora be exported to the country of ownership.

[22] Other sources may include United States TSD facility notifications of intent to receive hazardous waste.

[23] Only United States hazardous waste destined for recycling operations can be imported into Mexico.

[24] This report describes the differences between United States and Mexican definitions of hazardous waste. For instance, according to Mexican definitions, approximately 30,000 tons of hazardous waste was exported to the United States in 1995. Using the United States definitions, only 11,000 tons of hazardous waste was imported from Mexico.

Hazardous Waste Shipments (for recycling only) from the United States to Mexico

1. The United States generator submits a Notification of Intent to Export to the EPA, which may issue an Acknowledgment of Consent for the export.
2. The Mexican receiver submits a *guía* application to the National Institute of Ecology, which may issue an import *guía* approving the shipment.
3. The generator sends a copy of the manifest to the state agency (which forwards it to the EPA), and United States Customs sends a copy of the manifest to the EPA, where both are entered into the Haztraks database.
4. The National Institute of Ecology enters data from the import *guía* into Haztraks.

Hazardous Material Shipments from the United States to Mexico

1. The maquiladora notifies the Mexican Intersectorial Commission for the Control of Processing and Use of Pesticides, Fertilizers, and Toxic Substances of its intent to import hazardous materials from the United States.
2. The Mexican Intersectorial Commission for the Control of Processing and Use of Pesticides, Fertilizers, and Toxic Substances may issue an import *guía* approving the import.
3. The Mexican Intersectorial Commission for the Control of Processing and Use of Pesticides, Fertilizers, and Toxic Substances (through the National Institute of Ecology) enters the data from the import *guía* into Haztraks.

Enforcement Using Haztraks. The Haztraks system provides enforcement officials information on waste movements that may be useful for monitoring compliance with United States and Mexican regulatory provisions and taking certain enforcement actions. Currently, however, full advantage is not taken of this information.

The amalgamation and analysis of information from manifests, *guía*, notices, permit compliance records and pre-notification reports provides authorities with information relating to:

- current notification procedures;
- current manifests;
- current submissions of documentation;
- past compliance records;
- final recycling/disposal activities; and
- typical areas of non-compliance, such as non-filing, late filing and mis-filing of required notices and manifests.

Future improvements to the system may allow additional enforcement activities to occur, especially as related to increasing the detail of information received, increasing the timeliness of information received, and expanding the program to include other shipments (including shipments of other types of substances, and shipments to and from other areas).

3.3.4 Annual and Biennial Reports of Generators, Treatment, Storage, and Disposal Facilities

Two types of annual reports available to United States officials provide information on transborder shipments of hazardous waste and PCBs *after the shipments have taken place*. As such, they can be useful to corroborate information provided in advance of and during shipment.

Pursuant to RCRA, 40 CFR 264.75 and 40 CFR 265.75, United States RCRA-permitted TSD facilities must file a report every two years (on each even-numbered year) summarizing information regarding hazardous waste they received from foreign sources during the previous two years. These reports cover: the name and address of each foreign generator; description and quantity of each hazardous waste received; method of treatment, storage and/or disposal; and other information related to their RCRA permit, but not necessarily related to tracking transborder movement of hazardous waste.

Also pursuant to RCRA, but under 40 CFR 262.56, primary exporters (defined as both generators that export directly and shippers that perform this service for multiple generators) of hazardous waste are required to file with EPA by March 1 of each year, a report summarizing the types, quantities, frequency, and ultimate destination (name and address of foreign firm) of all hazardous waste exported during the previous calendar year.

3.3.5 State Tracking Systems

In 1991, the National Governors' Association conducted a survey of state hazardous waste manifest programs. They found that 24 states had automated manifest tracking systems, including: Washington, Oregon, California, Nevada, Texas, Oklahoma, Missouri, Louisiana, Arkansas, Illinois, Indiana, Minnesota, Wisconsin, Michigan, Pennsylvania, Delaware, New Jersey, Maryland, New York, Connecticut, Rhode Island, Massachusetts, New Hampshire and Vermont. Examples from the states of Texas, New Jersey, Oregon and Washington follow.

Texas has developed a system they refer to as TRACS (TNRCC Regulatory Activities Compliance System). TRACS is a Unix-Based system that operates independently from Haztraks to produce reports on all hazardous waste shipments into, out of and through the State of Texas.[25] Monthly filing reports are required of shippers and receivers of hazardous waste. Annual reports are supplied by generators. Beginning in 1996, maquiladora facilities in Mexico are required to report annually on their hazardous waste shipments into and through Texas. TRACS is capable of producing reports by generator, shipper or receiver. Reports include: annual waste records by generator; individual waste shipment reports by generator/shipper; monthly waste receipt records; and reference tables for out-of-state codes. Information related to enforcement or compliance is not contained in TRACS.

New Jersey operates a computerized hazardous waste tracking system called the Manifest Tracking System. The system is used to ensure that shipments reach their intended destination, provide information to field inspectors for enforcement, provide marketing information to private businesses, supply EPA with required reports, help build enforcement cases against potential violators, prepare customized reports for instate use, respond to public information requests, plan for hazardous waste management capacity, and identify all facilities and shippers of hazardous wastes. The system operates on an IBM mainframe computer. Additional state-required information (including differing waste codes) is entered from the federal manifests. Problems with the system include the ability to identify specific foreign country facilities, and the backlog of manifests to enter and crosscheck.[26]

The States of Oregon and Washington have developed similar systems to track hazardous wastes. The system is called HWIMSY (Hazardous Waste Information Management System). This hazardous waste tracking system was created by an independent software vendor. The State of Washington requires annual reports by TSD facility operators (RCRA requires biennial reports). The annual and biennial reports include:

- the generator's EPA identification number;
- the EPA identification number for each transporter used;
- the EPA identification number for each designated facility where hazardous waste was sent;
- a description and accounting of the quantity of hazardous waste generated; and
- a report on effort taken to reduce the volume and toxicity of waste generated and the reduction achieved based on previous years.

This information is supplemented with the information contained in the Uniform Hazardous Waste Manifest (EPA Form 8700-22), which is entered into HWIMSY. One problem that has been noted with the current reporting system is the foreign country code. Each facility in a foreign country is assigned the same code numbers so that waste streams to and from individual facilities cannot be tracked. Information related to enforcement or compliance is not contained in HWIMSY.[27]

[25] Personal communication, Christy Dunn, Texas Natural Resources Conservation Commission (TNRCC).

[26] Personal communication, Ferdinand Scaccetti, New Jersey Department of Environmental Protection (NJDEP).

[27] Personal communication, Daniel Kruger, Washington Department of Ecology (WDOE).

3.4 Tracking Systems in Mexico

Waste tracking in Mexico is based on private applications for permits to export or *Guía Ecológicas* (Ecological Guides) and government issuance of *guías*. The *guía*, which must be forwarded to the Mexican Secretary of Environment, Natural Resources, and Fisheries (INE) at least 90 days prior to shipping, includes a waste manifest, and transport and acceptance of hazardous residue forms. The waste manifest includes information similar to that found on United States waste manifests.

