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Report to Congressional Requesters

June 2006

CLEAN WATER

Better Information and Targeted Prevention Efforts Could Enhance Spill Management in the St. Clair–Detroit River Corridor

GAO-06-639

June 2006

GAO Accountability·Integrity·Reliability

Highlights

Highlights of GAO-06-639, a report to congressional requesters

CLEAN WATER

Better Information and Targeted Prevention Efforts Could Enhance Spill Management in the St. Clair–Detroit River Corridor

Why GAO Did This Study

Spills of oil and hazardous substances in the St. Clair–Detroit River corridor have degraded this border area between the United States and Canada and are a potential threat to local drinking water supplies. Within the United States such spills are reported to the National Response Center (NRC), and in Canada to the Ontario Spills Action Centre. This report discusses (1) how many oil and hazardous substance spills greater than 50 gallons (or of an unknown volume) were reported in the corridor from 1994 to 2004, and how accurately reported spills reflect the extent of actual spills; (2) what processes are used to notify parties of spills, and if they contain explicit requirements for reporting times and spill magnitude; and (3) the extent of Environmental Protection Agency (EPA) and the Coast Guard's spill prevention efforts and enforcement activities in the corridor from 1994 to 2004.

What GAO Recommends

GAO recommends that EPA Region 5 and the Coast Guard's District 9 update spill information and determine whether existing spill notification processes can be improved. GAO also recommends that EPA consider gathering information on which facilities are regulated under its spill prevention program and develop goals for its spill prevention inspections. The Department of Homeland Security agreed with our findings and conclusions overall and EPA provided technical comments only.

www.gao.gov/cgi-bin/getrpt?GAO-06-639.

To view the full product, including the scope and methodology, click on the link above. For more information, contact John B. Stephenson at (202) 512-3841 or stephensonj@gao.gov.

What GAO Found

The NRC received 991 spill reports and the Ontario Spills Action Centre received 157 reports of spills in the corridor from 1994 through 2004, but these reports do not accurately portray the actual number or volume of spills. Many spills go unreported by responsible parties because they do not understand or fail to comply with reporting requirements. Further, multiple reports for the same spill are often recorded by NRC and provided to EPA and the Coast Guard for investigation. EPA does not remove all duplicate spill reports or update its data after investigating spills. Coast Guard officials update their spill data after investigations but they are unable to update spill volume estimates due to automated system limitations. GAO also found that, according to agency data sets, other events—combined sewer overflows (CSOs) and industrial permit violations—occurred more frequently than spills in the corridor. While data on industrial permit violations and CSOs might be subject to the same limitations as the spill data because the data are self reported and facilities may not report all of these events, spills may be particularly subject to underreporting because they are not part of a structured program as CSOs and industrial permit violations are.

There are multiple parties involved in spill notification in the corridor and agreements outlining U.S.–Canadian notification processes are not explicit about reporting times or the magnitude of spills that warrant notification. The coast guards of each country have agreed to notify one another of spills primarily when a joint response may be needed. Another agreement between Michigan and Ontario officials calls for notifying each other of spills that may have a joint impact. We reviewed six selected spill incidents that illustrate the various ways that notification can occur. The drinking water facility operators we contacted on the U.S. side of the corridor had differing perspectives on current notification processes, and the majority expressed concern that their facilities could be contaminated by spills if they are not notified in a timely manner. Finally, efforts have been made to develop informal notification processes between individual industries or trade associations and drinking water facilities.

EPA's spill prevention program is limited and the Coast Guard addresses spill prevention as part of other compliance efforts. EPA's prevention program addresses only oil spills. Further, EPA is uncertain of which specific facilities are subject to regulation under its spill prevention program, and conducts varying numbers of inspections per year. EPA inspections uncovered significant spill prevention deficiencies, whereas the Coast Guard's inspections revealed minor issues. The agencies issued a total of 16 penalties for spills and program noncompliance during the period we reviewed.

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Abbreviations

BMP	best management practices
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CSO	combined sewer overflows
DEQ	Department of Environmental Quality
EPA	Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-to-Know Act
NPDES	National Pollution Discharge Elimination System
NRC	National Response Center
Oil Fund	Oil Spill Liability Trust Fund
OSC	on-scene coordinators
PEAS	Pollution Emergency Alerting System
PECC	Pollution Emergency Communications Coordinator
RP	responsible party
SAC	Ontario Ministry of Environment's Spills Action Centre
SLEA	Sarnia-Lambton Environmental Association
SPCC	Spill Prevention, Control, and Countermeasure

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Congressional Requesters

Recent spills of large quantities of oil and hazardous substances like vinyl chloride have raised public concerns about the safety of drinking water for the more than 5 million people living within the St. Clair–Detroit River corridor, which borders the United States and Canada. The 98-mile corridor formed by the St. Clair River, Lake St. Clair, and the Detroit River serves as a major shipping channel between the upper and lower Great Lakes. Approximately 500 industrial facilities, including chemical companies, oil refineries, power plants, and steel mills, are located within the corridor. The heaviest concentration of industry on the U.S. side is in the southern part of the corridor, around Detroit; Canadian industry is concentrated on the northern part of the St. Clair River, around Sarnia, Ontario. Seventeen drinking water facilities on the U.S. side have intakes in the corridor close to these industrial centers. The corridor is part of the Great Lakes Basin, whose waters, under the Great Lakes Water Quality Agreement, the two countries recognized could not be restored and enhanced without cooperation between the two countries. Yet because of contamination from spills and other pollutant discharges, the St. Clair and Detroit Rivers have fish consumption restrictions, and oil sheens and other debris are commonly found on the waters' surface or along shorelines.

Figure 1: Spill Materials in the St. Clair–Detroit River Corridor

Source: U.S. Coast Guard.

To ensure that spills[1] are promptly reported, several statutes—including the Clean Water Act[2] and the Comprehensive Environmental Response, Compensation, and Liability Act (Superfund)[3]—require that the party responsible for a discharge of oil or hazardous substance notify the National Response Center (NRC) immediately. For oil spills, any amount that would create a sheen on the water is a reportable quantity whereas, for hazardous substances, Environmental Protection Agency (EPA) regulations (prescribed under Superfund and the Clean Water Act) specify what amounts the substances must exceed to be reportable. The NRC is the national point of contact for spill reporting, and it distributes reported spill information to agencies, including EPA and the Coast Guard, which are tasked with spill response for inland and coastal spills, respectively. In the corridor, EPA's Region 5 and the Coast Guard's District 9 are

[1]For purposes of this report, "spill" refers to an unanticipated or accidental discharge of pollutants into the waters of the corridor, but excludes National Pollutant Discharge Elimination System (NPDES) permit violations and combined sewer overflows. However, we treat permit violations and combined sewer overflows reported to the NRC as spills within this report.

[2]Federal Water Pollution Control Act ("Clean Water Act"), 33 U.S.C. §§ 1251-1387.

[3]Comprehensive Environmental Response, Compensation, and Liability Act ("Superfund"), 42 U.S.C. §§ 9601-9675.

responsible for responding to reported spills. While the NRC is a major source of spill information for the agencies, EPA and the Coast Guard may be contacted directly about a spill or learn of it while conducting their regular duties. EPA and the Coast Guard's spill-related responsibilities are outlined in the National Contingency Plan, the federal government's guide to oil and hazardous substance spill response. It describes how the agencies are to assess a spill, and initiate response action if necessary. In addition to federal agencies, the Michigan Department of Environmental Quality (Michigan DEQ) and Michigan State Police have a role in spill-related response and notification. In Canada, the Ontario Ministry of Environment has a prominent role in spill-related activities in the St. Clair–Detroit River corridor, including notification and enforcement. The Ontario Ministry of Environment's Spills Action Centre (Ontario SAC) obtains and reports spill information to responders and other stakeholders. Environment Canada, the federal-level regulatory agency, has a lesser role in spill-related activities in the corridor.

To decrease the likelihood of spills, both EPA and the Coast Guard administer spill prevention programs. EPA's program requires that non-transportation related facilities (e.g., power plants) with a specified storage capacity prepare spill prevention plans and meet certain operational standards. These facilities must also provide containment structures or explain in their plans why the structures are not feasible. The Coast Guard's prevention program requires vessels with the capacity to carry certain amounts of oil and hazardous substances—and certain facilities that transfer oil and hazardous substances—to have written transfer procedures or operations manuals, meet minimum equipment requirements, and follow prescribed procedures when transferring oil on navigable waterways. EPA and the Coast Guard have the authority to fine parties that are responsible for spills, or that do not comply with spill prevention program requirements.

In this context, you asked us to examine (1) how many oil and hazardous substance spills of more than 50 gallons (or of an unknown volume) were reported in the St. Clair–Detroit River corridor from 1994 to 2004, and how accurately reported spills reflect the extent of actual spills; (2) what processes are used to notify parties of spills, and whether they contain explicit requirements for reporting times and spill magnitude; and (3) the extent of EPA and the Coast Guard's spill prevention efforts and enforcement activities in the St. Clair–Detroit River corridor from 1994 to 2004.

To obtain overall information relating to spills, we gathered information from officials within various offices in EPA; the Coast Guard; the state of Michigan; and Ontario, Canada. To determine the number of spills over 50 gallons (or of an unknown volume) reported in the St. Clair River, Lake St. Clair, and the Detroit River and its tributary, the Rouge River, between 1994 and 2004 we obtained spill data maintained by NRC, EPA, the Coast Guard, Michigan DEQ, and the Ontario SAC. We also obtained EPA and Michigan DEQ data sets related to other pollutant discharges, such as combined sewer overflows (CSO) and National Pollution Discharge Elimination System (NPDES) industrial permit violations to obtain more complete information on pollutants discharged into the water bodies of the St. Clair–Detroit River corridor. To assess what processes are used to notify parties of spills and whether they contain explicit requirements for reporting times and spill magnitudes, we reviewed applicable laws and spill notification agreements and obtained information on implementation of these agreements. We obtained and analyzed documentation on six spills to better understand how the notification process was conducted under varying circumstances, and to show a range of spill materials and source locations. We also obtained information from all 17 of the drinking water facility operators on the U.S. side of the corridor to obtain their perspectives on the timeliness of spill notification. To identify spill prevention efforts and enforcement activities, we obtained and analyzed the relevant legislation, agency spill prevention and enforcement policies, as well as agency data on spill-related inspections and enforcement actions in the corridor since 1994. We performed our work between September 2005 and June 2006 in accordance with generally accepted government auditing standards. A more detailed description of our methodology is provided in appendix I.

Results in Brief

The NRC received 991 spill reports from the U.S. side of the corridor and the Ontario SAC received an additional 157 spill reports from the Canadian side of the corridor from 1994 to 2004, but these reports do not accurately capture the actual number or volume of spills. U.S. and Canadian officials believe that many spills go unreported because, among other reasons, responsible parties may not understand or comply with the reporting requirements. In addition, the NRC database often includes multiple reports for the same spill. The response agencies—EPA and the Coast Guard—are required to assess each reported spill and therefore should have reliable spill information based on their investigations, but this is not the case. EPA Region 5 does not remove all duplicate spill reports, or update its data after investigating spills. Furthermore, investigators do not consistently document their activities, so it is unclear which spills have or

have not been investigated. In contrast, Coast Guard officials in District 9 document their investigations and use the information to update their spill data, but they do not update spill volume estimates after investigations because of automated system limitations that do not allow them to input revised estimates. As a result, complete information on the extent of spills is not available to determine if additional management or oversight is needed to address the problem. Finally, we also found that, according to agency data sets, other events—CSOs and industrial permit violations—occurred more frequently than spills in the corridor.

There are multiple parties involved in spill notification in the corridor and agreements outlining U.S.–Canadian notification processes are not explicit about reporting times or the magnitude of spills that warrant notification. Generally, spill notification involves the following: (1) spill occurrence and reporting by a responsible party or observer to a designated reporting center or a response agency; (2) spill notification from response agencies to one another if determined to be necessary; and (3) spill notification by response agencies to drinking water facilities and other stakeholders. All spill notification is dependent upon reporting by parties responsible for the spill or others who provide initial notification of the spill. Spill notification processes between the United States and Canada are outlined in two agreements between the countries. One process is used by the coast guards of each country, who have agreed to notify one another of spills primarily when a joint response may be needed. Another process is used at the state and provincial level, where officials from the Michigan State Police and Ontario Ministry of Environment have an agreement to notify one another of spills. However, these two agreements are not explicit about what constitutes timely reporting or what magnitude of spill triggers notification. According to Michigan State Police officials, the Michigan–Ontario notification agreement was meant to, among other things, expedite the dissemination of information to the public, because responsibility for notifying the public—including drinking water facilities—generally resides with state and local authorities. We reviewed six selected spill incidents to gain insight into the dynamics of spill notification processes from initial reporting to drinking water facility notification. The drinking water facility operators we contacted on the U.S. side of the corridor had differing perspectives on current notification processes, and the majority expressed concern that their facilities could be contaminated by spills if notification was not timely. Finally, efforts have been made to develop informal notification processes between individual industries or trade associations and drinking water facilities.

EPA's spill prevention efforts are limited to potential oil spills, whereas the scope of the Coast Guard's efforts are broader and included as part of other compliance activities. EPA's Spill Prevention, Control, and Countermeasure (SPCC) program addresses only oil spills, not spills of other hazardous substances. Agency officials told us that their spill prevention regulations were written when oil spills were a bigger problem, and they believed that the NPDES program already addressed chronic pollution discharges in waterways. Unlike EPA's NPDES program, which requires facilities to obtain a permit to discharge pollutants, the SPCC program has no mechanism to identify the facilities that it regulates. This creates a challenge in determining which facilities are required to create spill prevention plans. To date, EPA has not identified the universe of facilities to be inspected under its SPCC program. EPA Region 5 officials have identified 59 facilities in the corridor that are regulated under the SPCC program as a result of referrals from Michigan DEQ or through special inspection initiatives. Inspections for SPCC program compliance vary in number per year and are largely contingent upon other inspection initiatives because of limited numbers of inspection staff, according to agency officials. The inspections that were conducted disclosed significant and numerous spill prevention deficiencies, such as failure to prepare prevention plans. On the other hand, the Coast Guard inspected a greater number of the facilities and vessels under their jurisdiction than EPA—mainly because the inspections were not only focused on spill prevention, but included other areas related to safety and security. Officials from the Coast Guard reported that in nearly all cases, their inspectors found that facilities and vessels were in compliance; those that were not in compliance had only minor issues, such as incidental omissions in operations manuals. In response to violations for spills or program noncompliance, EPA and the Coast Guard issued a total of 16 penalties. From 1994 through 2004, EPA Region 5 fined four parties an average of $39,000 each; three were for violations of the spill prevention program and one was for a spill. In assessing reported spills, EPA relies on Michigan DEQ to respond locally and does not respond on-site to the majority of spills reported to them. Therefore, it does not collect evidence from many reported spills that could be used to take enforcement actions against responsible parties. In contrast, officials from the Coast Guard told us they investigate all spills reported to them, both on-site and indirectly (e.g., through inquiries). Based on these spill investigations, the Coast Guard's District 9 fined 12 parties an average of about $2,100 each in the time frame we reviewed. Neither agency fined parties for failure to report spills.

To improve spill management, we are making recommendations to EPA and the Coast Guard aimed at providing better documentation of spill

investigation results, and identification of possible enhancements to the notification process. We are also recommending that EPA develop an inventory of facilities that are subject to its spill prevention program and develop goals for the frequency and extent of its inspections for such facilities.

In commenting on a draft of this report, the Department of Homeland Security (DHS) agreed overall with our findings and conclusions, and EPA provided technical comments only. DHS did not address our recommendations. In commenting on our recommendation that it gather information on SPCC-regulated facilities, EPA stated that there is no authority in the Clean Water Act or the prevention regulations for facilities to provide this information to EPA. Furthermore, it stated that under the Paperwork Reduction Act the agency would need to seek approval from the Office of Management and Budget to collect such information. In this regard, we note that EPA has previously identified SPCC-regulated facilities in the corridor. However, if EPA determines that formal rulemaking is necessary for it to gather information on which facilities are covered under its spill prevention program, then we believe it should consider undertaking such a rulemaking. EPA also commented on the feasibility of updating spill information maintained by the NRC. While we acknowledge that EPA does not modify spill data maintained by the NRC, our recommendation was that EPA update its own spill data and explore the feasibility of updating spill information maintained by NRC by informing the NRC of duplicate spill reports.

