

3.08—Environet

BACKGROUND

The Ministry of the Environment has a broad mandate to restore, protect, and enhance Ontario's environment to ensure public health and environmental and economic vitality. It works to ensure cleaner air, water, and land through many Acts and associated regulations, which include the *Ontario Water Resources Act*, the *Environmental Assessment Act*, and the *Environmental Protection Act*.

In 2000, the Ministry developed a new information technology vision and strategy called Environet to strengthen the delivery of its environmental programs. The Environet envisages and provides for individual management information systems to collect and report data that ministry management and staff need to enhance their inspection and other compliance work. The systems being developed as part of the Environet strategy include:

- a Drinking Water Information System (DWIS) incorporating electronic submission of water quality test results from laboratories that analyze water samples from Ontario's waterworks facilities;
- a Hazardous Waste Information Network (HWIN) to replace the legacy system, Hazardous Waste Information System (HWIS), for tracking hazardous waste movements throughout the province;
- an Air Emission Registry (OnAir) that receives emission reports electronically from facilities emitting airborne contaminants and posts this information on a public Web site; and
- a Computer Assisted Mobile Enforcement Office (CAMEO) system that provides a SWAT inspection group with the ability to access and maintain inspection information while in the field.

At the time of our audit the Ministry had spent approximately \$17.1 million developing these applications.

The Environet is a long-term strategy and as such is being designed to ensure flexibility in response to future legislative and regulatory changes. Several of its planned components have yet to be finalized. Through the use of the Environet systems—along with strong deterrents and aggressive inspection and enforcement activities—the Ministry plans to strengthen its environmental analysis and reporting capabilities, improve industry

compliance with its regulations, and fulfill the government's future environmental commitments.

AUDIT OBJECTIVES AND SCOPE

The objectives of our audit of the Environet were to assess whether the Ministry had adequate policies and procedures in place to:

- ensure that Environet systems adequately addressed existing legislative and regulatory requirements; and
- ensure that the Environet systems are being developed in accordance with government and IT best practices and the government's environmental commitments for which the Ministry is responsible.

At the beginning of our audit, we identified audit criteria that would be used to address our audit objectives. These were reviewed and accepted by senior ministry management.

Our audit was substantially completed by the end of March 2003. The scope of our audit included discussions with ministry staff and a review and analysis of relevant policies, procedures, and related documents on the four major Environet applications listed earlier.

As part of our audit, we used a number of Computer Assisted Audit Techniques (CAATs) to extract and analyze ministry and industry data housed in the databases supporting each system. Given the importance of the Ministry's inspection activities in ensuring compliance with environmental regulations, we reviewed the use of the Environet systems by inspectors and followed up on a number of inspection issues made in prior audit reports.

We did not rely on the Ministry's internal auditors to reduce the extent of our work because they had not conducted any recent work in the areas covered by the audit.

Our audit was performed in accordance with the standards for assurance engagements, encompassing value for money and compliance, established by the Canadian Institute of Chartered Accountants. Accordingly, it included such tests and other procedures that we considered necessary in the circumstances.

OVERALL AUDIT CONCLUSIONS

We concluded that, at the time of our audit, the Ministry's Environet systems did not provide ministry staff with the information needed to support the Ministry's responsibilities of ensuring that drinking water meets regulatory standards, that hazardous waste movements are properly controlled, and that all air emissions are monitored and reported where required. We further noted that the Environet systems do not, as yet, enable the Ministry to summarize and analyze regulatory compliance and to maximize inspection efforts by identifying areas of highest risk. The Ministry continues to rely on legacy systems

and manual procedures in some instances. More effort will also be needed to ensure Environet systems adequately support all the Ontario government's environmental commitments. Our major findings were:

- The Drinking Water Information System (DWIS) did not identify whether all waterworks were submitting their required sample test results. We noted that 300 of the 1,476 currently registered non-municipal waterworks have never submitted any test results to the Ministry. The Ministry is still following up on 237 of these facilities. Furthermore, 612 or approximately 27% of registered waterworks had not submitted the minimum number of water samples for two of the highest-risk substances, *E. coli* bacteria and fecal coliform.
- Many waterworks continue to experience compliance difficulties including exceedances, which are water samples with unacceptably high concentration levels of regulated substances. Although exceedances represent less than 1% of total samples taken, our data-extraction work did identify 6,725 exceedances since 2001. Of these, 3,181 were identified as Adverse Water Quality Incidents (AWQI), which are more serious exceedances that affect human health.
- The ministry systems and procedures did not ensure all AWQI were reported and followed up on. For example, the Ministry was not aware of 31 out of 46 AWQI at one waterworks. Moreover, summary reports did not distinguish the more serious AWQI from other exceedances, or raw-water samples from treated-water samples. Such reports were therefore of little value in ensuring that the highest-risk cases were prioritized for investigation. Furthermore, the system did not report on whether problem incidents were resolved.
- A new tracking system to accept electronic transaction submissions from hazardous waste generators, carriers, and receivers was being used for less than 1% of hazardous waste movements. The older, inefficient, paper-manifest system was still being used to handle almost all transactions because the new system could not accept paper submissions. The new system also had few analysis and reporting capabilities. Although we noted that over 5,000 unauthorized hazardous waste movements (which represent less than 3% of total movements) were flagged by the system, we found no evidence of any follow-up action to investigate and resolve them.
- The new CAMEO application was working well. For example, its mobile capability allowed the SWAT team to access ministry data at inspection sites, thus increasing efficiency.
- Although the Ministry has recently increased the number of inspectors, total inspection activity is currently at 73% of 1995/96 levels and inspectors are averaging fewer inspections annually. We were informed that this was due to the increased length of time it now takes to conduct inspections. Given the significant increase in the number of facilities that are now covered by new regulations, the Ministry needs to develop a strategy to deal with these new regulated facilities. For example, last year water inspectors

visited only 54 of the 357 private, drinking water treatment plants and 44 of the 1,119 smaller plants and designated facilities.

Overall Ministry Response

The Provincial Auditor's Report is consistent with ongoing ministry initiatives to increase the effectiveness of our Environet systems. The Ministry recognizes that its ability to engage in effective inspection, investigation, and enforcement activities in all areas of its responsibility—air, water, land—can be enhanced by information technology. Over time, the Ministry has developed multiple systems, usually on a program-by-program basis, to assist staff by providing more effective and efficient data collection, analysis, and reporting.

Recognizing that an integrated strategy for managing information could prove even more useful, the Ministry adopted the Environet information technology strategy in 2000. The Environet strategy was designed to provide the Ministry with more effective day-to-day information with which to manage current programs.

Since Environet is a long-term strategy, the Ministry is moving forward on a timetable that allows for adequate development and testing of new systems and a smooth transition from old systems to new.

DETAILED AUDIT OBSERVATIONS

DRINKING WATER

There are more than 1,100 large waterworks facilities in the province that provide drinking water for Ontario residents. Municipalities own and operate over 700 of these facilities, which service approximately 80% of Ontario households. In addition to these large facilities, approximately 1,100 smaller private waterworks provide drinking water to many rural areas and to a number of institutions, including schools, day nurseries, social and health care facilities, and trailer parks.

As a result of the May 2000 tragedy in Walkerton that claimed seven lives and caused more than 2,300 people to become ill, the Ontario government in August 2000 launched Operation Clean Water—an action plan designed to ensure that Ontario residents have the safest drinking water in Canada. The cornerstone of this plan was a new Drinking Water Protection Regulation under the *Ontario Water Resources Act*. Covering all municipal and large waterworks systems, the regulation set out revised minimum sampling, analysis, and reporting standards for each facility. As well, the Ministry adopted a new policy of inspecting all municipal waterworks annually. In its first report on municipal facility inspections under the new program, inspectors noted that of the 558 facilities visited, 275

or 49% failed to conform to established standards and 24% were repeat offenders. Two hundred correction orders were issued.

In December 2001, a second regulation, the Drinking Water Protection Regulation for Smaller Waterworks Serving Designated Facilities came into effect. This regulation significantly expanded the scope of the Ministry's monitoring responsibilities by introducing new sampling and testing requirements for many previously unregulated smaller waterworks facilities.