Information on each *guía* is entered into the Haztraks database and thereby forms the core of the Mexican tracking system. All information available through Haztraks in the United States (see above) also is available for purposes of enforcement in Mexico.

In addition, Profepa maintains a hazardous waste tracking database called *Sistema Integral de Seguimiento Ambiental a la Industria.* It tracks *guías ecológicas*, Mexican waste transport manifests, and information on generators and transporters. This system reportedly is used to determine whether actual waste shipments conform to the provisions of the *guía*, which is issued prior to shipment.

4 Limitations of Existing Tracking Systems for Enforcement Purposes

This chapter examines whether and to what extent existing tracking systems either currently support enforcement efforts, or are limited in their ability to do so. It examines issues of compatibility of tracking systems within a country and across borders, the quantity, reliability and timing of information housed on existing systems, the differences between tracking system information and intelligence, and other issues.

4.1 Compatibility of Tracking Databases

Two types of opportunities frame the issues of compatibility of waste tracking databases:

- Are the tracking systems within a single country compatible insofar as they support the enforcement of domestic requirements and international agreements for transborder shipment of hazardous waste?
- Are the tracking systems across borders compatible for these same purposes?

The first question is relevant principally within the United States, which supports multiple tracking systems. In Canada, a single tracking system at the national level handles much of the same data maintained in at least four separate United States systems. Mexico maintains only the Haztraks system for tracking transborder waste movements, so compatibility of domestic tracking systems is not an issue. Yet, some Mexican officials have suggested that the National Register of Hazardous Waste Generating Companies (*Registro Nacional de Empresas Generadoras de Residuos Peligrosos*), which is used to control and manage hazardous waste generation within Mexico, could be used in conjunction with Haztraks to strengthen enforcement of both domestic laws and international agreements. Currently, these two data sources are not linked. Haztraks data are maintained by INE, so when Profepa wants to take an enforcement action, it must request information from INE. Apparently, this process is cumbersome.

4.1.1 Compatibility of Multiple United States Tracking Systems

United States tracking systems do not interact well with each other. According to United States enforcement officials that maintain and/or use the WITS and Exports databases, WITS is not linked to raw manifest information and neither is linked to the Haztraks database. A Memorandum of Understanding (MOU) has been signed between EPA and United States Customs, whereby Customs would collect manifests from importers and pass them on to EPA's Office of Enforcement and Compliance Assurance in Washington. But that MOU is only a few months old and the exchange process has not yet begun. A similar MOU apparently has been signed with certain states (Michigan was offered as an example).

The process for sharing information among WITS, Exports, Haztraks, and annual/biennial reports appears to be informal, at best. EPA headquarters staff that need information on actual shipments must call the Haztraks administrators either in Region VI (Dallas) or IX (San Francisco) and ask them to research a specific shipment. While currently WITS information is available to other offices within EPA only by request, this system is expected to change shortly with the release of a read-only version for use within EPA.

WITS administrators are currently unaware of and consequently are not using biennial reports on imports received by RCRA-permitted facilities.[28] Administrators cited this as a problem that reduced the effectiveness of WITS data for purposes of enforcement. Specifically, while WITS provides a window on what is intended to be shipped to the United States and Haztraks provides an account of what was actually shipped, EPA is unable to cross-check this information with reports of waste received by RCRA-permitted facilities from foreign sources. Annual reports are required on PCB imports, but since 1997 was the first year of this requirement, their effectiveness for enforcement is unclear.

The computing hardware and software (the "platform") for each of the United States databases and sources are different. This is one of the principle reasons why data on imports are not linked to data on receipt by facilities, data on expected shipments are not linked to data on actual shipments, and data on one side of the border are not linked to data on the other. Haztraks, for example, is a PC-based system written on

[28] Recall that under RCRA, 40 CFR 264.7 and 40 CFR 265.12,RCRA-permitted facilities must file a report on imports received from foreign sources every two years. Biennial reports are filed either with state hazardous waste management agencies (where states are delegated to run RCRA programs) or EPA regional offices. Often, biennial reports are provided after this deadline and there is no systematic review of these reports.

FoxPro 2.6 for Windows. WITS is a mainframe system written in Visual Basic. Exports also is a mainframe Clipper-compiled system. Annual and biennial reports are not computerized at all.

In Canada, Statistics Canada requires that all imports and exports file a B13 form describing the nature of the goods, value, etc. According to Environment Canada, most forms submitted are missing significant percentages of the information on the forms, and especially those data fields that would be relevant to enforcing import/export restrictions for hazardous waste. Moreover, while Statistics Canada provides B13 forms to Environment Canada, they arrive about a year after shipment and are therefore not useful for enforcement.

It may be important to note the limitations of Customs data. Customs tariff coding, which is developed by the World Customs Organization, does not indicate unambiguously whether a material is a waste or whether it is hazardous. Until and unless these codes are made more explicit for waste, Customs information may be more valuable for intelligence than for tracking.

4.1.2 Compatibility of Tracking Systems Across Borders

Perhaps more central to this project are issues of compatibility of systems between the United States and Mexico and between the United States and Canada. The key question in this regard is whether opportunities exist to improve the compatibility of systems and thereby improve each nation's ability to enforce its own laws and international agreements to which it is a party.

There appear to be two types of compatibility issues between waste tracking systems across borders. First, and the more minor of the two, are sources of incompatibility like differences in waste definitions, language and timing of receipt of information. Translation of Spanish to English and vice versa is inconvenient, but not problematic in the long run.

Somewhat more problematic, but, according to most officials interviewed, still not critical, are differences in waste definitions. Mexican paperwork uses narrative descriptions of wastes, whereas the United States uses RCRA or DOT waste codes and Canada uses CEPA codes, which are directly linked to OECD Red/Amber/Green codes.. Tracking system managers have developed ways to translate back and forth sufficiently well to meet their needs. Perhaps more important, the United States regulates as hazardous waste significantly less than do either Mexico or Canada. Consequently, certain wastes that need to be tracked in Mexico and Canada are not tracked as hazardous in the United States, and from the perspectives of the first two countries, this could be problematic.

Timing of receipt of information across borders also is inconvenient, at least in the United States, but is not expected to be overly problematic in the long run. With regard to PCBs, for example, EPA processes notices of intent to import long before they receive export *guías* from Mexico covering the same shipments. Some enforcement officials in EPA's Region IX claim that Mexican *guías* in general are sometimes not supplied in a timely fashion and can be provided years after shipments actually took place. Since notices are valid for one year, the timing of notification information is less important overall than for manifest information.