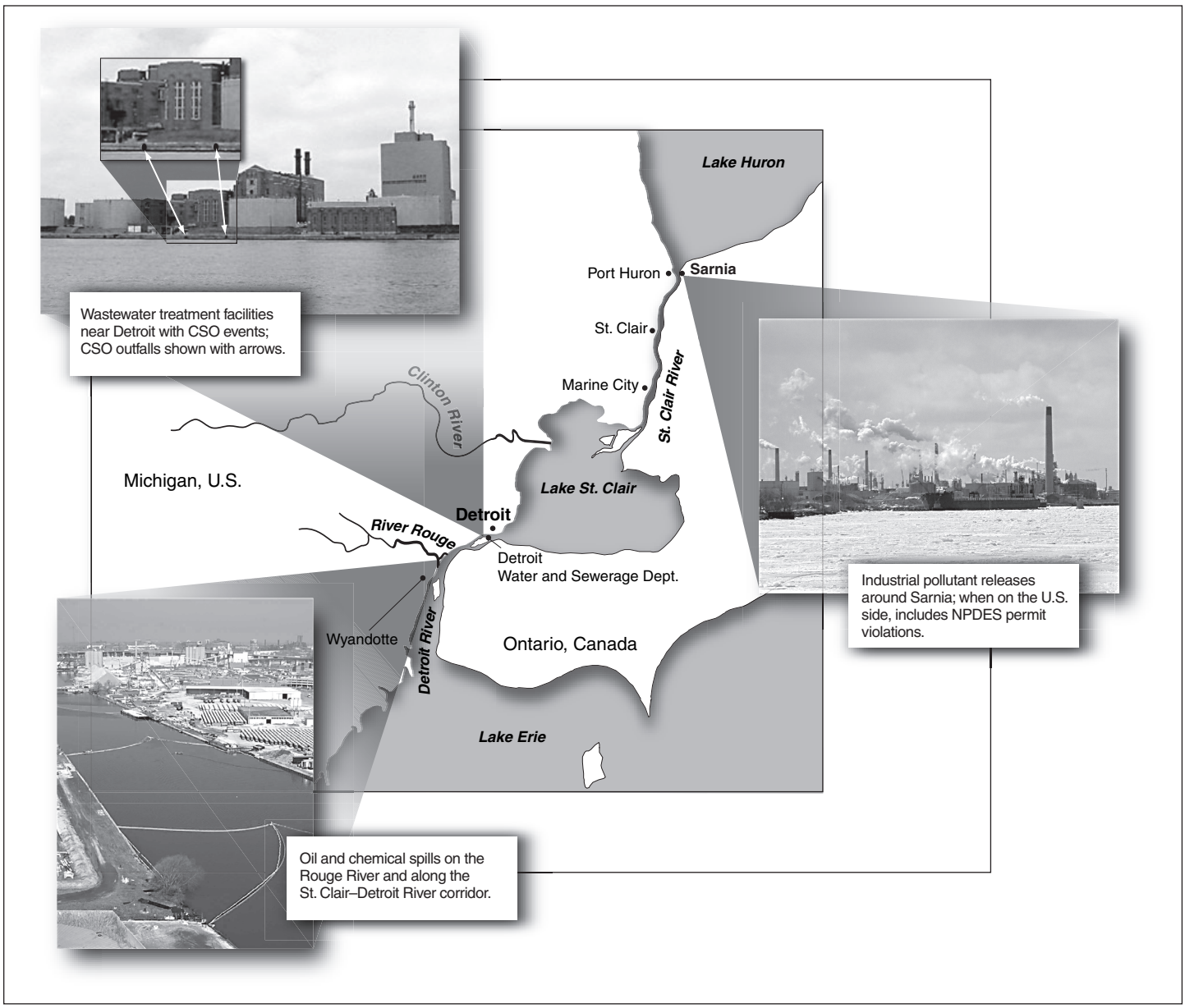
Background

The St. Clair and Detroit Rivers, and Lake St. Clair, provide multiple benefits to residents of Michigan and Ontario, Canada, who use the water bodies as their primary source of drinking water as well as for recreation such as boating and fishing. Sensitive ecological areas located along the corridor include Humbug Marsh, the last Great Lakes coastal marsh on the Michigan mainland of the Detroit River. It contains the greatest diversity of fish species found in the Detroit River and it is part of the migration route for 117 fish and 92 bird species. The Detroit River itself was designated an American Heritage River in 1998 for these ecological resources. Despite these and other benefits, the St. Clair and Detroit Rivers are considered "Areas of Concern" by the U.S. and Canadian governments under the Great Lakes Water Quality Agreement as a result of beneficial-use impairments, such as restrictions on fish consumption.

Pollutant discharges to the waters of the corridor include CSOs—caused by heavy rains that force wastewater treatment plants to bypass their

overburdened systems and discharge raw or partially treated waste directly into the water bodies. Michigan law requires that wastewater treatment facilities report their combined and sanitary sewer overflows to the Michigan DEQ within 24 hours. Discharges from industrial facilities with NPDES permits account for additional pollutants that enter the waters of the corridor. Industries with NPDES permits are required to report on the quality of all discharges and to detail any pollutants discharged that exceed their permit limits to EPA in monitoring reports at intervals specified in their permits, commonly monthly. As a result, NPDES-permitted industries regularly monitor their discharges. In addition to these requirements, federal law requires that parties that discharge oil or a hazardous substance beyond specified quantities into waters of the corridor report these incidents to the NRC. Spills and other pollutant discharges might also be reported to the NRC by members of the public that observe pollutant materials in waterways. When spills, industrial permit violations, and sewer overflows contain oil, they are visible—and more likely to be reported by observers. In contrast, releases of chemicals into the water are oftentimes not visible, unless they can be detected by their effects, such as fish kills. Figure 2 illustrates these sources of pollution.

Figure 2: Pollution Entering the St. Clair–Detroit River Corridor from Sources Such as Spills, Industrial Permit Violations, and CSOs



Sources: GAO, top and right photos; bottom photo U.S. Coast Guard; map, MapArt.

While EPA has federal regulatory responsibility for NPDES-related discharges and CSOs, EPA and the Coast Guard share responsibility for spill prevention and response on the U.S. side of the corridor. The National Contingency Plan and the Southeast Michigan Area Contingency Plan describe a geographic division of responsibility between these agencies, but due to EPA's expertise, the Coast Guard may refer chemical spills to EPA even if the spills are in locations otherwise assigned to the Coast Guard.[4] When spills originate on land but impact the navigable waters, both agencies might be involved in response. Within EPA, Chemical Preparedness officials enforce regulations that address chemical release reporting requirements while Oil Program officials coordinate spill response and oil spill prevention inspections. When spills involve industrial permit violations or sewage releases, EPA's NPDES program officials are also involved—but because EPA approved Michigan's NPDES program, Michigan officials are more directly involved in these cases. As agencies respond to spills, they work with responsible parties to ensure that they fund the cost of cleanup activities. If EPA and the Coast Guard's spill responders do not identify the responsible party, however, they may obtain funds from the Oil Spill Liability Trust Fund (Oil Fund) or Superfund to finance their response efforts, including the cleanup.

According to officials from the Coast Guard, notification of potentially affected parties is oftentimes a component of the agencies' spill response efforts. In addition to federal agencies, the Michigan DEQ and State Police also provide spill notification. On the Canadian side of the corridor, the Ontario SAC consolidates spill reports routed to their center, as well as to other agencies. For example, the Ontario Ministry of the Environment has an agreement with Environment Canada under which they receive all spill reports for the federal agency. There are many potential pathways for spill notification in the corridor. The overall process can be divided into spill occurrence and reporting by a responsible party or observer to a designated reporting center; spill reporting from designated spill reporting centers to response agencies; and spill notification from response agencies to stakeholders, including drinking water facilities. Sometimes parts of the process are collapsed; for example, spill reporting centers may notify other stakeholders as well as response agencies. Alternatively, the process

[4]In accordance with Section 10(g) of Executive Order 12580 of January 23, 1987, Coast Guard officials may use an instrument of re-delegation to shift leadership of response efforts to EPA.

can be lengthened if multiple agencies are responsible for notifying other stakeholders in sequence.

Agency Spill Data Are Not Sufficient to Accurately Determine the Actual Number or Volume of Spills

Agency spill data are not sufficient, for multiple reasons, to accurately determine the actual number or volume of spills in the St. Clair–Detroit River corridor. Many spills go unreported because responsible parties may not understand or comply with reporting requirements. On the other hand, there are oftentimes multiple NRC reports for the same spill, since several observers may report them. EPA Region 5 does not remove all duplicate spill reports from their database, or update its data after investigating spills. In contrast, Coast Guard officials in District 9 document their investigations and use the information to update their spill data, but they do not update spill volume estimates because of automated system limitations. Other events, including CSOs and industrial permit violations, are reported more frequently in the corridor.

Agency Officials Believe Responsible Parties May Not Report All Spills

NRC, EPA, Coast Guard, and Canadian officials believe that many spills are never reported, and therefore that spill data do not represent the true number of spills. Though responsible parties are required by law to immediately report spills in amounts beyond certain minimum quantities, agency officials believe they may not do so for a variety of reasons.[5] U.S. and Canadian officials suggested that responsible parties may not be aware of spills, may not understand the reporting requirements, or that they may not want to receive "bad press" or be forced to pay the costs of the cleanup. Reporting by responsible parties and others is critical because only one water quality monitoring station capable of detecting spills exists in the corridor. The Sarnia-Lambton Environmental Association (SLEA), a Canadian industry consortium, maintains a monitoring station south of the highly industrialized Sarnia area. Though SLEA monitors for a suite of chemicals, it does not detect all types of discharges—and while it shares spill data with the Ontario Ministry of Environment, its purpose is not to collect spill-related information for regulatory agencies; rather, it collects the information as a service to SLEA members, as well as agencies and communities.

[5]Responsible parties are required to report spills by the Clean Water Act and Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); Ontario's Environmental Protection Act also requires that parties report spills.

When spills are reported, in many cases the responsible party is unknown. In many of these instances, a member of the public or party other than the responsible party provides information to the NRC. EPA and the Coast Guard's spill data indicate that 67 percent and 29 percent, respectively, of reported spills in the corridor were released from an unknown source in the time period we reviewed. Ontario SAC data indicate that 10 percent of Canadian spills were from an unknown source.

NRC Data Contains Multiple Reports of the Same Spills

Another reason spill data do not accurately represent the number of actual spills is that NRC spill data record some spill events multiple times. The NRC received 991 reports of spills in the corridor from 1994 to 2004, but these may include multiple reports of the same spills.[6] NRC officials are responsible for maintaining a call center for obtaining spill information, and relaying the information to the appropriate agencies that are tasked with response. They are not required to assess whether multiple reports pertain to the same spill, as this would require investigation. NRC officials told us that, as a result, many duplicate spill reports exist. Coast Guard officials from District 9 told us that they could, after investigating spill incidents, identify duplicate spill reports provided by NRC, link these duplicate reports to single spill incidents, and provide that information to the NRC so that they can update their records.

Duplicate reporting has been addressed by Ontario's SAC, which obtained 157 reports of spills on the Canadian side of the corridor during the same time period. Unlike the NRC, the Ontario SAC determines whether each spill report is unique when it records its information. The Ontario SAC is staffed by Ontario Ministry of Environment officials who are responsible both for obtaining preliminary spill information for the province, as well as for determining which spill reports relate to the same incident. The Ontario SAC has a rolling summary of spill incidents on a display screen and on staff computers, which allows them to identify multiple reports that relate to a common incident. (See fig. 3.) The Ontario SAC's Emergency Management Coordinator told us that when these safeguards fail to eliminate a duplicative spill report, subsequent corrections are made.

[6]The NRC spill data include spills greater than 50 gallons (or of an unknown volume).

Figure 3: Ontario SAC With Display Screens Showing Spill Incident Summaries

Source: Spills Action Centre.

To develop a process similar to Ontario's for the U.S. side of the corridor, Michigan State Police officials told us that between 1986 and 1988 state officials explored the option of creating a spills center. At the time, they estimated that it would have cost $2 million to operate and it would have required 10 staff, including a chemical specialist and three shifts of phone operators. This was viewed as prohibitively expensive by Michigan officials, and as an alternative, the State Police and the Michigan DEQ's Pollution Emergency Alerting System (PEAS) began operating as a spill notification system. The PEAS system is used for reporting spills to the Michigan DEQ during non-business hours, including holidays, weekends, and evenings. Spill data from PEAS, however, are similar to NRC data in that they include multiple entries for single spills because each call is logged, rather than each unique spill event recorded.

EPA Does Not Eliminate All Duplicate Spill Reports or Update Spill Information after Investigations

Unlike the NRC, response agencies such as EPA are required to assess each reported spill and therefore should have reliable spill information, but this is not the case. EPA Region 5 does not eliminate all duplicate spill reports because they do not respond on-site to the majority of spills for which they receive reports. EPA Region 5 officials told us that they rely on Michigan DEQ to respond to the majority of spills since they are in closer

proximity. Region 5 officials respond to spills upon receiving a request for assistance from Michigan DEQ officials, and when spills are over 1,000 gallons, EPA officials respond to provide assistance even if they are not requested to do so. They told us that they investigate very few spills on-site—perhaps roughly one percent of spills—due to limited staff resources. Instead, EPA Region 5 officials follow up with state spill responders by phone to obtain more detail on spills. Though their operating protocols state that responders are to complete pollution reports and update spill data after investigation, EPA Region 5 officials told us that responders have not done so typically because they fail to make it a priority. For this reason, EPA officials were unable to tell us which spills in the corridor in our time frame were investigated by their agency. They told us that EPA imports spill data from the NRC and does not make modifications to the data; therefore, EPA's spill data set is of limited use. EPA Region 5 officials providing spill response in the corridor began using a new Web-based spill data system, Web Emergency Operations Center (Web EOC), in the fall of 2004. EPA officials are hopeful that spill responders will update spill information in the system following their investigations; however, they said that it is too soon to tell.

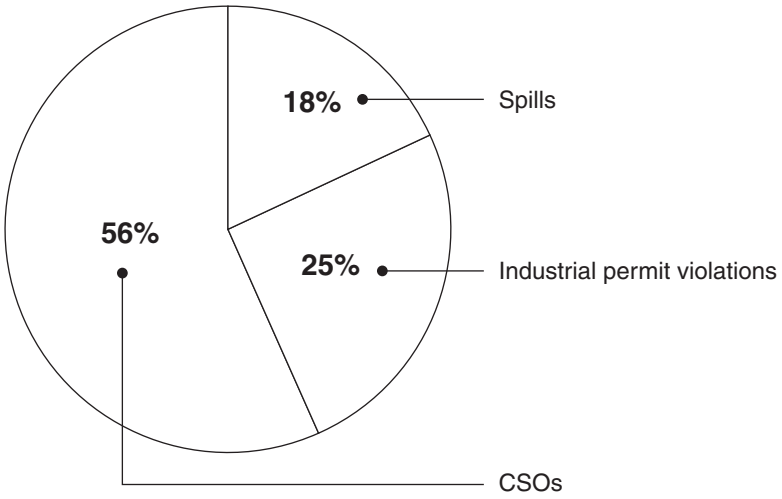
The Coast Guard Updates Most Spill Data but Does Not Update Spill Volumes

Like EPA, Coast Guard officials from District 9 told us that they assess and investigate each spill, whether they go on-site or use phone calls and other means to obtain information; however, Coast Guard officials update spill information following these investigations. While the Coast Guard's spill data sets included information on spill materials, the cause of spills, and how each spill was resolved, the formatting of the data sets makes it difficult to access accurate information on spill volumes. For example, a spill listed in the Coast Guard's data set as being a 2,000-gallon spill is also reported in the Coast Guard's annual report as being over 8 million gallons. Similarly, the Coast Guard's spill data set contains a reference to a 75-gallon oil spill, but summaries written by the Coast Guard's District 9 responders to the spill state that over 66,000 gallons of oil were recovered. When asked about the discrepancies in these cases and others, Coast Guard officials from District 9 told us that they are unable to update the field in their database that contains preliminary volume estimates. Instead, they update volume information in narrative fields. As a result, it is difficult to assess the severity of any given spill in the Coast Guard's data sets.

Number of Reported CSOs and Industrial Permit Violations Exceed the Number of Reported Spills in the Corridor

The number of reported spills is exceeded by other types of events, such as CSOs and industrial permit violations that are reported more frequently in the corridor. EPA's data on U.S. industrial permit violations indicate that approximately 2,200 were reported in the corridor during the 11-year time period we reviewed; over 1,800 were greater than 50 gallons (or of an unknown volume). Michigan DEQ has tracked CSOs on the U.S. side of the corridor since 1999. Their data indicate that roughly 1,400 CSOs were reported in the corridor from 1999 to 2004. These data might be subject to the same limitations as the spill data because industrial permit violations and CSOs are self-reported and facilities may not report all of these events. However, spills may be particularly subject to underreporting because they are not part of a structured program—as CSOs and industrial permit violations are. Figure 4 illustrates the relative percentages of spills, industrial permit violations, and CSOs of greater than 50 gallons (or of an unknown volume) that were reported in the corridor in the 6-year period between 1999 and 2004, the time period for which CSO data were available.

Figure 4: Relative Percentages of Reported Spills, Industrial Permit Violations, and CSOs from 1999-2004 in the St. Clair–Detroit River Corridor That Were Greater Than 50 Gallons (or of an Unknown Volume)



Source: GAO analysis of EPA, Coast Guard, Michigan DEQ, and Ontario Spills Action Centre spill data; Michigan DEQ combined sewer overflow data, and EPA industrial permit violation data.

Notes:

(1) Percentages do not total 100 due to rounding.

(2) This chart depicts the frequency, rather than the toxicity, of pollutant events. The data used to determine relative frequencies are limited by their reliance upon self-reporting by facilities.

Typically, CSOs in the corridor contain biological waste, commercial and industrial waste, and storm water runoff from streets and other surfaces. In the Detroit area, however, CSOs are more likely to contain industrial waste in concentrations that have the potential to negatively impact water quality to a greater extent. In addition to sewage from 3 million area customers and 78 municipalities that send their waste to the Detroit plant, the wastewater treatment facility treats industrial waste from over 250 major industries. The facility has approximately 80 outfalls and is one of the largest wastewater treatment plants in the world.[7] While the facility has an industrial pretreatment program that requires that industries' waste meets certain limits before treatment, these limits may be relatively lenient, according to EPA officials, resulting in high volumes of waste flowing into the facility. For example, EPA officials told us that the facility has lenient oil and grease pretreatment limits. In the event of a CSO, the pretreated material that bypasses the Detroit wastewater treatment facility and is discharged into the Detroit and Rouge Rivers may contain industrial waste, including oil, grease, and other materials. The Detroit facility has historically had difficulties complying with permit requirements. To address these deficiencies, EPA filed suit against the Detroit facility in the 1970s and the resulting consent decree has, according to EPA officials, provided a basis for many required changes to improve their facility.[8] However, a lawsuit filed by EPA in the 1980s which related primarily to the facility's industrial pretreatment program was dismissed in federal court.[9]

[7]An outfall is any pipe or conduit used to carry either raw sewage or treated effluent to a final point of discharge into a body of water.

[8]*United States v. City of Detroit*, 476 F. Supp. 521 (E.D. Mich. 1979).

[9]*United States v. City of Detroit*, 940 F. Supp. 1097 (E.D. Mich. 1996) (granting Detroit's motion for summary judgment).