Over the past year, the Ministry has continued to address drinking water issues. In the two-part report of the Walkerton Inquiry released in January and May 2002, Mr. Justice Dennis O'Connor made many recommendations for improving Ontario's water system from "source to tap." The government has accepted these recommendations and has committed to implementing all of them eventually. Many were addressed in Ontario's new *Safe Drinking Water Act*, passed in December 2002. Subsequent to our audit, in May 2003 new regulations were enacted to support this legislation. The regulations increase the number of waterworks covered by the Act and set out specific sampling and testing requirements for each waterworks type. Future initiatives will be necessary to address many of the remaining recommendations of the Walkerton Report, in particular, those calling for protection of Ontario's water at source (that is, prior to being processed by waterworks facilities).

Drinking Water Information System (DWIS)

Since 2000, the Ministry has been developing a Drinking Water Information System (DWIS) to support its new monitoring and reporting requirements. DWIS was designed to allow the electronic submission of water quality test results to improve timeliness and reduce re-inputting errors. It also partially addressed a number of Justice O'Connor's recommendations calling for improvements to the Ministry's information systems. In 2001, the Ministry launched an interim Web-based application to register all waterworks and receive water-sample test results electronically from laboratories servicing them. This interim application was to be replaced in March 2002 by the full version of the new DWIS, an Environet application that would provide additional features. For simplicity, we refer to both the interim and the planned system as DWIS. The Ministry had spent approximately \$6.9 million to develop this system at the time of our audit.

By October 2002, the Ministry did implement significant components of the new system. DWIS can now register large waterworks, accept their quarterly reports, and record their Adverse Water Quality Incidents (AWQI). At the time of our audit in March 2003, however, key components of DWIS remained to be implemented. The Ministry had not completed the registration of all smaller waterworks and was still working to complete the fully integrated DWIS application. Perhaps more importantly, reporting tools to help management track and summarize test submissions for regulatory non-compliance were still under development.

The DWIS database, which contains all registered waterworks and their reported water-sample test results, has great potential to help ministry inspectors plan and prioritize their work of ensuring that waterworks facilities are operating properly. Summary reports could pinpoint which waterworks present the greatest health risks for Ontarians. Examples of reports that could be generated are: waterworks that are submitting significant numbers of exceedances or not submitting test results; facilities that are not meeting the frequency requirements established by regulation or not submitting reports on time; and laboratories that do not follow proper testing procedures, that are not accredited for the tests they are performing, or that are not properly communicating AWQI to all required parties.

DWIS is also used to record basic profile information on all registered waterworks; however, we found some of the database records to be inaccurate. For example, we found 50 waterworks registered incorrectly in the system and several with inaccurate profile information.

Recommendation

To ensure that the quality of Ontario's drinking water is properly monitored and that appropriate inspection and other follow-up action is taken on a timely basis when necessary, the Ministry should:

- complete the development of the Drinking Water Information System (DWIS) as soon as possible;
- explore ways to use DWIS and its data to generate reports that would help inspectors identify and prioritize candidates for inspection and summarize waterworks regulatory compliance; and
- improve validation procedures to ensure all waterworks records in DWIS are accurate.

Ministry Response

The Ministry acknowledges the importance of completing the development of the Drinking Water Information System (DWIS). DWIS development has progressed considerably since the audit.

The Ministry is committed to ensuring that the transition to DWIS is done effectively and efficiently, while protecting public health. The Ministry is using existing systems to discharge its drinking water responsibilities until DWIS is fully operational. Recent investments in both human and financial resources will ensure the full operation of manual systems while DWIS is being completed.

The Ministry acknowledges the importance of using DWIS to identify and prioritize candidates for inspection. The Ministry has made a strong commitment to inspection and enforcement as a key part of its approach to manage drinking water. The Ministry annually inspects 100% of all municipal water systems that serve over 80% of the population of Ontario. In addition, the

Ministry conducts one unannounced inspection of municipal water systems for every three proactive inspections.

The Ministry will continue to explore ways to use DWIS as part of its overall risk assessment processes to help inspectors identify and prioritize candidates for inspection and summarize waterworks regulatory compliance.