One of the most critical issues with respect to compatibility of data systems across borders is the inability to track a single transborder shipment because of the incompatibility of information or the lack of a consistent shipment-based numbering system. The United States, for example, receives no information on actual shipments of Mexican waste to the United States.[29] So when these wastes arrive at the border, accounts of actual shipments begin with the United States waste manifest supplied by the United States importer. Apparently, this same problem exists for United States waste shipped to Mexico. While certain states maintain such systems (New Jersey, for example), the United States has no nationwide system for tracking actual waste shipments to Canada.

[29] Recall that *guías*, which the United States does receive, are permits to ship issued before shipment. Actual receipts at the border frequently are far less than amounts specified on *guías*—on average, about two-thirds of intended shipments listed on *guías* actually arrive at the border (notifications of intent to export from Canada to the United States are, on average, 20 times higher than amounts actually shipped). United States Haztraks users theorize that Mexican generators and shippers request *guías* for far more waste than they eventually ship just in case production increases. The alternative explanation is that some waste approved in *guías* is never shipped back to the United States, but is diverted to far less expensive Mexican treatment facilities, or simply disposed of illegally in Mexico.

Neither Haztraks (nor any other United States tracking system) nor the Canadian CNMTS systems is capable of tracking a single shipment from origin to destination when the origin is in one country and the destination is in another. Sources of this inability emanate from:

- **Differences in definitions of hazardous waste**—fully two-thirds of the hazardous waste shipped from Mexico to the United States is deregulated at the border and is not captured in United States tracking mechanisms. The same is true of lead-acid batteries and waste oils coming to the United States from Canada. Harmonization will help, but harmonization to the lowest common denominator will unlikely be acceptable.
- **Timing of submission of information**—to centralized keepers of waste shipment data. Currently, no tracking systems operate in "real time." Immediate enforcement response to tracking information is, therefore, impossible. In fact, some information arrives and is entered two to three years after shipment has taken place.
- **The lack of a uniform numbering system**—that assigns unique shipment numbers to each shipment regardless of whether it crosses a border. Without such a number, enforcement officials must resort to matching manifests and/or notices, which appears to be problematic. Loss of identity of shipments at transfer/bulking operations further obscures United States, Canadian, and Mexican ability to trace shipments from cradle to grave.
- **Non-compliance with foreign manifest systems—**Canadian generators and shippers report that United States waste management facilities at times refuse to complete the Canadian manifest requirement of issuing a "certificate of destruction." It would appear reasonable to assume that this procedure also is not followed when United States facilities process Mexican waste or when either Canadian or Mexican facilities process United States waste, despite requirements under existing laws.

4.2 Other Limitations of Existing Databases

Waste tracking managers and enforcement officials cited a range of other issues that can be loosely aggregated as limitations of tracking databases. They appear below in no particular order of importance.

4.2.1 Circumvention through Mislabeling.

Haztraks compiles information only for waste shipments and not for shipments of hazardous or toxic substances. This may present an opportunity to circumvent domestic laws or international agreements on hazardous waste shipments by mislabeling waste as raw materials.

4.2.2 Poor Quality or Missing Information.

The quality of information provided and missing data were both cited frequently as hampering both tracking and enforcement efforts. Specific examples include missing manifest information supposedly supplied by United States Customs to EPA, vague language on Mexican *guías*, incomplete and illegible information on Canadian manifest forms, and missing specifications of final treatment facilities on Mexican *guías*.

4.2.3 Difficulties Updating Software

Updating Haztraks software is reported to be problematic, since it is a PC-based utility and multiple users exist in the field. There appears to be no standard procedure for version control or assuring that all users have the latest version of the software with appropriate updates to the user manual.

4.2.4 Confidentiality of Data

In the past, confidentiality was often cited as limitation on the use of Haztraks and CNMTS for enforcement. For example, enforcement officials in several United States states reported that they found it difficult to use Haztraks for enforcement because of the confidentiality of its contents. They reported further that some information regarding the permitting of economic activities (including waste generation and waste management) as well as quantitative information about product or waste flow are considered confidential in Mexico. One specific example was offered where enforcement officials in the United States could not obtain Mexican shipping manifests because they were considered confidential.

INE officials, on the other hand, disagreed that Mexican shipping, manifest or generator information was confidential. They maintain that INE has taken steps to make all these data available for enforcement purposes. In fact, INE officials report that some or all data on waste shipments will be available shortly on the agency's website.

4.2.5 Needs for Additional Information

Existing tracking systems could be significantly strengthened for purposes of enforcement if they managed and made available additional information. Interviewees suggested needs for the following types of information:

- waste generation statistics of generators across borders;
- actual transport manifest data from generators across borders;
- compliance records of generators, transporters and importers, and treatment, storage and disposal facilities;
- information provided by informants on specific shipments or companies;
- prosecution tracking reports and "tricks of the trade" used by the waste management/transport community to circumvent laws;
- requests for information from waste brokers and generators; and
- information held by United States Customs in the Numerically Integrated Profiling System (NIPS) database, which records information on each shipment entering the United States

Of course, issues of confidentiality will become even more difficult to address if either more information is made available or accessibility to existing information is enhanced without proper controls. Also, while some officials recognize the need for information of the types listed above, not all agree that such information needs to be part of tracking databases. Instead, such information may be as or more useful if made available to enforcement officials as intelligence information.

4.3 Relationship between General Tracking Systems and Enforcement

Despite the availability of an increasing array of information on transborder shipments of hazardous waste, there does not appear to be significant use of this information for enforcement purposes. In the United States, for example, Haztraks managers in Region IX suggested that the enforcement office in that region does not use Haztraks at all for enforcement. The general opinion of other interviewees was that notices of intent to import or export in the United States are only useful as one piece of the information puzzle and must be cross-checked with actual manifest information. Even then, information apparently is of limited value in enforcement actions beyond the relatively simple actions taken for non-filing and late filing of appropriate paperwork. Mis-filing (i.e. excess volume, mislabeling of waste types, absence of certain information) is less common.[30] Environment Canada officials commented that many enforcement actions are dropped due to lack of evidence on the contents of shipments. Officials in British Columbia add that their manifest database is used to compile statistics, but not used very much for enforcement. According to Profepa, the environmental enforcement agency of Mexico, Haztraks is not used at all for enforcement.

Tracking systems and the procedures for transfer of information appear to meet the needs of the relevant bilateral agreements *for shippers that want to comply with their obligations under these agreements*. That is, systems exist to assure that pre-notification and consent takes place for those who enter the system and that this information is retained for future use. But tracking systems to accomplish these goals do not necessarily accomplish the broader goals of:

- tracking *all* transborder shipments of hazardous waste;
- ensuring that all waste that should be shipped across borders actually is shipped; and
- ensuring that waste shipped across borders is handled in the most environmentally safe manner.

[30] Officials in EPA Region IV cited several examples of enforcement actions that do, in fact, rely on Haztraks, including identifying manifest discrepancies such as fabricated EPA ID codes for waste management facilities, or missing names of importers, both of which may be important indications of illegal activity.