Spill Notification Occurs between and among Many Different Parties and Agreements Outlining U.S.–Canadian Notification Processes Are Not Explicit about Time and Magnitude

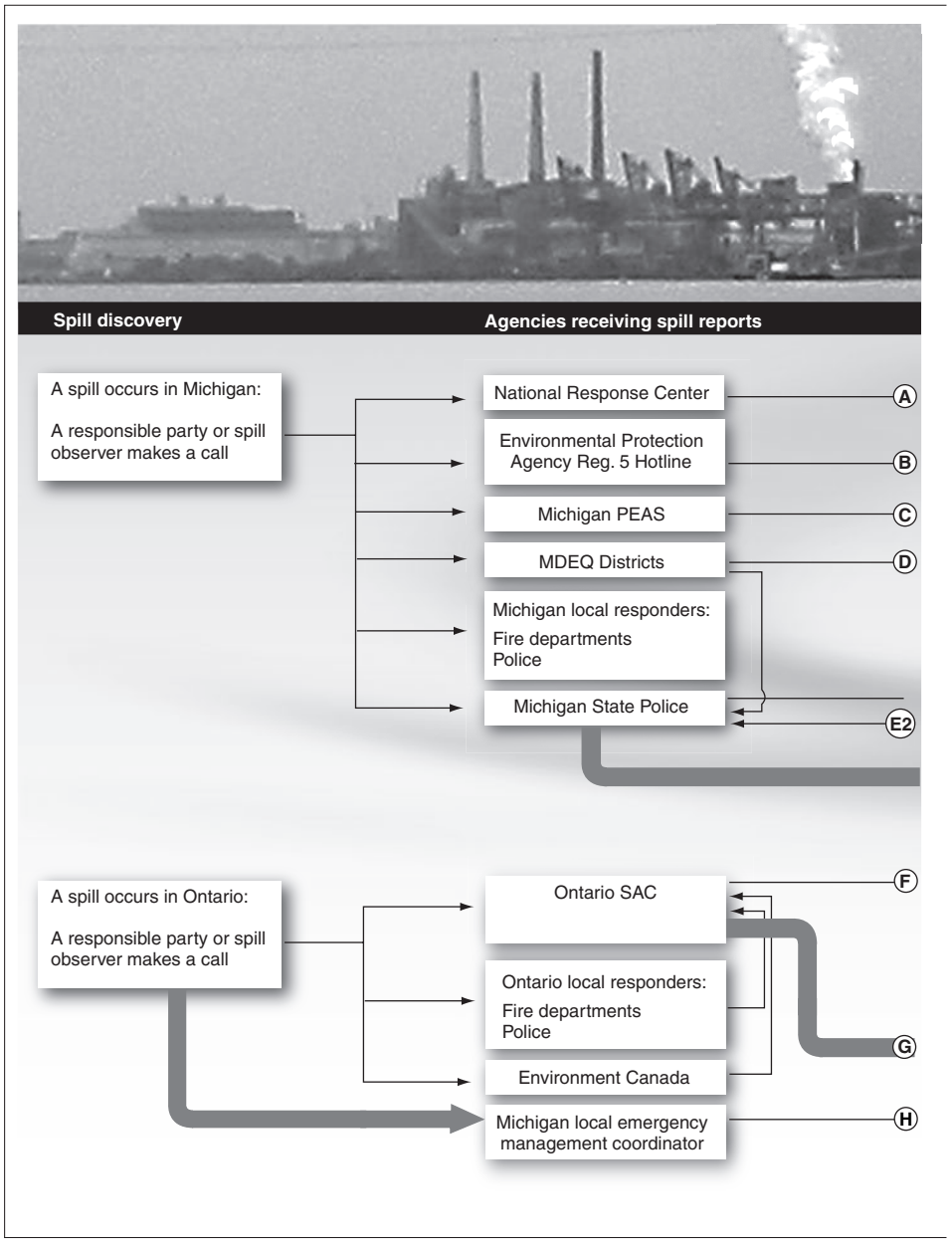
Spill notification may involve the following: (1) spill occurrence and reporting by a responsible party or observer to a designated reporting center or a response agency; (2) spill notification from response agencies to one another; and (3) spill notification by response agencies to drinking water facilities and other stakeholders. Spill notification between the United States and Canada is outlined in two agreements.[10] The coast guards of each country and officials from the Michigan State Police and Ontario SAC have agreed to notify one another of spills; however, these two agreements are not explicit about which spills warrant notification or how quickly notification should occur. We reviewed six selected spill incidents to gain insight into the spill notification process from initial reporting to drinking water facility notification. Drinking water facility operators on the U.S. side of the corridor had differing perspectives on current notification processes, but the majority expressed concern that their facilities could be contaminated by spills due to untimely notification. Finally, efforts have been made to develop informal notification processes between individual industries or trade associations and drinking water facilities.

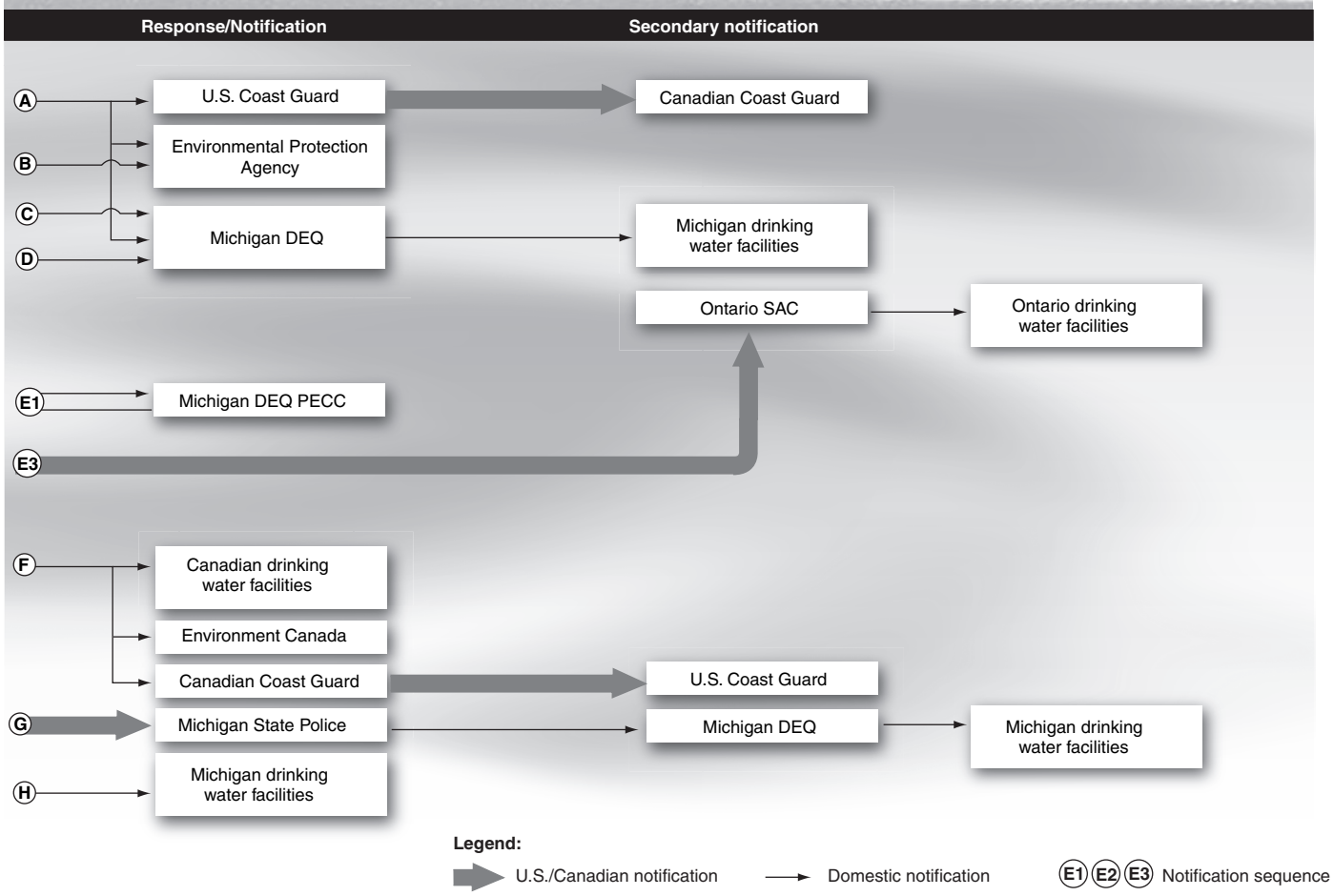
Spill Notification Is Multi-Faceted and May Follow Many Different Pathways

There are several potential pathways through which spill notification may occur in the corridor. The overall process can be divided into spill occurrence and reporting by a responsible party or observer to a designated reporting center or response agency; spill reporting from designated spill reporting centers to response agencies; spill notification from response agencies to other response agencies; and notification to stakeholders, including drinking water facilities. Sometimes parts of the process are collapsed; for example, spill reporting centers may notify other stakeholders as well as response agencies. Alternatively, the process may be lengthened if multiple agencies are responsible for notifying other stakeholders in sequence (see fig. 5).

[10]In addition to these spill notification agreements related to marine spills, the Canada–U.S. Joint Inland Pollution Contingency Plan provides for notification for inland spills. Environment Canada's National Environmental Emergencies Centre notifies the NRC and vice versa. Canadian officials told us the plan, as implemented, addresses mainly air releases.

Figure 5: Spill Notification Processes in the St. Clair–Detroit River Corridor





Sources: EPA, U.S. Coast Guard, Michigan DEQ, Michigan State Police, Michigan drinking water facilities, NRC, Environment Canada, and the Ontario SAC.

Two Agreements Outline Notification between the United States and Canada

The Canada–United States Joint Marine Pollution Contingency Plan states that on-scene coordinators (OSC) from the U.S. and Canadian Coast Guards may notify each other of spills when there is a substantial threat of the spreading of pollutants across shared boundaries, including the St. Clair–Detroit River corridor and other waters of the Great Lakes. The plan arises from the Great Lakes Water Quality Agreement between Canada and the United States that calls for development of a joint contingency plan for use in the event or threat of a spill involving oil or a hazardous substance. The notification called for in the plan is conducted by phone between the two coast guards. They also provide warning messages to each other when they are uncertain as to whether a spill will impact the other's waters; when a joint response is needed to address a spill, they call or communicate via fax. Officials from the Coast Guard told us the plan has only been utilized for joint response twice since 1994. While spill-related warnings have not been systematically tracked between the U.S. and Canadian Coast Guards, officials from the U.S. Coast Guard told us they are starting to track the warning messages to and from Canada. Though U.S. Coast Guard officials may notify Canadian Coast Guard officials of spills, there is no guidance or directive for either party to notify local stakeholders, such as drinking water facilities; however, they told us that they sometimes do so as a courtesy.

Though the U.S. and Canadian Coast Guards have had a spill notification process in place since 1978, Michigan and Ontario officials believed that another notification process was necessary at the state and provincial level to expedite notification of stakeholders such as drinking water facilities. To address this need, the State of Michigan and Province of Ontario agreed in 1988 to contact one another by phone if an unanticipated or accidental discharge of pollutants occurred and the discharge was likely to adversely affect the adjoining jurisdiction or drinking water supply. Michigan State Police were designated as the authority responsible for this task by the state governor because they have the capability to receive information on a 24-hour basis, 7 days a week. According to Michigan State Police officials, this notification process was intended to provide immediate spill-related information to state authorities, who in turn could provide that information to stakeholders such as drinking water facilities. These officials told us that they believe that duplication in notification efforts at the federal and state levels is beneficial, because stakeholders at all levels are more likely to obtain information if multiple processes are involved, since any one system might fail.

The responsibility for communicating spill information to the public generally resides with state and local authorities, who are presumed to be the first agencies on the scene. This responsibility was established in the Emergency Planning and Community Right-to-Know Act (EPCRA) of 1986,[11] which requires states to establish an emergency planning and notification system. This system includes local emergency planning commissions, which are charged with creating procedures for receiving and responding to public requests for information. However, there is no proactive notification requirement in the act for the local planning commissions.

Neither Agreement is Explicit about When or How Quickly Notification Should Occur

Neither the Joint Marine Pollution Contingency Plan nor the Ontario–Michigan Joint Notification Plan contains explicit requirements for what types of spills warrant notification or how quickly notification must be given. For example, Ontario Ministry of Environment officials told us that they classify some sewer overflows as spills. These include sewage bypasses caused by equipment failure, power outages, and maintenance shutdowns. Michigan officials, on the other hand, do not consider these events to be spills because they are regulated separately. U.S. Coast Guard officials said they do not regularly provide information about sewer overflows to Canadian officials, since they are not required to do so, these events occur too frequently, and it would not be feasible to relay information on each occurrence in the corridor. Even when Ontario and Michigan officials agree on what type of event is considered a spill, they told us that they do not have a common understanding of what magnitude of spill requires notification. According to Michigan officials, the agreement does not specify spill volumes that trigger notification, because the agreement's authors were more concerned with spill-material toxicity. Michigan and Ontario officials told us that they have tried to better define when notification is required, but they are frustrated because they have not yet reached consensus on the issue. For example, Michigan officials independently explored the idea of notifying Ontario officials of spills only when spills exceeded 1,000 gallons. Ontario officials, upon learning of this limit, did not agree. They thought this figure was too high and also indicated that volume alone is not an adequate measure of potential impact. In their opinion, other factors such as toxicity and concentration also need to be considered. Since two large chemical spills occurred at Sarnia industrial facilities in 2003 and 2004, Ontario officials told us they

[11]Pub. L. No. 99-499, tit. III, 100 Stat. 1728 (1986).

have notified Michigan officials of spills of various sizes but have not always been informed of large U.S. spills by Michigan authorities. Ontario officials provided some examples of when the Province learned of spills originating in Michigan and impacting Ontario through calls to the SAC from fisherman and other local stakeholders. Michigan State Police officials told us they are uncertain as to whether they are notified of all Canadian spills. These officials have not tracked spill notification to and from Ontario; however, they told us they intend to start doing so.

Though the Ontario–Michigan spill notification agreement specifies that notification is to be immediate for those spills likely to adversely affect the adjoining jurisdiction, officials on both sides told us that they are not always notified in a timely manner. Michigan DEQ officials told us that the greatest lag in the notification process is the time between when a spill occurs and when it is reported by a responsible party to agency officials. Ontario officials told us that they are not always able to notify immediately because some assessment is often required to determine if there is any likelihood of an impact on the U.S. side. Ontario officials also told us that the number of parties or steps involved in the Michigan notification process is greater than those involved in their process, and this could contribute to delays in Michigan's spill notification. A local official from a county bordering Lake St. Clair also told us that the process employed by Michigan State Police and Michigan DEQ officials to notify stakeholders has too many steps, and drinking water facilities are too far down on their list for timely notification. Two local officials told us that Michigan's spill notification process should include electronic communication, rather than relying exclusively on a phone tree, since this provides too many opportunities for communication to be disrupted.

Six Selected Spill Incidents Illustrate the Various Ways Spill Notification Can Occur

Spill notification varies from spill to spill, depending on the unique circumstances of the incident. We selected six spill cases to illustrate the various ways that spill notification can occur. These six cases were chosen to maximize variability among several factors including country of origin, spill material, and whether the responsible party was known. (See table 1.)

Table 1: Characteristics of Six Selected Spill Incidents in the Corridor from 2001–2004

Month/ year	Country of origin	Location	Material	Volume estimate	Responsible party	Cause	Impacts
May 2001	United States	Detroit River	Ethylene Glycol and Propylene Glycol	8.4 million gallons (CG[a]) 25 million gallons storm water/ethylene glycol mixture (RP[b])	Known	Pipe from containment pond to sewer system became blocked	Wildlife injury and death
April 2002	United States	Rouge and Detroit Rivers	Oil/sewage mixture	321,000 gallons of oil (EPA) > 66,000 gallons of oil recovered (CG)	Unknown	CSO-related	Wildlife injury and death Vessel transits delayed, cancelled, and diverted U.S. and Canadian shorelines oiled
August 2004	United States	Rouge and Detroit Rivers	Oil/sewage mixture	5,000 gallons (CG)	Unknown[c]	CSO-related	None documented
August 2003	Canada	St. Clair River	Vinyl chloride monomer	34 and 5 gallon spills (RP)	Known	Cracked tube in heat exchanger	None documented
February 2004	Canada	St. Clair River	Methyl ethyl ketone and methyl isobutyl ketone	> 39,000 gallons (RP)	Known	Leaking heat exchanger	Drinking water facility intake closures
May 2004	Canada	St. Clair River	Oily water	Unknown	Known	Rain caused oil separator overflows	None documented

Source: EPA, U.S. Coast Guard, Ontario SAC, and Michigan DEQ.

[a]CG is an abbreviation for the Coast Guard.

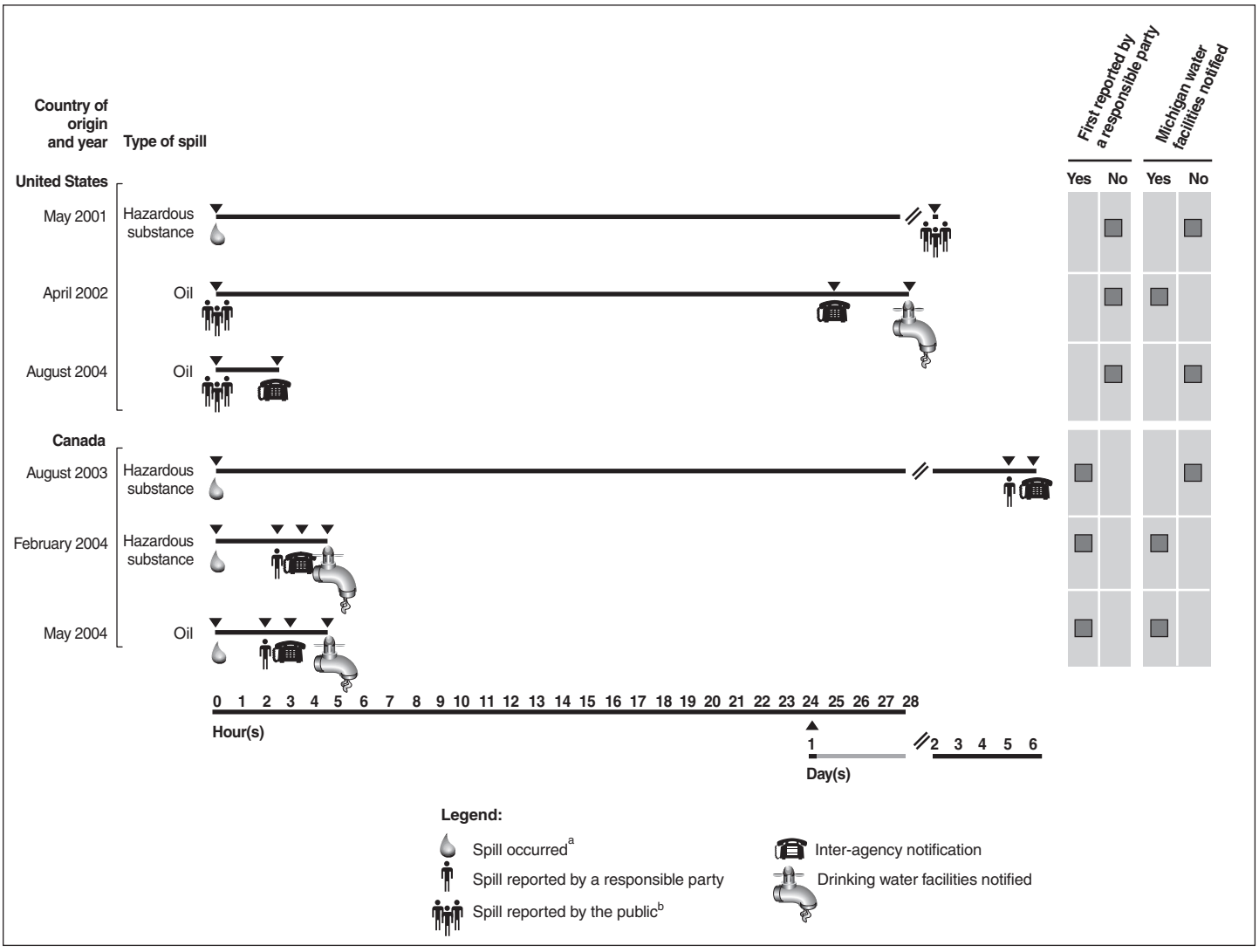
[b]RP is an abbreviation for Responsible party.