Weaknesses in existing systems appear to offer opportunities to circumvent domestic laws and international agreements. One graphic example was presented above—that waste shipped from Mexico to the United States or returned to the United States cannot be traced back to the Mexican generator, so there is no way to enforce provisions of Mexican law that require waste generated by United States-owned companies in Mexico (so-called maquiladora plants) to be returned to the United States for management.

Another weakness is that the United States cannot ensure that waste generated in the United States and shipped to Mexico for recycling actually is recycled. The United States receives no information on the ultimate disposition of waste once it crosses the United States-Mexico border.

A third is that waste shipped from Mexico to the United States for treatment, storage or disposal in some states never enters Haztraks, so the database cannot be used for enforcement in these situations. The Mexican system for passing manifests back through the handling chain once a waste shipment reaches its final destination is no guarantee of proper handling, since Mexican officials report that (1) many manifests are, in fact, not returned and (2) even if they are returned, they are supposed to be held by the Mexican generator in the event that Profepa asks to see them during an inspection. There is no systematic review or electronic handling of this information. Under these conditions, potential for U-turn shipments exists.

One general observation of most interviewees in all three countries is that tracking system information is different from intelligence information. Consequently, tracking systems are rarely used to address the issue of illegal shipments of hazardous waste. The Canadian CNMTS database flags suspicious shipments and sends information to Canadian Customs, but this application appears to be the only direct use of tracking information to stop illegal shipments. Border sweeps in all three countries are undertaken independently of tracking efforts and results of sweeps are not entered into tracking databases, since information so obtained often is confidential. According to Canadian officials, border sweeps are effective for only a few hours since communication among transporters is relatively efficient. Intelligence gathering, sampling, and other tools are generally more effective against illegal activities.

Finally, interviewees in all three countries cited the lack of time, financial resources, and appropriate personnel to conduct the necessary analysis of data to support enforcement. Mexican interviewees were particularly vocal regarding the lack of resources for these purposes, and more simply, to implement waste tracking at a more significant scale.

Suggestions to strengthen existing tracking systems in response to limitations as described above are presented in the following chapter.

5 Proposals for Improved Tracking of Transborder Movement of Hazardous Waste

This chapter first summarizes the suggestions of some 50 United States, Mexican and Canadian waste management and other government officials regarding opportunities to improve transborder waste tracking systems for purposes of enforcement of hazardous waste management laws. These suggestions are not necessarily expressions of existing or future policy of any of the three countries. Moreover, not all officials within each country necessarily agree on each issue.

It then presents suggestions of the consulting team, based on background information and information gained through interviews. These latter recommendations represent the opinions of the consultants and not necessarily those of country officials.

5.1 Key Issues Raised by Interviewees

As presented in Chapter 3, interviewees raised a series of concerns over:

- the quantity, quality and timing of data in existing tracking systems;
- the extent to which existing tracking systems are compatible with one another within a country and across borders; and
- whether and how existing tracking systems do, or could be used to, support enforcement of domestic regulations and international agreements regarding transborder shipments of hazardous waste.

Also raised were a series of issues that regard the merits of domestic enforcement programs in general. While important, these concerns are not entirely relevant to the question of tracking systems. Nonetheless, these issues may have value for design of a tracking system at some future point:

- Bi- and tri-national enforcement efforts, such as joint inspections and sampling of contents of shipments would be helpful to enforcement actions.
- More sampling of shipments (using sampling protocols that are admissible in enforcement actions in all three countries) is needed to support enforcement efforts.
- Joint intergovernmental and international training of customs and environmental officials on the detection of discrepancies in paperwork and physical shipments, use of tracking systems, inspection "tricks of the trade," and so on would help increase identification of illegal shipments.
- Intergovernmental enforcement activities at the borders would avoid the inefficiency of coordinating among agencies after the fact.
- Common policies regarding the return of illegal shipments would avoid confusing and unworkable rules that currently result in waste storage at Customs facilities and potential environmental impairment.

5.2 Merits of a Tri-National Hazardous Waste Tracking System

Many of the specific issues raised by interviewees are perhaps best understood within the context of the broader question:

> *Would a single tri-national tracking system improve enforcement of domestic hazardous waste management laws and international agreements regarding transborder shipments of hazardous waste?*

United States Response. Among the North American countries, the United States is perhaps unique in its position as a tracking partner and a geographic neighbor to both Mexico and Canada. This unique position helps explain the differences in opinion about a tri-national waste tracking system between United States officials and either Mexican or Canadian interests. A single system would benefit the United States at both borders, especially if it was modeled after the current United States system or systems.

Consequently, United States respondents generally agreed that a tri-national hazardous waste tracking system would improve the enforcement of hazardous waste management laws. A tri-national system would link international and domestic databases and provide enforcement officials better access to more complete information on waste flows regardless of the border in question.

When pressed, however, nearly all United States officials accepted the notion that there would be little additional benefit associated with a true tri-national system that two bi-national systems—one at each border—could not deliver. Trade conditions, waste flows,and institutional capacities are sufficiently different at each border that separate bi-national systems might be more effective, at least in the short term, than a single tri-national system. Also, there is no evidence that waste originating in either Canada or Mexico transits the United States on its way to the other country. All available data and the opinions of waste management officials in all three countries suggest unambiguously that North American hazardous waste flows across the United States-Mexico border or across the United States-Canada border, but not between Canada and Mexico.

Canadian Response. Canadian officials expressed a somewhat different perspective. According to many Canadian officials, there is no clear evidence (aside from anecdotes) of significant problems with transborder hazardous waste shipments. Nearly all Canadian trade is with the United States and this border seems to be relatively "secure." There is no record of trade in hazardous waste between Canada and Mexico.

Most respondents agreed, nonetheless, that a tri-national tracking system should be a long-term vision. When appropriate, a tri-national system should be a new system, so that all countries can buy into it. A tri-national system would have to track all wastes considered hazardous by any of the three countries.

The emphasis now should be on improving existing systems and improving cooperation between Canada and the United States. Reforms could include:

- joint/cooperative enforcement actions;
- better and more timely sharing of existing information; and
- collecting and sharing more information (e.g., shipments turned back, license plate numbers, individuals' names, proposed border crossing).

Many improvements to Canada's existing tracking systems are already underway. These are the priority. Enhanced electronic transfer of notice information would be useful. Canada recently completed a pilot of EDI notice transmission with the United States

Mexican Response. Mexican enforcement officials do not favor a tri-national system, since it is unlikely that any waste flow between Mexico and Canada will take place. Mexican officials focus their concerns on the United States-Mexico border and advocate strengthening Haztraks. Resources also should be used to purchase computers and other equipment and to finance training of enforcement personnel.

Mexican capacity is currently limited with respect to collection of accurate and timely waste generation and shipment data, management of those data among enforcement and policy making agencies in headquarters and in border state locations, and use of waste flow data in support of enforcement actions. The key issue, therefore, to most Mexican interviewees is building the capacity to perform these functions in a sustainable way.