[C]In this case, the City of Detroit was held accountable for the spill and another that occurred later that month, because both originated in their sewer system.

In three of the six cases we reviewed, the public, rather than the responsible party, was the first source of spill information to response agencies. In one of these cases, the responsible party later provided the approximate time that the incident occurred and therefore we could calculate the time between spill occurrence and reporting, which was about 24 hours. Notification of agency officials and then drinking water facilities occurred most quickly when the responsible party reported the spill within 2.5 hours of its occurrence. In February and May of 2004, a spill of methyl ethyl ketone and then an oily water spill occurred in Ontario; these entered the St. Clair River. For these spills, Ontario officials

notified Michigan officials within 1 to 2 hours of the spill being reported. Michigan drinking water facilities were then informed of the spill by Michigan officials within the next 1 to 2.5 hours. For these incidents, notification took less than 5 hours, from spill occurrence to notification of drinking water facilities. When responsible parties did not promptly report the spill, the notification process took 2 days or more. For two chemical spills that we reviewed, including an ethylene and propylene glycol spill in Michigan and a vinyl chloride monomer spill in Ontario, the responsible party failed to notify regulatory officials until several days after the spill occurred. The Canadian spill was not detected by the responsible party, because their monitoring equipment was not running as a result of a power outage. The U.S. spill was not detected until a member of the public observed fish dying and reported it to Michigan DEQ officials; the responsible party failed to notify state officials of the spill. In addition, our review of six selected cases illustrated that in five cases, agencies notified one another per the notification agreements. In the case in which they did not, Michigan officials determined that there was no potential impact to Canadian waters. Finally, for the six spills we reviewed, drinking water facilities were not notified in three instances. In these cases, agency officials determined that it was unnecessary to notify the facilities because, in their view, the facilities would not be affected or the information was deemed too late to be useful. Figure 6 shows the notification milestones for the six spills we profiled.

Figure 6: Notification Processes for Six Selected Spills in the St. Clair–Detroit River Corridor



Sources: EPA, Coast Guard, Michigan DEQ, and Ontario SAC.

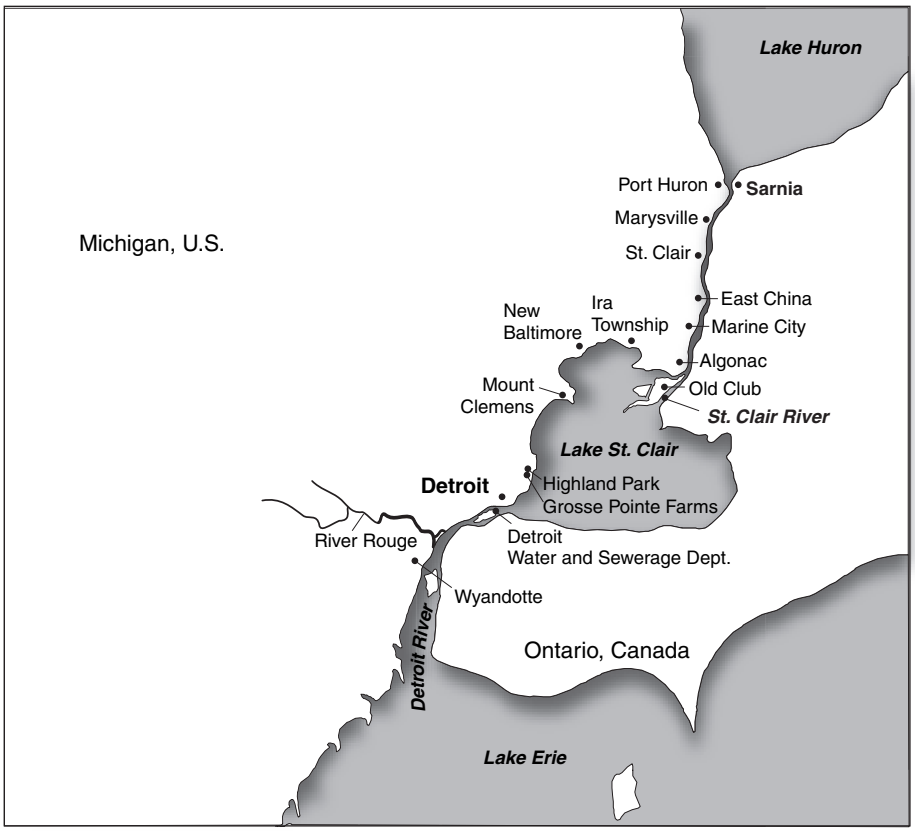
[a]In these cases, the responsible party provided the approximate time the spill occurred.

[b]For the April 2002 and August 2004 spills, the responsible party was not identified and the time the spills occurred is unknown.

Drinking Water Facility Operators' Opinions on Current Notification Processes Varied but Many Expressed Concern That Potential for Plant Contamination Exists

Drinking water facility opinions varied—by location along the corridor—about the timeliness of spill notification. While nearly all drinking water facility operators with facilities along the St. Clair River and northern half of Lake St. Clair told us that spill notification was not timely, almost all facility operators with facilities along the lower half of Lake St. Clair and the Detroit River told us that notification was timely. These facility operators indicated that proximity to spill locations makes a difference in their definition of notification timeliness because they might have more or less time to prepare for spill material to pass their intakes. Figure 7 illustrates the location of U.S. drinking water facilities in the corridor. Despite the difference of opinion on notification timeliness, the majority of the 17 drinking water facility operators all along the corridor told us they would like to be notified of a spill immediately, or within 1 hour or less of its occurrence. In the six spills we profiled, notification never occurred in this time frame.

Figure 7: U.S. Drinking Water Facilities on the St. Clair–Detroit River Corridor



Sources: GAO; map, MapArt.

Furthermore, many Michigan drinking water facility operators along the corridor expressed concern that their facilities could be contaminated by spills. Some cited factors that could increase the likelihood of facility contamination, such as vessel traffic along the corridor or the number of industries located along the corridor. They told us that spill notification plays a key role in whether their facilities might be contaminated. Some told us that spill notification is the most important factor in their ability to protect the drinking water. Two facility operators also indicated that their customers have expressed concerns about the safety of their drinking water. Generally, facility operators located along the St. Clair River and the top of Lake St. Clair seemed to express greater concern than facility operators located along the southern part of Lake St. Clair and the Detroit River. For example, a facility operator in the northern part of the corridor told us that he believes drinking water facility contamination due to spills is "a matter of when, not if." However, Michigan DEQ officials told us that several factors make it unlikely that spills in the St. Clair River will contaminate drinking water:

- Drinking water intakes are 20–30 feet below the water's surface.
- The river has distinct channels, and it is difficult for a pollutant originating on one side of the river to cross these channels.
- At 180,000 to 200,000 cubic feet per second, the river flows so quickly that pollutants are flushed downstream before they affect drinking water.

In contrast, Michigan DEQ officials told us that Canadian drinking water facilities are more vulnerable to contamination from spills in the St. Clair River. These officials noted that Canadian drinking water facilities have shut down more often than Michigan facilities as a result of spills in the corridor. They noted that the most vulnerable Canadian drinking water facility is located on Walpole Island, directly downstream of Sarnia, and it provides drinking water to members of a First Nation community.[12]

Efforts Have Been Made to Supplement Existing Notification Processes

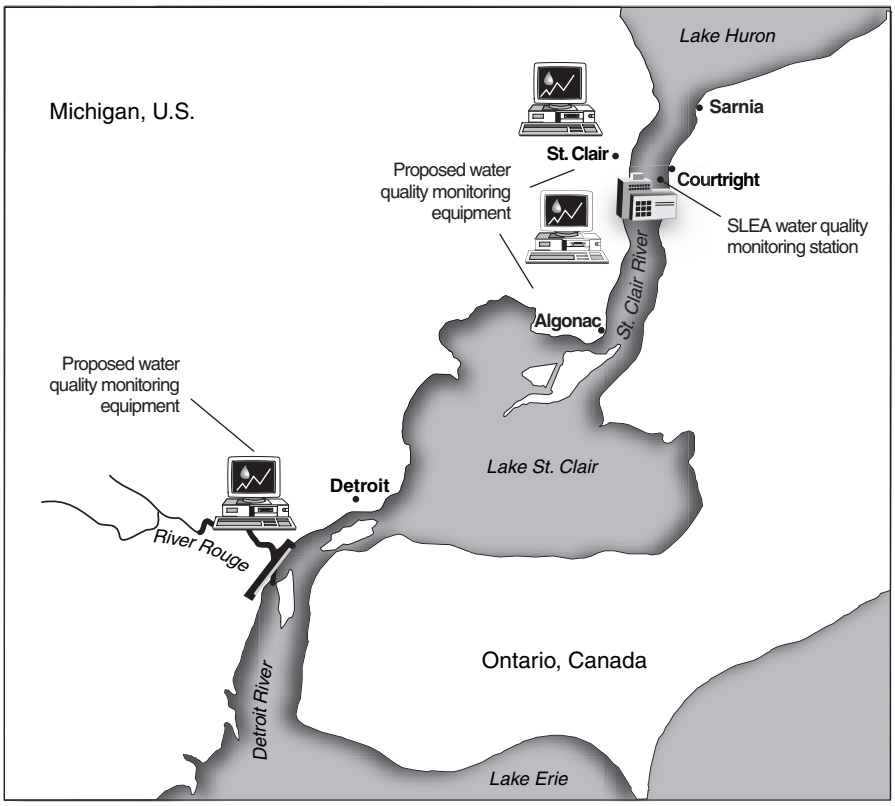
Currently there are, or will soon be, efforts under way to supplement the existing spill notification processes employed by the U.S. and Canadian Coast Guards, and Michigan and Ontario officials. Informal notification

[12]First Nation tribes are composed of indigenous people of North America located in what is now Canada.

processes are already being employed along the corridor. For example, a local emergency management coordinator in the St. Clair River area of the corridor has developed an informal agreement with Canadian industry representatives to call and notify him directly of any spills into the St. Clair River. Upon receiving spill information, he provides the information directly to drinking water facility operators along the portion of the corridor that borders the St. Clair River. Three drinking water facility operators listed him as their first source of spill information. In addition, Sarnia-Lambton Environmental Association (SLEA) officials told us that their member facilities contact Michigan drinking water facilities directly in the event of a spill. Several drinking water facility operators confirmed that they have received notification from members of this consortium of Canadian industries.

In addition, two monitoring systems are being developed by officials from counties bordering the corridor and Michigan DEQ officials, who have obtained federal grants to install spill detection equipment in the St. Clair and Detroit Rivers. These systems are designed to provide spill information directly to drinking water facility operators with water monitoring equipment located near their intakes. One monitoring system, for the St. Clair River and Lake St. Clair, is funded by an EPA grant of $962,200 to Macomb and St. Clair Counties. The other monitoring system, for the Detroit River, is funded by a DHS grant of $760,000 to Michigan DEQ. The officials involved in obtaining both grants told us they are coordinating their efforts so that an overall network of water quality monitors will be more seamless along the corridor. For example, they plan to purchase the same monitoring equipment so that maintenance can be shared. EPA and Michigan DEQ officials estimate that the monitoring systems will be in place in the St. Clair and Detroit Rivers no later than 2007 (see fig. 8). These systems are based on the Ohio River Valley Sanitation Commission's (ORSANCO) spill detection and notification system, established in 1978 to protect drinking water intakes from chemical contamination. For additional information on this system, see appendix VI.

Figure 8: Existing and Proposed Water Quality Monitoring Stations in the St. Clair–Detroit River Corridor



Sources: GAO; map, MapArt.

EPA's Spill Prevention and Enforcement Efforts Are Limited and the Coast Guard Addresses Spill Prevention as Part of Other Compliance Efforts

EPA's spill prevention program addresses only oil spills, and EPA is uncertain as to which facilities are governed by its spill prevention requirements. EPA Region 5 conducted varying numbers of spill prevention-related inspections per year in the corridor for the time frame we reviewed, and their inspections uncovered significant spill prevention deficiencies. In contrast, the Coast Guard's spill prevention efforts include oil and hazardous substances. The Coast Guard's District 9 inspections targeted a greater number of the facilities and vessels they regulate; however, the Coast Guard's inspections were multi-mission rather than focused on spill prevention exclusively. Their inspections revealed minor spill prevention-related issues. In response to spills and noncompliance issues, EPA and the Coast Guard issued a total of 16 penalties in the time period we reviewed.

EPA's Prevention Program Addresses Only Oil Spills

While EPA has the authority to address spill prevention for both oil and hazardous substances, its program only addresses oil. In 1972, in amendments to the Clean Water Act, Congress called for regulations to prevent discharges of oil and hazardous substances; in 1974, EPA's SPCC program became effective. EPA's regulations require non-transportation related facilities with specified oil storage capacities[13] which, because of their location, could reasonably be expected to discharge oil into the navigable waters, to implement a SPCC plan that has been certified by a licensed engineer. These plans should identify the location and types of stored oil, discharge prevention measures, drainage controls, and methods of disposal. Facilities must also meet certain operational standards that include having

- necessary containment structures or equipment;[14]
- periodic integrity tests of containers and leak tests of valves and piping; and
- training for oil-handling personnel on equipment operation and maintenance, discharge procedure protocols, pollution control laws and rules, facility operations, and the contents of their facility's SPCC plan.

In the late 1970s, EPA proposed hazardous substance spill prevention regulations, but they were never finalized. EPA officials speculated that, possibly, these regulations were not finalized because oil spills were more prevalent, hazardous substance spills have shorter-term effects than oil spills, and because EPA focused on the NPDES program to control chronic pollutant discharges.

While EPA's spill prevention program targets oil spills, the Coast Guard's program addresses spill prevention for both oil and hazardous substances. The program applies to facilities or vessels that are capable of transferring oil or hazardous materials, in bulk, to or from vessels of certain minimum capacity. Facilities are required to develop an operations manual, employ

[13]The regulation applies to non-transportation-related facilities with a total above ground (i.e., not completely buried) oil storage capacity of greater than 1,320 gallons, or total completely buried oil storage capacity greater than 42,000 gallons. In addition to the storage capacity criteria, to be regulated, a facility, due to its location, must reasonably be expected to discharge oil into navigable waters of the United States or adjoining shorelines, into the waters of the contiguous zone, or that may affect federal natural resources.

[14]Alternatively, they may explain in the SPCC plan why such measures are not practicable.

qualified personnel, and meet equipment standards. The operations manual must contain a description of the facility layout, the location of important equipment and personnel, and a discussion of procedures for transfer operations and emergencies. The manual must also include a summary of applicable laws and information concerning personnel training and qualifications. Also, each facility must have emergency shutdown capacity and specified discharge containment features. Vessels are required to have written transfer procedures for oil and hazardous substances, meet maintenance and equipment standards, and employ qualified personnel.

In addition to the Coast Guard and EPA's prevention programs, the Michigan DEQ has a spill prevention program that is administered in conjunction with their NPDES program. This program requires that facilities that store or use oil or polluting substances, or those that may be deemed a hazard to waters of the state, create and implement spill prevention plans and inform Michigan DEQ of the plan's completion and availability upon request.[15] Michigan DEQ's pollution prevention plans are to include a

- polluting material inventory;
- detailed facility plan, including floor drains and loading areas;
- secondary storage container description; and
- discussion of precipitation management.

The plans are also to include spill control and cleanup procedures and are required to be reevaluated every 3 years (or whenever a material release occurs). If a facility is also subject to EPA's SPCC program, it may submit a combination spill prevention plan that meets both state and federal requirements. If the facility is only subject to the Michigan DEQ's spill prevention planning requirements, it is not required to have its plans certified by an engineer.

[15]Facilities subject to Michigan DEQ's Part 5 Rules are those that meet the definition of oil storage or on-land facility and receive, process, manufacture, use, store, or ship oil, salt, or polluting materials above the specified threshold management quantities (TMQs). The TMQs are: total above ground capacity of 1,320 gallons or one tank larger than 660 gallons of oil; five solid tons or 1,000 gallons of salt; and outdoor use or storage of 440 pounds (or indoor use or storage of 2,200 pounds) of polluting materials.

On the Canadian side of the St. Clair–Detroit River Corridor, the Ontario Ministry of Environment did not have spill prevention regulations in place in the time frame we reviewed. Instead, the Ministry issued orders which required individual companies to conduct spill prevention planning, or it required spill prevention planning as a requirement for companies seeking a Certificate of Approval, which is required before operating. Due in part to the large chemical spills in 2003 and 2004 originating from facilities in Sarnia, the Ontario Ministry of Environment introduced new legislation under its Environmental Protection Act which addresses the requirement for spill prevention planning.[16]

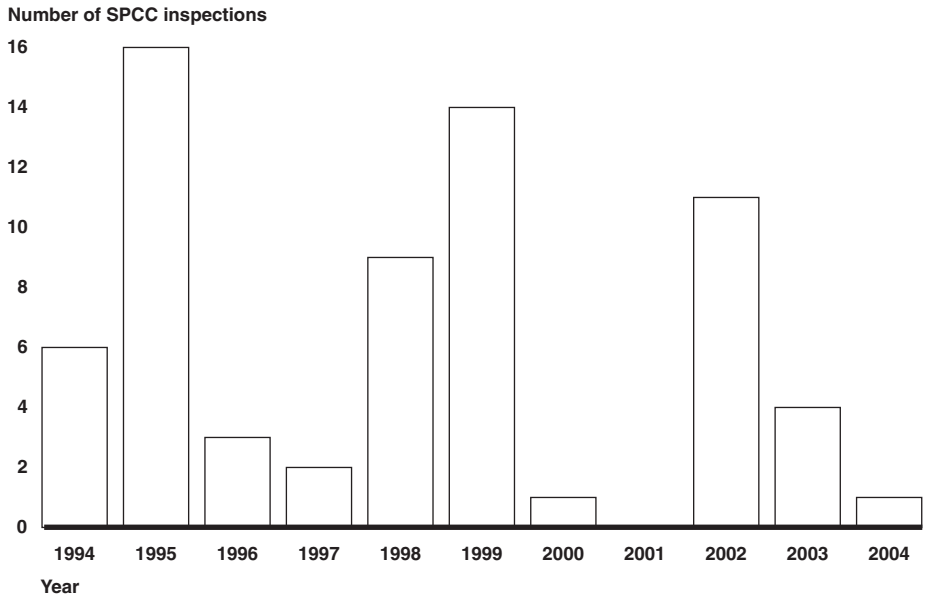
EPA Is Uncertain As to Which Facilities Are Regulated by Its Spill Prevention Program, and Conducts Varying Numbers of Inspections Per Year

EPA Region 5 does not know the universe of facilities that are subject to its spill prevention program requirements and it conducts varying numbers of inspections of known facilities under its jurisdiction in the corridor. Facilities that must comply with SPCC regulations are not required to report to the agency, so EPA does not have an inventory of facilities it regulates. The challenge this presents is not limited to the corridor, as EPA officials are uncertain as to how many facilities should comply with SPCC program requirements nationwide. In the corridor, EPA Region 5 has identified 59 facilities (of a greater number) that are required to meet SPCC requirements, either through special multi-media inspection initiatives or by referrals from Michigan DEQ.

While SPCC plans must be reevaluated and reviewed every 5 years, a specified inspection frequency is not contained in EPA's regulations. EPA officials in Region 5, which encompasses the corridor, rely on roughly three SPCC inspectors to conduct all plan reviews and provide all compliance assistance for facilities in the six-state region. According to these officials, with current SPCC resource constraints, they could only inspect facilities once every 500 years or more. From 1994 to 2004, EPA Region 5 inspected an average of 10 percent of the 59 known SPCC-regulated facilities in the corridor per year. (See fig. 9.)

[16]Section 91.1 of the act requires implementing regulations that were not finalized as of the issuance of this report.

Figure 9: Number of SPCC Inspections Conducted in the St. Clair–Detroit River Corridor from 1994–2004



Source: GAO analysis of EPA data.

Note: In 2001, EPA Region 5 did not conduct any SPCC inspections in the corridor.

EPA Region 5 inspected a number of these SPCC-regulated facilities as part of several multi-media inspection efforts conducted by their Enforcement and Compliance Assistance Team, including the Detroit River and Flyway Enforcement and Compliance Assistance Initiative. This effort identified and inspected 28 facilities in the Detroit area for compliance with multiple EPA programs, including the SPCC program; some of the inspected facilities overlap with a portion of the facilities along the corridor. When SPCC program officials inspect a facility they use a standardized approach, which includes the following:

- an in-depth review of the facility's SPCC plan;
- an interview with the facility owner or operator;
- a physical inspection of the facility;
- a verification of equipment, containment structures, and buildings;

- a review of facility inspections and training records; security and integrity testing; and

- verification that the facility's SPCC plan has been certified by a licensed engineer.

While EPA has a separate program for spill prevention, the Coast Guard addresses spill prevention during its routine safety and security inspections of facilities and vessels. The Coast Guard's District 9 regulates over 100 facilities and 23 vessels stationed in the corridor, as well as vessels that travel through the corridor. It also regulates the transfer of oil and hazardous substances. The Coast Guard inspects facilities and vessels to a much greater extent per year than EPA; however, its inspections are multi-purpose rather than focused exclusively on spill prevention. The Coast Guard's annual facility inspections incorporate spill prevention components that are similar to EPA's SPCC inspection components, but their material transfer inspections and spot checks are not comparable to EPA's focused spill prevention inspections. From 1994 to 2004, the Coast Guard's District 9 inspected an average of 44 facilities, 135 vessels, and 30 material transfer events per year, for safety, security, and pollution prevention requirements. When material transfer events are excluded, the Coast Guard inspected, on average, about 44 percent of the facilities in their jurisdiction per year—compared to EPA's inspections of roughly 10 percent of the known SPCC-regulated facilities. However, we are uncertain as to how many of the Coast Guard's yearly inspections were on-site inspections that are comparable to EPA's SPCC inspections as opposed to spot checks or other multi-purpose inspections that the Coast Guard conducts. The Coast Guard conducts regular on-site inspections that consist of a check of maintenance and operation procedures, as well as a facility or vessel's spill prevention planning. For their annual facility inspections, Coast Guard officials review, among other items:

- contents of operations manuals, including specifications for containment equipment;

- transfer equipment requirements, including an examination of transfer pipes for defects; and

- facility operations, including whether the designated person in charge has certification of completion of required training.

While some inspections are conducted on-site, the Coast Guard also conducts remote examinations, such as viewing a transfer of materials from a distance using binoculars. The specific type and number of inspections conducted by the Coast Guard from 1994 through 2004 is shown in table 2.

Table 2: Number of Coast Guard Facility, Vessel, and Transfer Inspections Conducted in the St. Clair–Detroit River Corridor from 1994–2004

Year	Facility inspections	Vessel inspections	Material transfer inspections	Total inspections
1994	92	157	37	**286**
1995	63	172	36	**271**
1996	42	181	33	**256**
1997	22	166	44	**232**
1998	17	151	19	**187**
1999	16	89	40	**145**
2000	14	94	62	**170**
2001	29	122	33	**184**
2002	31	152	14	**197**
2003	31	99	10	**140**
2004	131	100	—[a]	**231**
Total	**488**	**1,483**	**328**	**2,299**

Source: GAO analysis of the Coast Guard's data.

[a]Data were not provided for 2004.

In addition to EPA and the Coast Guard, the Michigan DEQ inspects facilities for compliance with its spill prevention program during its regular NPDES program inspections. According to Michigan DEQ officials, their inspectors do not keep track of the number of spill prevention inspections conducted or deficiencies found due to a lack of funding for its spill prevention program. Further, the universe of facilities regulated by its spill prevention program is unknown—but approximately 400 facilities that are in Michigan DEQ's Southeast District, which is a larger area that includes the U.S. side of the corridor—have submitted certified spill prevention plans. On the Canadian side of the corridor, Ontario's Ministry of Environment conducts inspections that include a spill prevention component. Ministry of Environment officials were able to provide inspection data from 2003 to 2005, which indicated that they inspected roughly 35 petrochemical and related facilities per year. The inspections conducted in 2004 and 2005 reflect the work that an "Environmental SWAT

Team" conducted.[17] The focus of this special initiative was on facilities with the potential for future spills that could pose risks to human health and the environment. The inspections included a comprehensive review of the facilities' air emissions, water discharges, and spill prevention and contingency plans.

EPA Inspections Uncovered Significant Spill Prevention Deficiencies, Whereas the Coast Guard's Inspections Revealed Minor Issues

EPA Region 5 officials told us that the spill prevention inspections they conducted from 1994 through 2004 disclosed significant and numerous deficiencies, such as failure to provide for secondary containment or failure to prepare spill prevention plans. For example, an SPCC inspector found that one company failed to prepare its SPCC plan within 6 months of beginning operations, and failed to implement its plan within 1 year. In addition, the facility never had its SPCC plan certified by a professional engineer. The SPCC inspector found that another facility had no additional containment around some bulk storage tanks, and it failed to amend its SPCC plan as required. In contrast, Coast Guard officials from District 9 told us that their inspections revealed that nearly all facilities and vessels were in compliance, and those that were not had only minor noncompliance issues related to spill prevention, such as incidental omissions in operations manuals. For example, Coast Guard officials found instances in which a facility operator initialed only one section of a required form, rather than at multiple sections. The Coast Guard officials also found other minor violations that related to aged hoses outside their service life and inadequate lighting.

Michigan DEQ officials told us that their inspections revealed that some facilities do not have spill prevention plans, or did not certify compliance with them. In some cases, facilities that already had some secondary containment or protection in place needed further upgrades in order to come into compliance with the state's spill prevention requirements. For example, during one inspection, Michigan DEQ found that a facility had developed a spill prevention plan, but it was not adequately managing its materials in order to prevent storm water from contacting the materials and discharging them into the waterways. On the Canadian side, Ontario's Environmental SWAT Team found that 34 of the 35 facilities inspected in

[17]The Environmental SWAT Team is a specialized group that can be rapidly deployed to address critical environmental issues. It complements ongoing work that the Ministry of Environment, including its district offices, pursues, including inspection and enforcement activities. The 2004 inspections in the Sarnia area were the result of concerns raised by chemical spills that occurred in 2003.

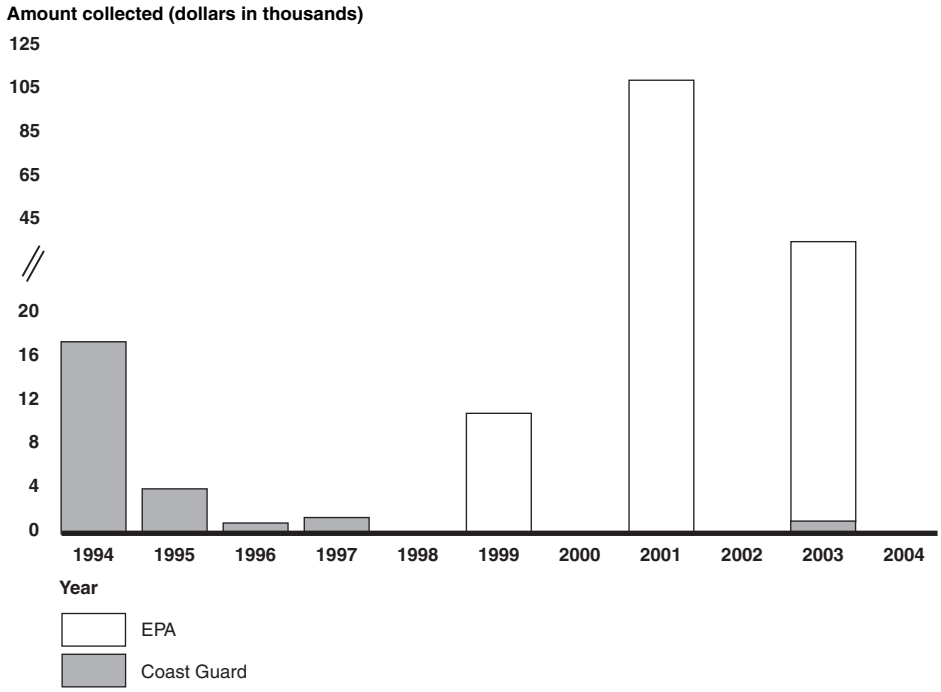
2004 and 2005 were not in compliance with one or more legislative and regulatory requirements. Eight facilities did not have spill prevention and contingency plans. Other deficiencies found during inspections included:

- a Certificate of Approval was not obtained for operations;
- equipment, systems, processes, or structures were altered contrary to the existing Certificate of Approval; and
- chemicals were improperly handled, stored, and identified.

EPA and the Coast Guard Issued a Total of 16 Penalties during the Period Reviewed

EPA and the Coast Guard issued 16 penalties in response to spills, noncompliance with spill prevention programs, or for failure to report spills during the period we reviewed. EPA Region 5 issued four penalties, primarily for SPCC violations, that were assessed at an average of $39,000 each during the 11-year period. During the same time period, the Coast Guard's District 9 issued 12 penalties for spills that were assessed at an average of $2,100 each. See figure 10 for total amounts of penalties assessed by EPA and the Coast Guard per year from 1994 through 2004.

Figure 10: EPA and Coast Guard Spill-Related Penalties Assessed from 1994 to 2004 in the St. Clair–Detroit River Corridor



Source: GAO analysis of EPA and Coast Guard data.

Note: In 1998, 2000, 2002, and 2004 no financial penalties were issued by EPA or the Coast Guard.

EPA Region 5 officials told us they rely primarily on assisting companies in coming into compliance with spill prevention program regulations, and they pursue enforcement actions and issue financial penalties when companies fail to respond to their assistance. They also explained that limited staff resources are available to pursue enforcement actions. EPA Region 5 has the equivalent of roughly one and a half full time staff persons devoted to spill-related enforcement duties conducted by the Office of Regional Counsel and the Oil Program. The Oil Program is responsible for determining noncompliance with the SPCC program, which entails establishing a history of spills or noncompliance; it is then responsible for determining penalty amounts.

Determining noncompliance and identifying responsible parties for spills, however, can be problematic for EPA. While EPA Region 5 officials told us they use their spill data when pursuing an enforcement case, the agency,

for most spills, does not confirm the validity of the spill data or gather additional information. Michigan DEQ responds to most reported spills in the corridor, but EPA Region 5 does not coordinate with Michigan DEQ to collect information for enforcement purposes. It is EPA's policy to collect spill information directly because, according to EPA officials, it is preferable to have first-hand knowledge in the event that staff have to testify or provide a deposition for an enforcement case, among other reasons. To gather additional information, Oil Program officials stated that they send requests to facilities for spill-related information that they can then use in enforcement cases. If spill information is obtained, EPA Region 5 officials told us that their informal policy is not to pursue an enforcement case when the proposed penalty is less than $11,000 or the spill involves less than 100 gallons or two barrels of oil. They also stated that in most cases for which they issued a penalty, the amounts were ultimately reduced substantially through negotiations with the responsible party. For example, one facility was issued a financial penalty of approximately $320,000 for a spill prevention violation and the negotiated final payment was $25,000.

Like EPA, the Coast Guard relies primarily on assisting companies in coming into compliance with spill prevention program regulations. The average financial penalties that were assessed by the Coast Guard's District 9 were relatively low compared to the maximum financial penalty of $32,500 that it has the authority to issue for a spill violation. Coast Guard officials from District 9 told us that, in determining penalties, they take into account how much a facility or vessel owner has already paid for the cost of cleaning up a spill.[18] In regard to why no penalties were assessed for spill prevention program violations, officials from the Coast Guard stated that they have the authority to order a facility or vessel to cease operations if it does not comply with their spill prevention program, and this serves as a strong deterrent to noncompliance. They added that large financial penalties have not been needed due to the cooperation of companies coming into compliance with their prevention regulations.

[18]Coast Guard officials stated that penalties are determined by hearing officers based upon multiple factors, including the size of the spill, the product discharged, the environmental or economic sensitivity of the impacted area, the measures in place by the responsible party to prevent discharges, the steps taken by the responsible party as a result of the discharge toward preventing further discharges, as well as the financial impact of the cleanup operations.

Similar to the Coast Guard, Michigan DEQ did not issue penalties for noncompliance with their spill prevention program in the time frame we reviewed. Michigan DEQ did, however, issue four penalties averaging $35,000 to responsible parties for spills in the corridor. Michigan DEQ also issued three penalties for multiple violations including spills and industrial permit violations; the penalties totaled approximately $300,000. Lastly, in Ontario, the Ministry of Environment did not have the authority to issue administrative penalties for spills until 2005.[19] Prior to that time, the Ministry of Environment pursued spill-related penalties through the provincial court system and from 2002 to 2004, four facilities were assessed penalties averaging approximately $171,000 in U.S. dollars after successful prosecutions.

In addition, though EPA and Coast Guard officials acknowledge that spill reporting is not always occurring, the agencies did not penalize responsible parties for failure to report chemical releases in the time period we reviewed. We are, however, uncertain as to how many chemical releases occurred in the corridor due to data limitations. The authority provided under the EPCRA allows EPA officials to penalize regulated industries for failure to report, in a timely fashion, spills of reportable quantities of hazardous or extremely hazardous substances. However, EPA Region 5's Chemical Preparedness officials who administer EPCRA told us that they rely on 30 to 40 information requests sent to companies per year for the entire six-state region to gather the necessary information on reporting in order to pursue enforcement. They stated that, with three staff for the region to enforce the EPCRA and other regulations related to chemical releases, they lack the resources to inspect more than roughly 15 facilities per year to determine compliance with timely notification and other reporting requirements. They did not issue any penalties for failure to report chemical releases in the corridor in the time frame we reviewed. Superfund authorizes EPA and the Coast Guard to issue penalties for failure to report hazardous substance spills, but neither agency did so in the time frame we reviewed. The Clean Water Act, on the other hand, does not authorize civil penalties for a responsible party's failure to notify NRC of an oil spill; only criminal sanctions are available. Michigan DEQ officials may make a criminal complaint or request that the state's Attorney General pursue civil action for failure to report spills; however, they did

[19]Bill 133, also known as the Environmental Enforcement Statute Law Amendment Act, was passed by the Ontario Legislature on June 9, 2005; this legislation provides the Ministry of Environment with the authority to issue penalties for spills.

not in the period we reviewed. On the Canadian side of the corridor, Ontario's Environmental Protection Act provides Ministry of Environment officials with the authority to penalize responsible parties for failure to report spills, as this is a violation of the act. The Ministry did so recently, and the company responsible for a large chemical spill into the St. Clair River in 2003 was charged and convicted of failing to report the spill immediately.

Spill-related penalties that are collected by EPA and the Coast Guard help supplement the funds that provide for response efforts when a responsible party is not identified to pay costs. In these cases, EPA and the Coast Guard may obtain financing from the Oil Fund or Superfund to pay for their response efforts, including the cleanup.[20] But these funds are being depleted by cleanup efforts in the corridor and are not being replenished through the cost recovery process because, in many cases, the responsible parties have not been identified. Fund data maintained by the National Pollution Funds Center show that, from 1994 to 2004,

- approximately $8.4 million[21] from the Oil Fund financed oil spill cleanups in the corridor, for which $80,067 was recovered to offset those expenditures, and
- approximately $17,000 from Superfund financed hazardous material spill cleanups, with no additional funds recovered to offset those expenditures.

Conclusions

Spills of oil and hazardous substances into waters of the corridor continue to be a concern, and agencies responsible for addressing this problem face challenges on several fronts including obtaining accurate spill information, and conducting spill notification and comprehensive prevention efforts. Officials from EPA Region 5 and Coast Guard's District 9 concur that accurate spill information is not available and acknowledge that such information could be improved by better incorporating data, including final spill volume estimates, obtained through their spill response efforts. Coast Guard officials from District 9 also acknowledge that they could help update the NRC's spill information by documenting which duplicative

[20]These funds may also be utilized when the responsible party is known, but unable to pay for spill response.

[21]The 2002 Rouge River spill accounts for approximately $7 million of the total spent in the 11-year time frame.