Specifically, Mexican interviewees suggested a range of activities that will require human and financial resources: (1) installation of Haztraks in Profepa offices (currently, only INE has Haztraks), (2) training of INE and Profepa staff in the use and maintenance of Haztraks (currently, fewer than two dozen INE staff understand Haztraks), (3) updating the Mexican version of Haztraks to include all generators, transporters, recycling centers, treatment facilities, and final disposal sites, (4) updating hardware needed to operate Haztraks, (5) enforcing reporting of actual waste shipments (currently, these data are rarely reported, even though they are required as part of the *guía*/manifest system, (6) providing SCT and SHCP (Mexican Customs) read-only access to Haztraks, (7) provide the United States access to the Mexican version of Haztraks, and (8) providing the capability to file Haztraks information electronically.

5.3 Harmonize Differences in Definitions of Hazardous Waste

Issue: *Tracking systems in each of the three North American countries rely on their own, somewhat different, domestic legal definitions of hazardous waste. This results in some waste flows that exit tracking systems when they cross borders, thereby escaping the exporting country's ability to track waste flow from "cradle to grave."*

Suggestions of Interviewees

1. Establish common procedures and manage waste flow data to track all wastes classified as hazardous by any one of the three North American countries.
2. Establish common procedures and manage waste flow data to track waste according to a "harmonized" system appropriate to the definitions of hazardous waste in all three countries. One option is the OECD red-amber-green waste classification system.
3. Establish common procedures and manage waste flow data to track only those wastes classified as hazardous by both (or all three) countries.

Discussion

While all three recommendations were suggested during the course of this project, significantly more interest was expressed for the first and second options. The first option is attractive from the perspective that a single system (or two bi-national systems) so configured would enable all three countries to use waste flow data as they see fit under their own laws and enforcement priorities. On the other hand, it could require the management of significantly more data than the other two options.

A single "harmonized" waste classification scheme is attractive since it would simplify information handling. Yet serious concerns were expressed that waste classification could be "harmonized down," or reduced to the least common denominator across all three countries. This is the essence of the third option, which appears to have serious limitations.

Consultants' Observations

The United States, Canada and Mexico should consider using the OECD waste classification scheme and their own waste classification schemes for purposes of tracking waste flows in North America. Regulatory action might be needed to change certain forms to allow for the use of multiple waste classification codes. Each country would have to provide a translation of their domestic waste classification scheme to the OECD scheme. Each country would be free to formulate enforcement and other uses of tracking data on the basis of either or both domestic and OECD waste classifications. No data would be lost across borders and each country could respond to the information needs of the others regardless of whether the waste in question was considered hazardous under domestic definitions.

This would appear to be the only way to preserve the value of waste type information for purposes of enforcement of domestic hazardous waste management laws and retain an ability to communicate about all waste flows across borders.

Such a scheme also would harmonize waste tracking systems in North America with those of most of Europe and many other industrialized nations.

5.4 Improve Completeness, Accuracy, and Timing of Tracking Data

Issue: *Waste manifests sometimes are incomplete, inaccurate and untimely. This frustrates the enforcement officials' ability to track waste shipments from "cradle to grave" and can result in the circumvention of both domestic waste management laws and international agreements regarding the transborder movement of hazardous waste.*

Suggestions of Interviewees

1. Institute a real-time waste tracking system.
2. Institute new technologies to reduce data entry errors and reduce the time needed to maintain waste tracking systems.
3. Encourage United States waste management facilities to complete certificates of destruction (Canada) and return waste manifests to Mexican transporters as a condition of payment for their services.

Discussion

It does not appear that a real-time waste tracking system is feasible or advisable at this time. Significant barriers (such as resource availability and acceptance of electronic signatures) exist that would frustrate such an effort. Certain types of technology could help reach a goal of real-time tracking. Package and document

shipping companies use these technologies currently and have demonstrated their effectiveness. Canada is currently evaluating pilot projects for electronic submission of tracking documentation. Options include electronic manifests, bar-codes, and specialized hardware to read and enter data, query status of shipments, and update files on individual shippers or customers.

Electronic filing and scanning of documents also can reduce compliance costs for the regulated community and reduce paperwork burdens on government entities.

United States facilities are supposed to furnish Canadian generators and haulers certificates of destruction when they dispose of Canadian waste. Canadian exporters, in turn, are supposed to furnish this information to Environment Canada. The level of compliance with returning these certificates, however, is not as high as required. According to Canadian generators and haulers, this is because United States facilities have no incentives under United States law to fill out these forms. It does not seem prudent to link completion of these forms to payment, however, since that would link a foreign government requirement to a United States commercial transaction.

Harmonizing regulatory requirements for tracking of imports and exports across all three North American countries might be a more effective way to ensure cross-border compliance with foreign requirements.

Consultants' Observations

In addition to regulatory harmonization, the United States, Canada and Mexico could consider imposing a series of fees and penalties on waste shipments to help ensure that information is complete and accurate. Of course, any such system would have to be customized to account for existing cost-recovery charges and legal authorities.

Since all three countries already have systems that require pre-notification of intent to ship as a condition of shipping hazardous waste across borders, a performance bond could be required at the time of pre-notification. If the notification was incomplete, a portion of the bond to cover processing costs would be forfeited and a re-notification would be required.

If complete, the pre-notification/consent process would continue. If, at any stage in transit, manifest information was found to be incomplete or inaccurate, the bond would be forfeited and the waste would have to be returned to its sender. Bond amounts would have to be sufficient to cover the costs of repatriation in the event that government agencies seized waste shipments and took responsibility for their return. Enforcement actions for incomplete and inaccurate information, which are already authorized in all three countries, could then be initiated.

When a completed manifest is returned from the ultimate waste treatment or disposal facility, a portion of the bond would be credited to the original shipper. If after some reasonable period, say 90–120 days, a final manifest is not received, the original bond would be forfeited in its entirety. Enforcement actions, which are currently authorized in all three countries, would then be taken for violation of manifest procedures.

Even if all information was complete, accurate and timely, a portion of each pre-shipment performance bond would be retained to cover the costs of processing waste tracking information. These revenues would have to be sufficient to finance all on-going costs of waste tracking, including hardware, software, training, and personnel needs.

This performance bond system would require regulatory, and perhaps statutory, changes in all three countries. One disadvantage of this recommendation is that waste shippers will have incentives to circumvent the regulatory system to the extent that costs of entering the system increase.

5.5 Add Certain Key Information To Tracking Systems

Issue: *Some critical information, such as company enforcement and compliance history, is not available or linked to existing databases that track pre-notifications and consents and/or actual waste shipments (manifests). Such information can be particularly useful to help identify potential violators or otherwise support real-time enforcement efforts. Some of this information could be added to tracking systems, while other information may be more useful in a stand-alone form to support intelligence gathering and targeting initiatives.*

Recommendations of Interviewees

1. In the United States, make the United States Integrated Data Enforcement Analysis (IDEA) database more widely available to EPA regions.
2. Add this sort of information to hazardous waste tracking databases directly or link this information to such databases through ID codes of specific waste generators, shippers, and treatment, storage and disposal facilities.
3. Add other types of data, such as public complaints about specific generators, shippers or management facilities and information about detained shipments of hazardous waste, as "modules" to existing hazardous waste tracking databases.