NRC spill reports are linked to common incidents. Better documentation of response efforts and the results of spill investigations could assist EPA and the Coast Guard in targeting inspection and enforcement efforts to the highest-priority need. Spill notification under the agreement between the United States and Canada, and Michigan and Ontario, while limited, appears to be meeting its intended purpose. Effective spill prevention helps reduce contaminants flowing into waters of the corridor. EPA's spill prevention efforts are hampered by the fact that it does not know the universe of facilities regulated by its program, the scope of its program is focused only on oil, and limited resources are available for implementing the program—particularly for inspections. Given the focus and resource limitations which impact EPA's ability to pursue spill prevention and enforcement activities, EPA could collect information about the facilities that are regulated in order to better define goals for the frequency and extensiveness of their inspections.

Recommendations for Executive Action

To better ensure that spill data are available to target their inspection and enforcement efforts, and to improve the overall effectiveness of spill notification, we are recommending that the EPA Administrator direct EPA Region 5; and that the Secretary of Homeland Security direct the Commandant of the Coast Guard and the Commander of District 9 to take the following two actions:

- maintain and update spill information to include the results of investigations and explore the feasibility of updating spill information maintained by the NRC, and
- determine whether existing spill notification processes can be improved or modified to provide reduced and consistent notification time frames.

In addition, to better utilize spill prevention resources, we recommend that the EPA Administrator consider gathering information on which facilities are regulated under its spill prevention program. We also recommend that the EPA Administrator direct Region 5 to develop goals for the frequency and extensiveness of its inspections.

Agency Comments and Our Evaluation

GAO provided a draft of this report to EPA and DHS for review and comment. DHS provided comments on the draft report and generally agreed with our findings and conclusions. EPA provided only technical comments regarding the report. DHS did not address our recommendations. EPA commented on the feasibility of our

recommendations regarding gathering information on SPCC regulated facilities and updating spill information maintained by the NRC.

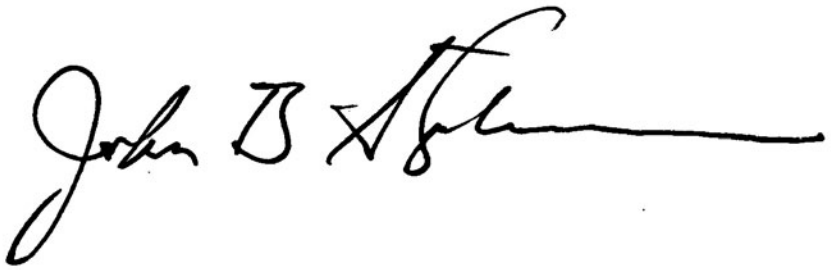
While DHS generally agreed with our findings and conclusions, the agency commented on our observation that the Coast Guard does not update spill volume estimates in its automated spill data system. Specifically, the agency cited an example used in our report and noted that it was the result of unusual circumstances that arose during the transition from one data system to another. In addition, DHS noted that Coast Guard investigators do have the ability to update spill volume estimates in investigative report narratives. We acknowledge that the Coast Guard transitioned from one data system to another in the time frame we reviewed. However, Coast Guard officials told us that with the current data system, initial spill volume estimates cannot be readily updated, except in the narrative of the investigation reports. We acknowledge that investigators do have the ability to update volumes in the report narratives but initial volume estimates cannot be changed in the volume data field of the current system. It is difficult to readily assess the magnitude of spills based on the initial volume estimates contained in the automated spill data. Furthermore, Coast Guard officials told us that they would benefit from an additional field in their spill data system which incorporated final spill volume estimates. In addition, DHS commented that additional factors should be considered in our report regarding agency efforts to penalize responsible parties for failure to report spills. DHS acknowledged that the responsible parties for many spills are not identified and, while penalties were not assessed for failure to report spills in the corridor in the time frame we reviewed, DHS stated that the Coast Guard, with the Department of Justice, has successfully prosecuted responsible parties for spills outside the corridor. The full text of DHS's comments is included in appendix VII.

EPA provided the following three comments on our report. First, EPA stated that it does respond to every spill, whether directly or indirectly, in the same way that the Coast Guard responds. However, EPA could not provide documentation of its response efforts whereas the Coast Guard provided documentation that indicated what actions were taken in response to each spill. In addition, EPA stated that its spill responders rely heavily on Michigan DEQ to respond to spills and coordinate response actions with the Coast Guard. EPA also said that it responded directly to greater than one percent of spills—as opposed to less than one percent, as previously stated by EPA officials. Nevertheless, the level of EPA's response is unclear due to lack of documentation. Second, EPA commented on our recommendation that it update spill information

maintained by the NRC. We acknowledge that EPA does not modify spill data maintained by the NRC; however, our recommendation was that it explore the feasibility of updating spill information maintained by the NRC by informing NRC of duplicate spill reports. While EPA maintains that information on spills can now be updated using a new system called Web EOC, and our report acknowledges that Web EOC is a method to update spill data electronically, the extent of its use is uncertain according to EPA officials. Finally, EPA commented on the feasibility of our recommendation that it gather information on facilities that are covered under its spill prevention program. EPA stated that there is no authority in the Clean Water Act or the prevention regulations for facilities to provide this information to EPA. It further stated that under the Paperwork Reduction Act the agency would need to seek approval from the Office of Management and Budget. However, EPA has previously identified SPCC facilities in the corridor. If the agency determines that formal rulemaking is necessary for it to gather information on which facilities are covered under its spill prevention program, then we believe it should consider undertaking such a rulemaking. EPA officials also provided specific technical comments and clarifications on the draft report that we have incorporated in the report as appropriate.

As agreed with your offices, unless you publicly announce the contents of this report earlier, we plan no further distribution until 30 days from the report date. At that time, we will send copies of this report to appropriate Congressional Committees, the EPA Administrator, the Secretary of Homeland Security, and various other federal and state agencies. We also will make copies available to others upon request. In addition, the report will be available at no charge on the GAO Web site at http://www.gao.gov.

If you or your staff have any questions, please call me at (202) 512-3841 or stephensonj@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made major contributions to this report are listed in appendix VIII.



John B. Stephenson
Director, Natural Resources
and Environment

List of Congressional Requesters

The Honorable Carl Levin
United States Senate

The Honorable Debbie Stabenow
United States Senate

The Honorable Sander M. Levin
House of Representatives

Appendix I: Scope and Methodology

We were asked to examine (1) how many oil and hazardous substance spills of more than 50 gallons (or of an unknown volume) were reported in the St. Clair–Detroit River corridor from 1994 to 2004, and how accurately reported spills reflect the extent of actual spills; (2) what processes are used to notify parties of spills, and whether they contain explicit requirements for reporting times and spill magnitude; and (3) the extent of Environmental Protection Agency (EPA) and the Coast Guard's spill prevention efforts and enforcement activities in the St. Clair–Detroit River corridor from 1994 through 2004.

To determine the number of oil and hazardous substance spills of more than 50 gallons (or of an unknown volume) reported in the St. Clair–Detroit River corridor from 1994 to 2004, and to what extent they represent actual spills, we obtained information on spills with those characteristics reported in the St. Clair River, Lake St. Clair, the Detroit River, and a highly industrialized tributary, the Rouge River. We obtained data sets with these attributes from the National Response Center (NRC), EPA Region 5, the Coast Guard's Headquarters, Michigan's Department of Environmental Quality (Michigan DEQ), and the Spills Action Centre (SAC) operated by the Ontario Ministry of Environment. To assess the reliability of each data set we questioned and interviewed knowledgeable officials about the data and the systems that produced them, and manually reviewed the data. Limitations to the data are discussed in the report and in appendix II. When appropriate, we analyzed the data sets individually to determine spill frequency over time and spill characteristics, such as volume and the type of material spilled. We were not able to combine the spill data sets for analysis because each entity tracks spills differently, and we were limited in what we could conclude from the individual data sets because the degree to which they are updated varies widely. We also obtained EPA and Michigan DEQ data sets related to other pollutant discharges, such as combined sewer overflows (CSO) and industrial discharge permit violations, to provide context for the spill data and obtain more complete information on pollutants discharged into the water bodies of the St. Clair–Detroit River corridor. These data are likely subject to the same limitations as the spill data, in that industrial permit violations and CSOs are self-reported and facilities may be reluctant to report these events; however, spills may be particularly subject to underreporting because they are not part of a structured program as are CSOs and industrial permit violations.

To assess what processes are used to notify parties of spills and whether they contain explicit requirements for reporting times and spill magnitude, we reviewed applicable laws and spill notification agreements and

obtained information on implementation of these agreements from EPA, the Coast Guard, Michigan DEQ, the Michigan State Police, and Canadian officials. In addition, we obtained and analyzed documentation on six spills to better understand how the notification process was conducted in specific incidents. We selectively sampled the spill data sets for spills to illustrate the implementation of notification practices under various scenarios, including spills with source locations in both the United States and Canada and spills of differing materials and volumes. We questioned the 17 drinking water facility operators on the U.S. side of the corridor to obtain their perspectives on the timeliness of spill notification. We further obtained information on the automated monitoring system maintained by Sarnia-Lambton Environmental Association, planned automated monitoring on the U.S. side of the corridor, and the monitoring conducted by the Ohio River Valley Water Sanitation Commission.

To determine the extent of EPA and the Coast Guard's spill prevention efforts and enforcement activities in the St. Clair–Detroit River corridor from 1994–2004, we first obtained and analyzed laws, regulations, and agency policies regarding spill prevention and enforcement. This included obtaining information on the potential enforcement penalty dollar amounts. We also obtained data from EPA, the Coast Guard, Michigan DEQ, and the Ontario Ministry of Environment on spill-related enforcement actions taken in the corridor since 1994. We analyzed the information to determine the number of inspections conducted, the types of violations found, and the penalties assessed for each documented violation. Finally, we obtained information from the various agencies on the resources devoted to inspections and enforcement; the use of those resources; and priorities in using the resources.

We performed our work from September 2005 to June 2006 in accordance with generally accepted government auditing standards.

Appendix II: Spill Data for the St. Clair–Detroit River Corridor, 1994–2004

Spill data sets were available from four sources: EPA, the Coast Guard, Michigan DEQ, and the Ontario SAC. Each data set is unique; however, some spill incidents are found in multiple data sets and therefore they cannot be combined or consolidated. The relative quality of each data set depends in part on whether it is updated after additional information is obtained from spill investigations or whether minimal updates are made, as with the EPA spill data set. Generally, all of the spill data sets have a common data reliability limitation which stems from uncertainty regarding whether all incidents are reported. Of note, the data sets for EPA and the Ontario SAC contained a large number of incidents with unknown volumes.

EPA Spill Data

EPA's spill data set is not routinely updated after EPA responders conduct investigations. Therefore, the data reflect preliminary information about spills received from the NRC, and the data likely do not represent the actual number and nature of spills. We are presenting this data for informational purposes only. The data set contained a total of 916 spill incidents that occurred in the St. Clair River, Lake St. Clair, Detroit River, and Rouge River from 1994 through 2004 and that had volumes of greater than 50 gallons (or of an unknown volume). About 45 percent of the spills were oil-related. The number of spills has varied over time, not showing either an increasing or decreasing trend. The EPA data showed that the greatest number of spills occurred in 1994.

Table 3: EPA Spill Data by Year and Material

Year	Oils[a]	Unknown material	Gasoline and fuels[b]	Chemicals[c]	Tars[d]	Waste-water[e]	Other[f]	Total
1994	71	56	20	2	0	0	0	**149**
1995	59	22	11	1	2	0	1	**96**
1996	51	39	8	2	1	0	0	**101**
1997	52	23	14	0	0	0	0	**89**
1998	49	49	5	2	1	1	1	**108**
1999	41	27	16	1	1	0	1	**87**
2000	15	24	5	1	0	0	0	**45**
2001	22	17	5	0	0	0	2	**46**
2002	19	23	8	0	0	0	0	**50**
2003	18	43	12	0	0	0	1	**74**
2004	17	43	7	2	0	0	2	**71**
Total	**414**	**366**	**111**	**11**	**5**	**1**	**8**	**916**

Source: GAO analysis of EPA data.

[a]Spills in the oils category consist of water with oil (2), miscellaneous waste oil (1), hydraulic oil (39), fuel oil (68), miscellaneous oil (152), diesel oil (74), other oil (34), transmission oil (3), waste oil (23), turbine oil (2), edible oils (4), epoxidized vegetable oils (2), capacitor oil (1), petroleum products (1), crude oil (3), compressor oil (1), engine oil (1), sludge oil (1), carbon oil (1), and crank oil (1).

[b]Spills in the gasoline and fuels category consist of automobile gasoline (81), jet fuel (20), kerosene (3), unleaded gasoline (3), gasoline or diesel (1), bunker c fuel oil (2), and fuel and lubricant (1).

[c]Spills in the chemicals category consist of mineral spirits (4), other chemicals (1), solvents (2), paints (2), Anton battery release (1), and hydrocarbon toluene (1).

[d]Spills in the tars category consist of coal tar pitch (3), crude coke oven tar (1), and anthracene oil (1).

[e]Spills in the wastewater category consist of wastewater with vegetable oil (1).

[f]Spills in the other category consist of brake fluid (1), asphalt (3), parking lot runoff (1), industrial waste (1), white foam material (1), and bilge slops (1).

Coast Guard Spill Data

Coast Guard officials update spill data after investigations are conducted, thereby strengthening the reliability of their spill data. However, they are unable to update preliminary volume estimates and therefore these data are likely unreliable. There are 51 spill incidents in the Coast Guard data set and the majority of spills—roughly 70 percent—were oil-related. The Coast Guard's spill data set indicates that 11 spills were traced back to storm or sanitary sewer outfalls. In four of these instances, narratives completed by spill responders indicate that sewage was mixed with other spill materials.

Table 4: Coast Guard Spill Data by Year and Material

Year	Oils	Gasoline and fuels	Coal tar	Chemical	Other	Total
1994	7	1	0	0	0	**8**
1995	2	0	1	1	1[a]	**5**
1996	2	0	1	0	0	**3**
1997	6	1	0	1	0	**8**
1998	4	0	0	1	0	**5**
1999	4	2	0	1	0	**7**
2000	1	1	0	0	0	**2**
2001	0	1[b]	0	1	0	**2**
2002	3	0	0	0	0	**3**
2003	2	0	0	0	0	**2**
2004	5	0	1	0	0	**6**
Total	**36**	**6**	**3**	**5**	**1**	**51**

Source: GAO analysis of Coast Guard data.

[a]Asphalt.

[b]Jet fuel.

The Coast Guard's data shows that the greatest number (26 of the 51) spills occurred in the Detroit River. Most of the oil spills investigated by the Coast Guard were in the Detroit and Rouge Rivers. Similarly, most of the chemical spills that the Coast Guard investigated were in the Detroit River, while most of the gasoline spills were in Lake St. Clair.

Table 5: Coast Guard Spill Data by Water Body and Material

Water body	Oils	Gasoline and fuels	Coal tar	Chemicals	Other	Total
St. Clair River	3	0	0	0	0	**3**
Lake St. Clair	4	5[a]	0	1	0	**10**
Rouge River	10	0	0	0	1[b]	**11**
Detroit River	18	1	3	4		**26**
Not identified in data set	1	0	0	0	0	**1**
Total[c]	**36**	**6**	**3**	**5**	**1**	**51**

Source: GAO analysis of Coast Guard data.

[a]One of which was jet fuel.

[b]Asphalt.

[c]One spill incident did not have a water body listed.

Michigan DEQ Spill Data

Michigan DEQ officials update their spill data after investigations are conducted, but some data fields (e.g., quantity of material released) are not completed because the information is unknown. There are 21 spill incidents in the Michigan DEQ spill data set that occurred in the St. Clair River, Lake St. Clair, Detroit River, and Rouge River from 1996 through 2004 that have volumes of greater than 50 gallons (or of an unknown volume). Michigan DEQ did not provide spills prior to 1996 because that is when they began collecting spill data electronically.

Table 6: Michigan DEQ Spill Data by Year and Material

Year	Chemicals	Oils	Wastewater	Gasoline and fuels	Tars	Other	Total
1996	0	0	0	0	1	0	**0**
1997	0	0	0	0	0	0	**0**
1998	0	0	1	0	0	1	**2**
1999	0	0	0	0	0	1	**1**
2000	1	0	0	0	0	1	**2**
2001	1	1	1	1	0	0	**4**
2002	1	4	0	0	0	1	**6**
2003	0	0	1	0	0	1	**2**
2004	1	0	1	1	1	0	**4**
Total	**4**	**5**	**4**	**2**	**2**	**4**	**21**

Source: GAO analysis of Michigan DEQ data.

[a]Spills in the chemicals category consist of sodium bisulfate (1), bromine (1), hydro fluranosilic acid (1), and sodium hydroxide (1).

[b]Spills in the oils category consist of non-PCB oil (1) and oils (4).

[c]Spills in the wastewater category consist of untreated wastewater (1), phosphorus wastewater (1), contact wastewater (1), and untreated process wastewater (1).

[d]Spills in the gasoline and fuels category consist of diesel (2).

[e]Spills in the tars category consist of coal tars (2).

[f]Spills in the other category consist of brine (2), paper coatings (1), and clay coatings (1).

Table 7: Michigan DEQ Spill Data by Water Body

Year	Detroit River	Rouge River	St. Clair River	Total
1996	1	0	0	**1**
1997	0	0	0	**0**
1998	0	0	2	**2**
1999	0	0	1	**1**
2000	1	0	1	**2**
2001	2	0	2	**4**
2002	2	2	1	**5**
2003	1	0	1	**2**
2004	3	0	1	**4**
Total	**10**	**2**	**9**	**21**

Source: GAO analysis of Michigan DEQ data.

Ontario SAC Spill Data

Ontario Ministry of Environment officials update spill data to reflect additional information obtained. However, not all data fields are completed because information such as spill quantities and materials are not always known. There are a total of 157 spill incidents in the SAC data that occurred in the St. Clair River (105), Lake St. Clair (5), and the Detroit River (47) between 1994 and 2004 that have volumes greater than 50 gallons (or of an unknown volume). About 9 percent of the 157 have unknown responsible parties, and 127 of the 157 have unknown volumes or masses.

Table 8: Ontario SAC Spill Data by Year and Material

Year	Chemicals[a]	Oils[b]	Wastewater[c]	Gasoline and fuels[d]	Unknown[e]	Other[f]	Total
1994	8	1	11	0	3	3	**26**
1995	6	3	2	0	1	2	**14**
1996	5	1	8	2	0	2	**18**
1997	10	2	2	1	0	2	**17**
1998	3	1	5	1	1	0	**11**
1999	4	1	0	3	2	2	**12**
2000	4	4	2	0	2	0	**12**
2001	0	0	1	0	1	1	**3**
2002	0	0	4	1	0	1	**6**
2003	0	2	1	0	10	2	**15**

Year	Chemicals[a]	Oils[b]	Wastewater[c]	Gasoline and fuels[d]	Unknown[e]	Other[f]	Total
2004	10	0	3	1	7	2	**23**
Total	**50**	**15**	**39**	**9**	**27**	**17**	**157**

Source: GAO analysis of Ontario SAC data.

[a]Spills in the chemicals category consist of acetonitrile, ammonia, benzene, butylene, cyclohexane, divinylbenzene, epoxy, ethylene, ethyl hexyl nitrate, ethyl benzene, ferric chloride, iron, metabisulphate, methylene chloride, methyl ethyl ketone, n-hexane, propylene dichloride, rust inhibitor, sodium chloride, styrene monomer, toluene, vcm, and xylene.

[b]Spills in the oils category consist of heating oil, oily material, transformer oil, petroleum oil, vegetable oil, and waste oil.

[c]Spills in the wastewater category consist of ash and water, chlorinated water, contaminated water, wastewater, wastewater with aromatics, wastewater with chlorides, wastewater with hydrocarbons, process water, effluent water, and water.

[d]Spills in the gasoline and fuels category consist of diesel fuel, fuel, and gasoline.

[e]Spills in the unknown category consist of unknown, not applicable, and blank fields.

[f]Spills in the other category consist of asphalt, brine, cement, concrete, cooling water, foam, plastic material, sand and gravel, sediment, silt, and suspended solids.

Table 9: Ontario SAC Spill Data by Water Body

Year	Detroit River	Lake St. Clair	St. Clair River	Total
1994	5	0	21	**26**
1995	4	0	10	**14**
1996	3	1	14	**18**
1997	6	0	11	**17**
1998	2	0	9	**11**
1999	6	0	6	**12**
2000	6	0	6	**12**
2001	1	0	2	**3**
2002	3	1	2	**6**
2003	7	1	7	**15**
2004	4	2	17	**23**
Total	**47**	**5**	**105**	**157**

Source: GAO analysis of Ontario SAC data.

Appendix III: CSO Data for the St. Clair–Detroit River Corridor, 1999–2004

Michigan DEQ's CSO data were available as of 1999, when Michigan DEQ began tracking sewer overflows. The CSO data, like spill data, have a data-reliability limitation relating to uncertainty as to whether all CSO events are reported; however, spills may be particularly subject to underreporting because they are not part of a structured program as CSOs and industrial permit violations are. CSO data provide additional information in terms of the amount and location of pollutant discharges into the waters of the corridor. According to EPA, CSOs contain storm water, untreated human and industrial waste, toxic materials, and debris. The roughly 1,400 CSOs that were greater than 50 gallons (or of an unknown volume) greatly exceeded the number of spills that met these criteria during the 6-year period. The largest category of CSOs was of diluted raw sewage. The Rouge and Detroit Rivers received most of the CSOs, with 1,296 incidents.

Table 10: CSOs in the St. Clair–Detroit River Corridor from 1999–2004 by Water Body

Water body	Fully treated	Treated to NPDES limit	Diluted raw sewage	Partially treated sewage	Raw sewage	Not specified	No information	Total
Detroit River	0	39	316	154	1	84	0	**594**
Rouge River	0	0	508	98	17	78	1	**702**
St. Clair River	0	0	91	0	0	38	0	**129**
Lake St. Clair	0	0	6	16	9	22	0	**53**
Total	**0**	**39**	**921**	**268**	**27**	**222**	**1**	**1,478**

Source: GAO analysis of Michigan DEQ data.

CSOs accounted for over 900,000 million gallons of partially treated sewage discharged into waters of the corridor.

Table 11: Volume of CSOs in the St. Clair–Detroit River Corridor from 1999–2004 (in Millions of Gallons)

Water body	Volume of diluted raw sewage	Volume of raw sewage	Volume of partially treated sewage	Total
Detroit River	4,741	1,718	26,588	**33,047**
Rouge River	3,254	50	885,846	**889,149**
St. Clair River	233	0	0	**233**
Lake St. Clair	526	437	525	**1,488**
Total	**8,753**	**2,205**	**912,959**	**923,917**

Source: GAO analysis of Michigan DEQ data.

Appendix IV: NPDES Industrial Effluent Violation Data for the St. Clair–Detroit River Corridor, 1994–2004

The National Pollutant Discharge Elimination System (NPDES) requires industrial and municipal facilities to obtain permits to discharge pollutants into U.S. waters. Such permits establish required effluent limitations or best management practices. The industrial effluent violation data we obtained from EPA rely upon self-reporting by industries, and therefore the data have the same data reliability limitation as spills and CSO data in terms of uncertainty about whether all events are reported. In addition, volumes are not commonly reported with effluent discharge violations as toxicity is a greater concern—and therefore volume data are limited. However, the data provide additional information on pollutant discharges in the corridor. From 1994 through 2004, there were a total of 2,257 NPDES industrial effluent violations in the St. Clair River, Lake St. Clair, Detroit River, and Rouge River. Of these violations, 1,871 (or about 83 percent) of the total had volumes of greater than 50 gallons (or of an unknown volume). The two largest NPDES discharge violations, in terms of volume, related to oil and grease—and these were discharged by the same facility in 1994 only a few months apart. The most frequently discharged materials were solid pollutants, pH-altering materials, oil and grease, and materials that had the potential to alter oxygen availability in the receiving waters. Solid pollutants include pollutants found in wastewater that were not removed during the treatment process and can cause toxic conditions or contaminate sediment.

From 1994 through 2004 the volume of discharged materials was available for 204 of the 1,871 permit violations. For the remaining 1,667 (or 89 percent) of the violations, the volume was not available.

Table 12: Number of NPDES Industrial Effluent Violations by Volume per Year

Year	Number of NPDES violations	Volume per year if known (in gallons)
1994	271	23,073,813
1995	252	18,157
1996	279	23,707
1997	232	26,911
1998	179	7,492
1999	169	9,376
2000	102	7,934
2001	130	17,769
2002	121	13,133
2003	79	5,647

Year	Number of NPDES violations	Volume per year if known (in gallons)
2004	57	42,085
Total	**1,871**	**23,246,024**

Source: GAO analysis of EPA data.

Over 50 percent of the materials discharged by industries in violation of their permits were solid pollutants, oil and grease, zinc, or materials that alter the pH or oxygen available in the receiving waters into which they were discharged.

Table 13: Number of NPDES Industrial Effluent Violations by Discharged Material and Year

Year	Solid pollutants	pH	Oil and grease	Carbonaceous 05 day, 20c BOD	Zinc, total (as ZN)	Other materials	Total
1994	37	44	37	21	30	102	**271**
1995	54	39	11	23	12	113	**252**
1996	48	34	23	18	15	141	**279**
1997	46	29	9	10	19	119	**232**
1998	47	31	4	13	5	79	**179**
1999	30	33	16	9	7	74	**169**
2000	30	12	4	2	0	54	**102**
2001	30	25	15	3	2	55	**130**
2002	34	8	15	3	5	56	**121**
2003	11	11	7	10	7	33	**79**
2004	12	9	6	7	1	22	**57**
Total	**379**	**275**	**147**	**119**	**103**	**848**	**1,871**

Source: GAO analysis of EPA data.

Over 52 percent of the NPDES violations occurred at 12 facilities, and 1 facility had 176 violations during the 11-year time frame.

Table 14: Number of NPDES Industrial Effluent Violations by Water Body and Material for the 12 Most Frequently Violated Permits

Facility name	Facility types	Materials discharged	Receiving water location	Years	Number of violations
Detroit Metro Wayne County Airport	Airports, flying fields, and service	Phosphorus, pH, oxygen dissolved, oil and grease, nitrogen ammonia, lagoon freeboard, carbonaceous biological oxygen demand	Frank & Poet Drain/Sexton Kilter-(Detroit River)	1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004	176
DSC– Trenton plant	Blast furnace and steel works	Zinc, total suspended solids, total recoverable phenolics, pH, oil and grease, lead, free cyanide, cyanide total	Trenton Channel–Detroit River	1994, 1995, 1996, 1997, 1998	131
Chrysler-Chelsea proving grounds	Commercial testing laboratory	Total suspended, solids, phosphorus total removal, dissolved oxygen, pH, oil and grease, nitrogen ammonia, carbonaceous biological oxygen demand, coliform fecal material	Mill Creek (Detroit River)	1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004	129
United States Steel–Ecorse	Blast furnace and steel works	Zinc, final toxicity, total suspended solids, pH, oil and grease, copper	Detroit River	1994, 1995, 1996,1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004	113
Mobile Home Park & Marina	Operation of mobile home sites	Total suspended solids, phosphorus total percent, coliform fecal material, chlorine total residual, 5 day biological oxygen demand	Huron River (Detroit River)	1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004	75
Cargill salt division– St. Clair	Chemical and chemical preparation	Total suspended solids, pH, conductivity, chloride	St. Clair River	1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004	63
Selfridge Air National Guard Base	Airport, flying fields, and service	Oil and grease, pH, dissolved oxygen, carbonaceous biological oxygen demand	Clinton River and Lake St. Clair	1994, 1995, 1997, 1999, 2001, 2002, 2003, 2004	57
Arkema Inc.	Industrial inorganic chemicals	Triethylamine, zinc, total suspended solids, pH, diethylamine, carbonaceous biological oxygen demand	Trenton Channel of the Detroit River	1994, 1995, 1996, 1997, 1998, 1999, 2001, 2002, 2003, 2004	56
DSC Ltd.–Gibraltar	Nonclassifiable establishments	Zinc, total suspended solids, oxygen demand sum product, dissolved oxygen, oil and grease, nitrogen ammonia, carbonaceous 5-day biological oxygen demand, lead, pH	Frank & Poet Drain (Detroit River)	1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003	54

Facility name	Facility types	Materials discharged	Receiving water location	Years	Number of violations
Michigan Seamless Tube LLC	Steel pipe and tubes	Vanadium, zinc, final toxicity, total suspended solids, total phosphorus, pH, oil and grease, total cadium	Yerkes Drain (Detroit River)	1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004	52
E.B. Eddy Paper Inc.	Paper mills	Total suspended solids, pH, copper, total residual chlorine, 5 day biological oxygen demand	St. Clair & Black Rivers	1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004	43
Trelleborgysh Inc.–Sandusky	Rubber and plastic hoses and belts	Oil and grease, total residual chlorine, toulene, dichloroethylene, trichloroethylene, pH, toxicity, dissolved oxygen, phosphorus total	Black River via Stone Drain (St. Clair River)	1994, 1995, 1996, 1997, 1999, 2000, 2001, 2002, 2003, 2004	46
Other permit violations					876
Total violations					**1,871**

Source: GAO analysis of EPA data.

Appendix V: Spill Profiles for Six Selected Incidents

U.S. Spill: 2001 Hazardous Substance Spill

- From May 16 at 1:00 p.m. to May 17 at 1:00 p.m., two spills of approximately 14–15 million gallons of storm water mixed with ethylene glycol and propylene glycol (deicing agents) were discharged into a storm sewer leading to the Detroit River.[1] The responsible party claimed that the release was due to blockage in a 10-inch pipe from a holding pond containing the material to the sanitary sewer system.

- Initially, EPA estimated that 10,000 fish were killed due to depletion of dissolved oxygen in the waterway.

- On May 18, the NRC received a spill report from an observer who saw fish dying. NRC reported the spill to EPA, the Coast Guard, and Michigan DEQ shortly after 6:00 p.m. At 6:53 p.m., EPA contacted the Michigan Pollution Emergency Alerting System (PEAS) hotline. At 8:00 p.m., the PEAS operator contacted Michigan DEQ Water Bureau staff. At 9:00 p.m., the EPA on-scene coordinator notified the Michigan DEQ and the Coast Guard. When the Michigan DEQ spill responder did not arrive on-scene, the PEAS operator called the Michigan DEQ District Supervisor at 11:30 p.m. On May 19 at 12:15 a.m., the Michigan DEQ District Supervisor contacted a spill responder, saying that EPA had been on the scene and was requesting Michigan DEQ representation. At 8:00 a.m. on May 19, DEQ staff arrived at the scene. At 10:30 a.m., two Coast Guard responders arrived at the scene.

- At 5:00 p.m. on May 20, tanker trucks flushed out an isolated section of the affected sewer drain with clean water. A pump was installed to pump water to the nearby wastewater treatment facility. This lasted until 10:00 a.m. on May 21.

- The responsible party notified Michigan DEQ of the May 16 and 17 discharges on May 22.

- The facility that is responsible for these discharges has an industrial NPDES permit. Michigan DEQ agreed to accept best management practices instead of numeric pollutant limits for the summer discharges from this facility. So from May through September, the facility's permit had no limitations on oxygen-depleting materials. Michigan DEQ's understanding was that all discharges containing high amounts of oxygen-depleting materials would be directed to the sanitary sewer, for further treatment at the wastewater treatment facility.

[1]Volume estimate provided by the responsible party.

U.S. Spill: 2002 Oil Spill

Figure 11: 2002 Rouge River Oil Spill

Source: U.S. Coast Guard.

- On April 9, at 9:50 a.m., an observer notified the Coast Guard's Detroit Marine Safety Office of an oil spill near their property. At 10:00 a.m., the Coast Guard received a spill report from a nearby bridge operator. At 10:01 a.m., the Coast Guard notified the NRC. At approximately 11:00 a.m., the

Coast Guard arrived on the scene. At 1:00 p.m., the Coast Guard briefed Michigan DEQ. At 2:05 p.m., the Coast Guard notified EPA.

- On April 10, at 9:20 a.m., the Coast Guard and EPA discussed the spill via phone. At 11:00 a.m., EPA and a contractor arrived at Dearborn, MI, to begin emergency assessment activities. Also at 11:00 a.m., the Coast Guard issued a warning message to Canadian officials. At 1:44 p.m., the Coast Guard began contacting Michigan drinking water facilities. At 7:55 p.m., the U.S. and Canadian Coast Guards agreed to invoke the Joint Marine Pollution Contingency Plan.

- On April 12, another spill occurred in the Rouge River.

- According to the National Oceanic and Atmospheric Administration's Scientific Support Coordinator's report, the spill material was weathered diesel mixed with used synthetic lube oil (such as "3 in 1 oil"), mixed with sewage.

- A Coast Guard summary from April 26 indicates 66,359 gallons of oil were recovered. An EPA spill summary indicates that multiple agencies recovered 63,000 gallons of oily water from open water and shorelines and more than 771,564 gallons of oil, oily water, and oily sludge from the municipal sewers of Dearborn and Detroit. EPA's final estimate for total spill volume was 321,000 gallons of oil.

- The responsible party did not report the spills nor could officials identify the party.

- A Coast Guard report from July 1 says that $3,989,905 was expended for response. Coast Guard officials from the Detroit marine safety office noted that there is not a funding mechanism for response when the spill originates on one side of the international boundary and damage occurs on the other. A Canadian report notes that $1,131,550 in Canadian dollars was spent on spill response.

- EPA's cost of cleanup and response was about $2.5 million. An EPA report says that the Coast Guard, EPA, and responding city governments spent approximately $10 million on spill response and investigation.

- According to the Fish and Wildlife Service (FWS), 17 miles of U.S. shoreline were affected and 16 kilometers (10 miles) of Canadian shoreline were impacted. Two of the islands with shorelines that were oiled were part of the newly created Detroit River International Wildlife Refuge.

- Over 100 birds and reptiles were reported as dead, rehabilitated, or observed oiled or otherwise impacted. A FWS representative believes this number significantly underestimates the numbers impacted. She believes a multiplier should be used, and estimated the actual number of birds and reptiles impacted at approximately 720 to 900.
- Per the Coast Guard documents, the Captain of the Port closed the Rouge River temporarily. Six vessel transits were delayed, one cancelled, and two diverted to other ports as a result of the incident. Two companies expressed concerns about staying open if Rouge River closure extended past April 18. Some recreational boats and marinas were oiled.
- On the Canadian side of the corridor, a drinking water intake advisory was in effect on April 11.

U.S. Spill: 2004 Oil Spill

Figure 12: 2004 Rouge River Oil Spill

Source: U.S.Coast Guard.

- On August 3, at 7:00 a.m., a bridge operator notified the Coast Guard's Detroit marine safety office of an oil sheen in the Rouge River. At 8:00 a.m., the Coast Guard dispatched pollution investigators to the scene. At 9:07 a.m., the Coast Guard notified Michigan DEQ. At 9:20 a.m., the Coast Guard notified the Ontario SAC. At 9:27 a.m., the Coast Guard notified EPA. At 9:30 a.m., the Coast Guard notified the NRC.

- At 10:05 a.m., a Coast Guard contractor started containment efforts. The contractor diverted oil to a collection point and boomed the north side of the Rouge River. Vacuum trucks and skimmers recovered oil on the southern side of the Rouge River. At 11:30 a.m., the contractor deployed an additional boom at the mouth of the Rouge River to collect any oil that escaped.

- At 11:40 a.m., the Detroit Water and Sewage Department confirmed multiple CSO discharges into the Rouge River, the last of which ended at 9:55 a.m. At 2:10 p.m., the Coast Guard's District 9 reported that Canadian authorities reported oil and debris on their side of the Detroit River in the vicinity of Fighting Island, and it was consistent with a CSO release. At 3:24 p.m., the NRC notified the Coast Guard and Michigan DEQ of spill details provided by the Canadian Coast Guard. The Canadian Coast Guard indicated that the Joint Marine Pollution Contingency Plan was invoked. At 5:56 p.m., the NRC notified the Coast Guard and Michigan DEQ of spill details provided by an observer who stated that a black slick was seen coming from a freighter which recently took on a load of salt. At 6:03 p.m., the NRC notified the Coast Guard and Michigan DEQ of spill details provided by a power plant regarding a sheen coming into the plant's inlet canal. On August 4, the NRC notified the Coast Guard and Michigan DEQ of an oil sheen reported again by the power plant.

- The spill material was an oil and sewage mixture. The Coast Guard originally estimated that the spill was 100 gallons, however in their database it is listed as a 2,000-gallon spill. The Coast Guard's final estimate was 5,000 gallons.

- The responsible party did not report the spills, nor could officials identify the party.

- EPA officials stated that officials from the City of Dearborn, the City of Detroit, Michigan DEQ, EPA, and the Coast Guard inspected CSO structures to the Rouge River in the area of concern, and no evidence of oil accumulation was found in any of the sewers.