Discussion

IDEA integrates EPA's air, water and waste compliance databases by facility and adds financial and economic information from Dun and Bradstreet, the Securities and Exchange Commission, and the Bureau of the Census. These sources provide enforcement officials with valuable information for purposes of identifying potential violators, building an enforcement case for a known violator, and setting appropriate penalties.

Similar, but more limited, information is available to Environment Canada through its CNMTS database. Environment Canada also maintains an enforcement activities database. These data generally are not available electronically in Mexico.

Consultants' Observations

It appears to be an excellent suggestion to link the current tracking systems to other sources of relevant information regarding the environmental and economic performance of firms that participate in transborder shipping of hazardous waste. One potentially valuable addition is tracking of enforcement actions on a firm basis. Confidentiality could be ensured by limiting access to these data hierarchically.

It may be important to distinguish between information needed to track shipments *per se* and other information that may be of value for planning and targeting enforcement efforts. The former should be directly added or linked explicitly to existing tracking systems. It may be more helpful in the case of information that falls into the latter category to simply make it available to enforcement officials in other forms.

One concern is that data added to tracking systems or other forms of supplementary "intelligence" data not overwhelm agencies' ability to process these data effectively. In the case of complaints, for example, some screening process should be applied to help identify information about unusual circumstances.

5.6 Increase the Effectiveness of Existing Enforcement Efforts By Linking In-Country Databases

Issue: *Interviewees in all three countries suggested that enforcement efforts could be strengthened simply by linking or sharing more readily available sources of information within their own countries.*

Suggestions of Interviewees

1. Link United States waste tracking databases to media compliance databases through EPA identification codes for individual generators and TSD facilities.
2. Share databases on imports and exports of waste with enforcement agencies.
3. Make available, in read-only format, Mexican Haztraks information to other agencies involved in the regulation of hazardous waste transportation, imports and exports, such as SCT, Secofi, and SHCP (Customs).
4. Improve sharing of information among Environment Canada, Canadian Customs, and Statistics Canada (B13 forms).

Discussion

Sharing existing data among agencies of the same country would appear to be the most productive short-term action that a country can take to enhance its own enforcement efforts. Also, sharing of domestic information sources does not require a more complicated international forum for negotiation.

This does not mean, however, that domestic information sharing will be straightforward. Currently, there are security, business confidentiality, and "turf" rationales for not sharing that must be overcome. Moreover, it may be important to note the limitations of Customs data. Customs tariff coding, which is developed by the World Customs Organization, does not indicate unambiguously whether a material is a waste or whether it is hazardous. Until and unless these codes are made more explicit for waste, Customs information may be more valuable for intelligence than for tracking.

In addition, to the extent that domestic databases expand the types of data they handle, problems of sharing information across borders may become more complicated.

Consultants' Observations

All three countries should seek to link as much information as possible from other sources to existing hazardous waste tracking databases. Other sources of data should be linked, however, and not incorporated to avoid further complications should domestic tracking information be shared more openly with trading partners in the future.

Specifically, it makes little sense in the United States to maintain essentially three unlinked tracking systems—Haztraks, WITS and Exports. State systems or the United States Customs tracking system may be helpful to better understand United States exports to Canada (currently, only EPA's Exports database can do this). The use of Customs data may require Customs to flag or otherwise segregate shipments of waste.

In Mexico, the most obvious potential improvement of this nature is sharing of Haztraks information between INE and Profepa. Beyond that initiative, Mexico should consider the merits of sharing Haztraks information with SCT and SHCP. Emerging state systems, especially that developed in Baja California, may provide helpful information.

In Canada, sharing of Customs information could be particularly helpful for enforcement, but only if that information is shared electronically. Read-only access to scanned shipping documents would enable Environment Canada to respond within hours or days to potential violations. Currently, Customs mails documents to Environment Canada, where information is entered into CNMTS. By the time Customs information is in the database, violators are usually no longer traceable.

5.7 Institute True Origin to Destination Tracking By Linking Existing Databases

Issue: *Neither Haztraks (nor any other United States tracking system) nor the Canadian CNMTS systems adequately tracks a single shipment from origin to destination when the origin is in one country and the destination is in another. Compliance with existing requirements is the major impediment. Other sources of this inability emanate from differences in definitions of hazardous waste, timing of submission of information, non-completion of required paperwork, and the lack of a uniform numbering system for shipments that prevents the linking of data across tracking systems.*

Suggestions of Interviewees

1. Use a standard system of numbering for all transborder waste shipments.
2. Use a standardized, perhaps tri-lingual, waste manifest form for all transborder shipments of hazardous waste.

Discussion

A standardized numbering system for transborder waste shipments would greatly simplify "cradle to grave" tracking and linking of existing tracking systems. Such a system for all waste shipments would enable tracking of "bulked" shipments from storage facilities that were bound for foreign facilities. Without such a number, enforcement officials must resort to matching manifest and/or notices, which appears to be problematic. Loss of identity of shipments at transfer/bulking operations further obscures United States, Canadian, and Mexican ability to trace shipments from cradle to grave.

The use of a standardized waste manifest system implies that information also would be shared among North American enforcement officials. Currently, actual waste shipment information from Mexico is not provided to the United States because of Mexican concern for confidentiality of waste generation information. Until this issue is addressed, a standard waste manifest form, however likely, would be of little value for enforcement.

Consultants' Observations

A standardized numbering system for transborder waste shipments would be a great improvement over the current system, which has no sequential numbering at all. Standardized numbering systems are commonplace in the package delivery business, so it stands to reason that there is no practical constraint on imposing such a system on waste shipments. The United States, Canada and Mexico should consider consulting with a sample of package delivery services to better understand their use of numbering systems.

One unique situation with regard to waste shipments, however, is bulking and transshipment. Where waste shipments are combined at a storage/bulking facility, new shipping numbers of the bulked shipment would have to be linked to all originating numbers of the individual shipments comprising the bulked shipment. This implies that standardized numbering would have to be used for domestic and international shipments.

A standardized shipment numbering system would be the first step toward linking the four key hazardous waste tracking systems in place in North America: CNMTS, Haztraks, Exports, and WITS. Linking existing databases, in turn, could be the initial step toward developing a tri-national tracking system or two bi-national systems. The ability to link information in these databases by shipment number would greatly facilitate systematic searches of information, increase the number and quality of checks that each country could undertake, and facilitate computerized flagging of abnormalities and inconsistencies.

Of course, these benefits presume that officials across borders would, in fact, share information in their databases. Confidentiality of information could be an issue. Individual data fields could be blocked from view by the country that enters confidential data.