- On August 3, a project cost ceiling was set at $25,000. This was raised on August 4 to $75,000. On August 6, the ceiling was raised from $110,000 to $195,000.
- On August 28, another oil spill occurred in the Rouge River. An EPA report indicates that the individual identifying the spill stated that CSOs containing oil had been occurring for 15 months intermittently.
- The City of Detroit was held responsible for the August 3 and August 28 spills, and ultimately paid approximately $249,000 for response efforts.

Canadian Spill: 2003 Hazardous Substance Spill

- On August 14, at approximately 4:45 p.m., 34 gallons of vinyl chloride monomer were discharged into the St. Clair River.[2] The spill lasted for almost 12 hours. On the following day, another spill of 5 gallons of this substance was discharged into the river. The cause of the spill was a cracked tube in a cooling water system heat exchanger. The responsible party did not report the spill to the Ontario SAC until August 19, because an electrical blackout caused monitoring equipment to be inoperable.
- Ontario Ministry of Environment staff implemented procedures to warn downstream intakes and take samples. All samples at Canadian reservoirs came back negative. In addition, the Ministry of Environment ran models to determine potential impacts. Ministry of Environment officials did not issue an advisory, but Chatham Health Unit did issue a bottled-water advisory for Wallaceburg municipal supply consumers.
- Models run by the Ministry of Environment showed that vinyl chloride levels would be below the drinking water standards (2 parts per billion).
- There are 12 intakes serving Michigan public water systems in the St. Clair watershed between Port Huron and Detroit. Michigan DEQ scientists reviewed the incident and determined that the amount of vinyl chloride lost, based on a spill of 650 lbs., would not have resulted in concentrations at Michigan drinking water plant intakes exceeding the maximum contaminant level and that no human health risks resulted from the event. No sampling of Michigan drinking water plant intakes was conducted upon notification of the incident because data collected would not have been useful due to the rapid flow rate of the river at the time of the event.

[2]Volume estimate was provided by the responsible party. Vinyl chloride is a potential human carcinogen when inhaled, and it has been shown to cause liver cancer in laboratory animals exposed orally or by inhalation.

Canadian Spill: 2004 Hazardous Substance Spill

- On February 1, from 3:00 to 4:20 a.m., an estimated 39,626 gallons of methyl ethyl ketone and methyl isobutyl ketone were discharged into the St. Clair River.
- At 5:31 a.m., the responsible party reported to the Ontario SAC that they had identified a leaking heat exchanger at the lube plant, which resulted in contamination of their cooling water. At 6:40 a.m., SAC staff briefed the Michigan State Police on the incident. At 7:22 a.m., the Michigan DEQ's Pollution Emergency Communications Coordinator contacted the relevant Michigan DEQ staff. Michigan DEQ staff contacted the SAC for more information at 7:45 a.m. Michigan DEQ then notified Michigan drinking water facilities between 8:00 and 9:00 a.m. After 11:00 a.m., the Michigan DEQ made a decision to recommend that drinking water facilities shut their intakes. Drinking water facilities in Port Huron, Marysville, St. Clair, East China Township, Marine City, Algonac, Ira Township, New Baltimore, Mt. Clemens, Grosse Pointe Farms, Highland Park, and Wyandotte were advised of the situation and all plants except Port Huron, the Detroit plants, and Wyandotte were asked to shut down by Michigan DEQ.
- The spill caused more than a dozen water plants on either side of the river to close their intakes. About 36,000 customers in the St. Clair and Macomb County communities of Marysville, St. Clair, East China Township, Marine City, Algonac, and Ira Township were adversely impacted by the intake closures.

Canadian Spill: 2004 Oil Spill

- On May 23, at 4:10 a.m. and 6:00 a.m., an unknown number of gallons of oily water were discharged into the St. Clair River. Heavy rains caused three oil separators to overflow.
- At 6:05 a.m., the responsible party reported the spills to the Ontario SAC. The responsible party began sampling and told Ontario officials that there were no visible signs of oil or contaminants. At 7:40 a.m., the Ontario SAC notified Michigan officials through the PEAS hotline. From 8:30 to 9:30 a.m., a Michigan DEQ official notified Michigan drinking water facilities.

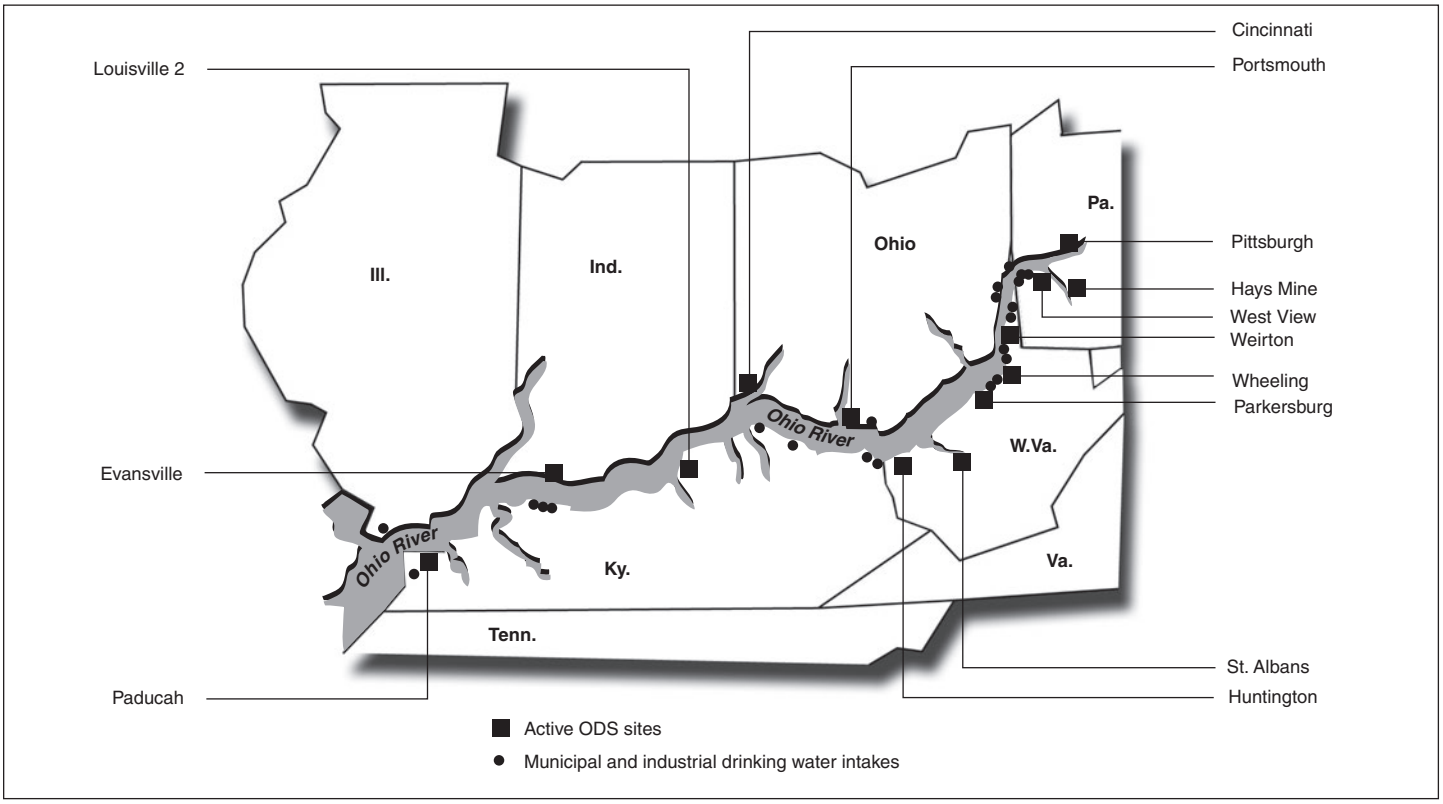
Appendix VI: ORSANCO Spill Detection and Notification System

The Ohio River Valley Sanitation Commission (ORSANCO) was established in 1948 in order to control and abate pollution in the Ohio River Basin. ORSANCO is an interstate commission representing eight states and the federal government. Member states include Illinois, Indiana, Kentucky, New York, Ohio, Pennsylvania, Virginia, and West Virginia. ORSANCO has programs to improve water quality in the Ohio River and its tributaries. Their tasks include setting wastewater discharge standards, performing biological assessments, monitoring the chemical and physical properties of the waterways, and conducting special surveys and studies. In addition, ORSANCO coordinates emergency response activities for spills or accidental discharges to the river and coordinates public participation in programs.

In 1977, an unreported discharge of hazardous chemicals contaminated drinking water facilities in the corridor. Due to the lack of a coordinated monitoring system, misinformation was distributed to the public, causing concern for the safety of the drinking water. This incident demonstrated the vulnerability of the Ohio River water intakes to spills and led to the development of the Organics Detection System. ORSANCO, in conjunction with drinking water utilities, identified strategic locations along the river where monitoring for chemicals would be most beneficial and protective of drinking water intakes. ORSANCO suggested that water facilities located at strategic points along the river could perform routine monitoring for oil and hazardous chemical discharges. ORSANCO proposed that they serve as technical coordinator and information clearinghouse, providing statewide communications in the event of a spill.

Currently, ORSANCO maintains an inventory of water intakes, wastewater discharges, and material transfers on the Ohio River. Also, a time-of-travel model is used to estimate the arrival time of contaminant discharges during spill events. The results of the model have been used to identify the locations of the Organics Detection System. The Organics Detection System was established in 1978 and participants include 11 water utilities, one chemical manufacturer, and one power generating facility. Data from each facility is to be downloaded for review and evaluation on a weekly basis. Each instrument can detect and quantify twenty-two organic compounds. The list of compounds represents the organic chemicals of greatest concern to water utilities and most likely to be detected based on an inventory of chemicals stored, transported, and manufactured along the Ohio River.

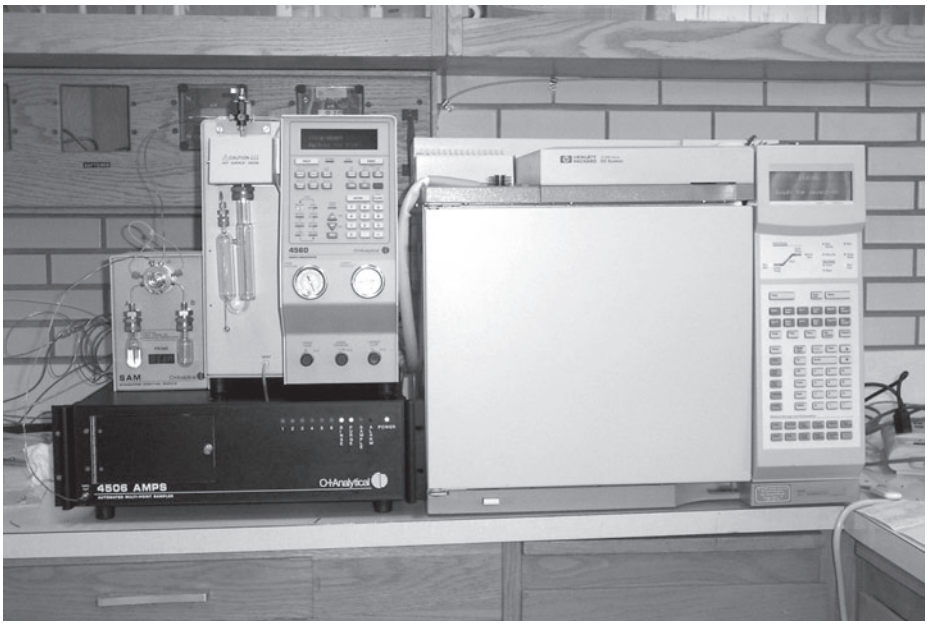
Figure 13: ORSANCO Organics Detection System Monitoring Sites



Source: ORSANCO.

Facility operators are required to notify ORSANCO when detection of a compound over a specified threshold is observed or when an unidentified compound is detected. When this occurs, plant operating personnel are notified of the contaminant so treatment techniques to remove the compound can be implemented. ORSANCO notifies downstream water utilities and state and federal water quality and emergency response agencies, including the NRC.

Figure 14: Water Quality Monitoring Equipment Used at ORSANCO Sites



Source: ORSANCO.

Appendix VII: Comments from the Department of Homeland Security

U.S. Department of Homeland Security
Washington, DC 20528

Homeland Security

May 11, 2006

Mr. John B. Stephenson
Director
National Resources and Environment
U.S. Government Accountability Office
441 G Street, NW
Washington, DC 20548

Dear Mr. Stephenson:

Thank you for the opportunity to review and comment on the Government Accountability Office's (GAO's) draft report entitled *CLEAN WATER: Better Information and Targeted Prevention Efforts Could Enhance Spill Management in the St. Clair-Detroit River Corridor* (GAO-06-639).

Overall, the report seems to present an accurate description of the United States Coast Guard's processes for polluting incident enforcement and investigation, and the associated management information. However, a few clarifications are needed, as described below.

Documentation of spill amounts:

The last paragraph on page 4, under "Results in Brief", states in part:

> ". . . In contrast, the Coast Guard District Nine officials document their investigations and use the information to update their spill data, but they do not update spill volume estimates after investigations because of automated system limitations that do not allow them to input revised estimates. . ."

This statement, which is repeated in several locations throughout the report, may result from confusion about different data sources.

For the period of the GAO report, the Coast Guard recorded the results of spill investigations in a system known as "Marine Information for Safety and Law Enforcement" (MISLE) and the predecessor to MISLE, known as the "Marine Safety Information System" (MSIS). In both MISLE and MSIS, investigators had full control over the details of all pollutant information in the incident reports. This includes

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substance identification and the amounts spilled into and out of the water. The pollutant information could be revised at any point until the reports were closed and submitted for review. Further, if there was a reason to revise a report it could be returned to the investigators.

The example cited by GAO on page 14 is the result of a combination of extremely rare circumstances, due in part to the Coast Guard's transition from MSIS to MISLE. The example reads as follows:

> ". . .For example, a spill listed in Coast Guard's dataset as being a 2,000 gallon spill is also reported in Coast Guard's annual report as being over 8 million gallons. . ."

The incident in question occurred in May of 2001, with an initial spill estimate of 2,000 gallons. Investigators entered the data into MSIS, which was still in operation at that time. As noted above, the investigators had full control of the report, including spill amounts. On 25 June 2001 the investigator who initiated the report closed it, indicating that the investigation was complete. It appears that, at some point later, the spill estimate was increased to 8.4 million gallons. However, it was only possible to reopen and revise the MSIS report until 12 December 2001, when MSIS was shut down and replaced by MISLE. At that point, all MSIS investigations were copied into MISLE. A backup copy of the MSIS data remains on a Coast Guard server, for reference purposes and cannot be updated. The MISLE copy of all spill reports can be reopened and revised at any time, if requested by the investigators. It should also be noted that the revised spill estimates do not appear anywhere in the original MSIS report. Thus, normal quality control procedures would not have detected the error. Further, the "Coast Guard's annual report" noted by GAO was a local publication that was not under the purview of Coast Guard Headquarters and not used for nationwide reports or studies.

Consequently, the example given in the GAO report does not fairly represent the true nature of the Coast Guard's polluting incident databases or the procedures used to collect and record the data. In fact, incident investigations in the MISLE system contain an extensive set of business rules and edit-checks. Like any information system, however, certain types of errors are possible. For example, it is possible that an investigator can include a spill amount in the narrative portions of a report that is different from the numeric values included in the applicable data slots. Again, both MSIS and MISLE systems gave investigators, who are responsible for correcting any inconsistencies, full control of their reports.

After pollution investigations are completed, they are transferred electronically to Coast Guard Headquarters, where additional reviews are performed. When errors are detected, they are either corrected on the spot, if the correct information is obvious, or the report is returned to the investigating unit for correction. Given the number of built-in and human edit checks that are applied to spill reports, the Coast Guard believes that reported spill volumes are sufficiently accurate for use by decisionmakers at all levels of the Federal government.

Penalties for Failure to report a spill:

The second paragraph on page 41 states in part:

> "In addition, though EPA and Coast Guard officials acknowledge that spill reporting is not always occurring, the agencies did not elect to penalize responsible parties for failure to report spills in the time period we reviewed."

The Coast Guard believes that additional factors should be considered by the GAO. A review of all incidents that occurred during the study period showed that approximately 30% were mystery spills. Thus, no party was identified for enforcement action. Of the remainder, civil penalty enforcement actions were initiated for the actual spills under the Federal Water Pollution Control Act, Title 33 of the US Code Section 1321(b). There is no civil penalty provision to cite a party specifically for "failure to report a spill." The Captain of the Port, using guidance found in COMDINST M16201.1, Criminal Enforcement of Environmental Law, will evaluate various factors and then consult with the District Commander to make a determination as to whether the nature of the spill warrants criminal investigation and greater sanctions. As found in COMDINST M16201.1, "The Department of Justice makes the final decision on whether, and under what conditions, to prosecute violations of the environmental laws as criminal cases."

While there were no enforcement actions in the small geographic area of the GAO study, nationally the Coast Guard regularly refers cases to the Department of Justice for failure to report oil pollution. Usually, such offenses are part of a larger scheme to illegally dispose of pollutants, including intentional discharges, fraudulent recordkeeping, hidden changes in a vessel's piping systems, etc. A February 2006 Coast Guard study of significant spills stated that: "The Coast Guard and the Department of Justice have successfully prosecuted thirty criminal cases between 1995 and 2005 involving the intentional discharge of oil, (and) twenty-one since 2002." Thus, such prosecutions have been on the increase in recent years. In fact, other enforcement actions are ongoing with the most recent conviction on May 4th, against the operating company and chief engineer of the M/V TEXAS TREASURE. Among the sanctions in that case, the operating company was ordered to pay a $300,000 penalty.

For the period of the study, there were only 5 chemical spills where a Comprehensive Environmental Response, Compensation, and Liability Act penalty for failure to report a spill might apply. Of those, all but one was reported by the responsible party, as required. The remaining incident, reportedly involving 8 million gallons of ethylene glycol and described above, was under the jurisdiction of the Environmental Protection Agency for enforcement purposes.

Thus, the Coast Guard's enforcement actions should be considered appropriate for the circumstances of each incident.

Thank you again for the opportunity to comment on this draft report and we look forward to working with you on future homeland security issues.

Sincerely,

Steven J. Pecinovsky
Director
Departmental GAO/OIG Liaison Office

Appendix VIII: GAO Contact and Staff Acknowledgments

GAO Contact

John B. Stephenson (202) 512-3841

Staff Acknowledgments

In addition to the individual named above, Kevin Bray, John Delicath, Michele Fejfar, Jill Roth Edelson, Katheryn Summers Hubbell, Jamie Meuwissen, and John Wanska made key contributions to this report.

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