Ability to alter information could be another issue. Read-only access across borders would help address this concern.

5.8 Increase Resources for Tracking Transborder Waste Shipments

Issue: *Interviewees from all three countries cited a serious need for better hardware, software, and training of individuals in the use of data on waste movements. Perhaps the most serious need exists in Mexico. Without investments in these areas, enforcement efforts will continue to be compromised and existing systems will present little incentive for compliance.*

Suggestions of Interviewees

1. Increase training of officials in the use of tracking systems.
2. Devote more time to the evaluation of tracking data and diagnostics using these data.
3. Increase funding of enforcement efforts to incorporate the better use of tracking information and intelligence gathering.

Discussion

Mexican interviewees consistently cited the lack of trained personnel as a significant problem, perhaps more problematic than the limitations of a waste tracking system itself. That is, they give the impression that as much or more would be gained by investing in people and training than in the collection and distribution of more information on waste flows. While the other two nations consider human resources an important issue, neither Canadian nor United States interviewees characterized human resources as important a limiting factor as the contents and availability of waste tracking information.

Mexican officials offered similar comments on the lack of computer hardware and funds needed to scale-up waste tracking and enforcement provisions of the LGEEPA that govern waste imports and exports.

With regard to inspections, United States and Canadian officials noted that the lack of personnel restricted inspections to a few specific areas (i.e., cargo shipped in trucks) and that this resulted in diminished compliance in other areas (i.e., cargo shipped by sea or overland by train). United States officials also commented repeatedly on the lack of time to conduct the needed analyses of existing tracking information.

Consultants' Observations

Inevitably, the limits imposed on available resources constrain government initiatives. One way to address this concern is to improve the efficiency of the initiative in question. This would appear feasible, at least

within the United States, since multiple waste tracking systems are in use and could be consolidated. Without careful study, a firm conclusion would be speculative, but it stands to reason that, on the basis of economies of scale alone, a single consolidated United States waste tracking system would be less expensive to maintain than three or four smaller systems.

By extension, it also stands to reason that a single North American system would be less expensive than separate systems in all three countries. Consequently, consolidation of existing systems should be explored for the economies they can yield.

Of course, economies do not necessarily translate into additional resources, especially where governments are facing budget deficits. New sources of funds based on the payment of fees for services, such as the one identified above, also should be explored.

Appendix A: Interview Guide

Background

Apogee Research, Inc. and Advanced Sciences, Inc. are preparing a needs assessment to document and evaluate current capacity to track and enforce tri-national hazardous waste activities in North America. This project is being conducted for the Commission for Environmental Cooperation (CEC) with representatives from environmental agencies within Canada, the Unites States and Mexico. The CEC is an international organization created pursuant to the North American Agreement on Environmental Cooperation to address regional environmental concerns, help avoid potential trade and environmental conflicts, and promote the effective enforcement of environmental laws in Mexico, the United States and Canada. This interview guide has been prepared to assist in developing a profile of the opportunities, constraints and options to improve tracking of tri-national hazardous waste movements in support of enforcement.

Hazardous waste program administrators, environmental officials, and relevant experts will be asked to respond to the questions below in an executive interview which may be conducted in person or by telephone. Results are expected to be confidential, and findings will be summarized and documented in an internal report to the CEC.

Major Interview Topics

1. What information about trans-national hazardous waste tracking do you need to enforce domestic and international waste management laws?
2. What systems are currently in place to provide some or all of this data?
3. What improvements are necessary to better manage and enforce trans-national hazardous waste laws?
4. Would a tri-national hazardous waste tracking system provide improvements in tracking leading to better enforcement of hazardous waste management laws?

Topic #1 What information about trans-national hazardous waste tracking do you need to enforce domestic and international waste management laws?

- Please identify the specific information on hazardous waste tracking that is most important to gather, analyze and exchange for effective enforcement of hazardous waste management laws.
- Is the reporting of this information not currently required by law? If so, which information?
- Is there information in the control of other government agencies, and not already included in your country's tracking system, which would be important to integrate into a trans-national tracking system?
- What is your definition of hazardous waste?
- Is hazardous waste flow information required on a company level, by waste type, or both?
- Are there limits on confidentiality of data and system security procedures that affect enforcement?
- Do you currently track enforcement actions and/or compliance efforts either as a part of or separately from your hazardous waste tracking system?
- Is all of the information you require to target potential violators or take an enforcement action readily available either in your tracking system or elsewhere?

- Are the current tracking systems responsive to the various needs for information, including enforcement, targeting, reporting, management, quality control?
- Have you ever been prevented from taking an enforcement action because of the lack of hazardous waste tracking information?
- From an enforcement perspective, is the current hazardous waste tracking information you receive of sufficient quality and reliability to effectively enforce hazardous waste management laws?
- What information about the following actors in transborder shipments of hazardous waste would be valuable to assist enforcement efforts:
  - Generators?
  - Transporters/shippers?
  - Transfer and storage facilities?
  - Brokers (third-parties who arrange or facilitate shipments)?
  - Hazardous waste treatment, storage and disposal facilities?

Topic #2 What systems are currently in place to provide some or all of this data?

- What legal authorities mandate the use of your hazardous waste tracking system?
- Please describe the current [Canadian/United States/Mexican] system for notifying North American trading partners of the expected movement of hazardous waste across national borders.
- What information about the following actors in transborder shipments of hazardous waste does your current system capture:
  - Generators?
  - Transporters/shippers?
  - Transfer and storage facilities?
  - Brokers (third-parties who arrange or facilitate shipments)?
  - Hazardous waste treatment, storage and disposal facilities?
- Are any parts of this system computerized? If so, what software is used?
- Is the information provided timely and complete?
- What information is not currently provided in these systems that would assist in enforcement of hazardous waste laws?
- Are there different tracking systems currently in place for tracking import and export movements? Are they linked?
- Are there different tracking systems currently in place for tracking hazardous waste movement within country borders? If so, are the domestic and transborder systems linked?
- Do conventions exist elsewhere (i.e. the European Union nations) that would provide valuable lessons for North America trading partners in hazardous waste tracking systems? (Conventions refer to practices, procedures, systems, etc.)
- Can you recommend any government studies, conferences, private reports, or individuals that have already evaluated the effectiveness of hazardous waste tracking systems, especially as related to enforcement of hazardous waste management programs?

Topic #3 What improvements are necessary to better manage and enforce trans-national hazardous waste laws?

- To what extent do differences in hazardous waste definitions create opportunities for individuals to circumvent the law?
- Are you aware of certain data on trans-national movement of hazardous wastes to which you have no or limited access? If so, how could access to these data be improved?
- Is the efficiency of data exchange between countries acceptable for enforcement purposes? If not, what improvements could be made?
- What improvements, if any, could be made to the current system in the area of information retrieval and management?
- Would company-specific information (e.g., on generators, transporters/shippers, transfer and storage facilities, brokers, or treatment, storage and disposal facilities) improve your ability to ensure compliance with trans-national hazardous waste laws?
- Other than information regarding shipments specifically claimed to be hazardous waste, is there other information which would assist in your ability to target or identify violators of transborder hazardous waste shipment or other trans-national environmental requirements? If so, what kind of information would be helpful, and is that information currently available?
- What other information or system improvements would lead to better enforcement of trans-national hazardous waste laws?

Topic #4 Would a tri-national hazardous waste tracking system provide improvements in tracking, leading to better enforcement of hazardous waste management laws?

- How could a single tri-national hazardous waste tracking system improve enforcement of hazardous waste management laws?
- What do you see as the major impediments to the development of a tri-national hazardous waste tracking system?
- Would a single tri-national hazardous waste tracking system improve efficiency of the exchange of information on hazardous waste movements in North America?
- What management issues would be most important in the development and operation of a tri-national tracking system?
- To promote better enforcement of hazardous waste management laws, should all or part of the three countries' existing systems be linked into the tri-national system? If parts, which ones?
- What capabilities should a tri-national hazardous waste system have in order to effectively analyze and identify possible violations?
- What modules of an effective tri-national system would need to be entirely created? What would the sources of data be?
- How could enforcement data and analyses in a tri-national system be protected from unauthorized public release and controlled access to many users?
- What linkages to other enforcement databases (e.g. Interpol) would be useful?

- Should a tri-national system include a method to obtain tips from the public concerning illegal hazardous waste activities? If yes, who would be responsible for investigating the tip and entering the data?
- In your opinion, would a tri-national hazardous waste tracking system improve enforcement of hazardous waste management laws?

Appendix B: Interviews Conducted

	United States - Interviews	
Contact Person	**Organization**	**Title**
Roy Akridge	United States Customs, San Diego, California	United States Customs HazMat Coordinator/ Inspector
Joel Barrion (for Richard Walker)	United States Customs, Texas	United States Customs HazMat Coordinator/ Inspector
Anita Bogden	Northeast Environmental Enforcement Project	Director
Carolyn Carr (w/ Bob Heiss)	United States Environmental Protection Agency—HQ	Import-Export Coordinator
Mr. Kit Davis	California Department of Toxic Substances Control	
Mike Foster	Arizona Department of Environmental Quality	
Heidi Hall	United States EPA, Region IX	United States/Mexico Border Hazardous Waste Coordinator
Robert Heiss	United States EPA, OECA, Office of Compliance	
David Kirk	PRC-Canada	Consultant
Pamela LePen (for Roger Vince)	California EPA, Department of Toxic Substances Control	Border Coordinator
Marc Mowry	United States EPA Region IX, Data Management and Analysis Section	
Steve Niemeyer	Texas Natural Resources Conservation Commission	Border Coordinator
Michael Penders	United States EPA, OECA, Office of Criminal Enforcement	
Rocky Piaggione	New York State Attorney Generals Office	
Ferdinand Scaccetti	N.J. Department of Environmental Protection, Manifest Section	Supervising Environmental Specialist
Greg Schulte	United States Customs, San Diego, California	Customs Criminal Investigator
Joe Schultes	United States EPA, Region VI	Import-Export Coordinator
Ann Stephanios	United States EPA, OECA, Office of Regulatory Enforcement	RCRA Enforcement Staff

Canada – Interviews

Contact Person	Organization	Title
Robert Huang	Alberta Environmental Protection, Industrial Water And Wastewater Branch	Senior Engineer
Kevin Hinke	British Columbia Ministry of the Environment, Lands and Parks	Former Head, Special Waste
Rob Dalrymple	British Columbia Ministry of the Environment, Lands and Parks	Current Head, Special Waste
George Rocoski	Ontario Ministry of the Environment and Energy, Industrial Hazardous Waste Section, Waste Reduction Branch	Manager
Don Earl	Ontario Ministry of the Environment and Energy, Investigations and Enforcement Branch	Waste Management Enforcement Officer
Doug Waldie	Revenue Canada, Export, Inspection and Control Division, Customs Border Service Branch	Chief
Roberta Goulet	Revenue Canada, Inspection and Control Division, Customs Border Service Branch	Senior Program Officer
Flavio Pollarolo	Revenue Canada, Reporting, Release and Examination Division, Commercial Services Directorate	Senior Program Officer
Caroline Vecchio	Revenue Canada, Intelligence Services Division, Enforcement Directorate	Senior Intelligence Officer
John Myslicki	Environment Canada, Hazardous Waste Management Division	Chief
Suzanne Leppinen	Environment Canada, Hazardous Waste Management Division	
Charles Cormier	Hazardous Waste Management Division	
Guy Martin	Environment Canada, Office of Enforcement	
Nancy Porter-Cathcart	Transport Canada, Regulatory Affairs, Transport of Dangerous Goods	
Robbie Tomason	Transport Canada, Transport of Dangerous Goods, Compliance and Operations	Director

Mexico - Interviews		
Contact Person	**Organization**	**Title**
Biol. Antonio Ibarra Cerecer	Profepa/Baja California	Subdelegado de Verificación Industrial
Quim. Ma. del Pilar Leal Hernández	Profepa/Chihuahua	Subdelegado de Verificación Industrial
Ing. Francisco Maytorena Fontes	Profepa/Sonora	Subdelegado de Verificación Industrial
Biol. Jaime Eduardo Garcia Sepúlveda	Procuraduría Federal de Protección al Ambiente (Profepa)	Director de Clasificación de Zonas de Riesgo Ambiental
Ing. Juan Carlos Camargo	Semarnap/INE (Instituto Nacional de Ecología)	Coordinador de la Unidad de Sistemas
Hugh Harleston López Espino	Semarnap/INE	Coordinador de la Unidad de Sistemas e Informática
Ing. Sergio Rivapalacio Chiang	Semarnap/INE	Director de Residuos Peligrosos y Riesgo
Lic. Oscar Ramírez	Semarnap/INE	Coordinador de Control y Sistemas de Información
Ing. Antonio Cedillo	Semarnap/INE	
Ing. Luis Wolf	Semarnap/INE	Dir. de Asuntos Fronterizos y Promoción Industrial
Ing. Miguel Muñoz	Semarnap/INE	Sub dir. de Movimientos Transfronterizos
Lic. Ernesto Gándara	Semarnap/Sonora	Delegado de la Semarnap en Sonora
Lic. Rodolfo Agustín Ramos	Semarnap/Coahuila	Delegado de Semarnap en Coahuila
Ing. Jesús López Olvera	Semarnap/INE	Subdir. de materiales peligrosos y de la Cicoplafest
Carlos Silva	Semarnap/Profepa	Dir. de Asistencia Industrial
Lic. Felipe Riancho	SCT	
Lic. Valentín Neri	SCT	Dir. de Transporte Terrestre de Materiales y Residuos Peligrosos

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