The Ministry ensures the waterworks records held in DWIS are accurate by conducting Quality Assurance/Quality Control on all waterworks profile information received from waterworks by reviewing data against other ministry databases and contacting waterworks to resolve any discrepancies or obtain missing data.

Once fully operational, DWIS will allow for further improvements to data accuracy and cross-checks in the maintenance of waterworks profiles. The Ministry will require waterworks to use “smart forms” to submit profile information—these forms have a built-in capacity to conduct primary validation of data. Ministry staff will continue to review all data and conduct secondary validation as necessary (for example, by contacting waterworks to resolve discrepancies).

Submission of Water-Sample Test Results

All waterworks are required to submit water samples at regular intervals to an accredited laboratory to test for the presence of many chemical or organic substances. The laboratory then submits the test results electronically to the Ministry via DWIS. We found that DWIS was unable to identify whether all waterworks were submitting these required sample test results. Accordingly, we used data-extraction procedures and our results indicated that while municipal waterworks generally did submit samples, the Ministry had never obtained test results from 300 of the 1,476 registered non-municipal waterworks. The Ministry followed up on and resolved 63 of these 300 waterworks; however, the remaining 237 were still being reviewed at the conclusion of our audit fieldwork.

Furthermore, the regulations of the *Ontario Water Resources Act* specify a minimum frequency of testing on certain high-risk substances, such as *Escherichia coli* (*E. coli*) bacteria and fecal coliform. We performed additional data-extraction work to summarize all test results submitted since DWIS became operational and found that for 612 (approximately 27%) of the registered waterworks, the Ministry did not obtain the minimum number of water samples for these two substances.

Recommendation

To enhance its ability to respond to water problems promptly, the Ministry should improve controls to ensure all waterworks submit their water-sample test results and compliance reports in accordance with regulatory requirements.

Ministry Response

The recommendation is fully consistent with the Ministry's compliance objectives. One hundred percent of quarterly test-result reports from municipal water systems that serve over 80% of the population are tracked and followed up on. In terms of recent improvements, Drinking Water Information System reporting to identify waterworks and laboratories that do not supply required information to the Ministry has now been completed. These compliance reports, which were not available at the time of the audit, have significantly increased the Ministry's oversight powers by automatically notifying ministry inspectors of waterworks and laboratories that are not submitting sample test results and reports as required by regulations.

EXCEEDANCES AND ADVERSE WATER QUALITY INCIDENTS

A water sample is considered an exceedance whenever it contains more than the maximum acceptable concentration limit for substances as specified by the *Ontario Water Resources Act* regulations. Treated-water exceedances are further classified as Adverse Water Quality Incidents (AWQI) if they relate to potentially serious health concerns. Ministry policy is to follow up on all AWQI to determine their cause, to ensure appropriate corrective action is taken, and to notify the public where necessary (such as an advisory to boil water).

Given the increased number of facilities now requiring monitoring, the past compliance problems with many of them, and the available inspection resources of the Ministry (see "Inspections and Management Information Systems" later in the report for more information), a good system to plan and prioritize follow-up activity is critical. While we noted significant numbers of reported water quality problems flagged in DWIS, the system did not provide sufficient information to help ministry staff deal with these problems effectively. Specifically:

- DWIS reports did not distinguish AWQI from other exceedances. AWQI are considered the most significant type of exceedance and demand immediate investigation and resolution because of the potential health risks associated with the substances in question. Therefore, the system should highlight AWQI exceedances.
- Waterworks and laboratories submit both raw-water (untreated or source) and treated-water (processed and ready for distribution) test samples into DWIS. Raw-water exceedances may not be indicative of quality problems if treatment removes unwanted substances. At the time of our audit, DWIS reports did not distinguish between raw- and treated-water exceedances separately. Also, the system did not have sufficient edit controls to reject obvious conflicting test results, such as where samples were reported as "distributed" or "treated" even though they had been taken from an "untreated" sample location.

- In our sample testing of the maximum acceptable concentration limits maintained in DWIS, we found that the system had not always been updated when new or amended regulatory standards came into effect. For example, the acceptable concentration limits for uranium and bromate were amended in July 2002, but this information had not been uploaded onto DWIS. If updates are not kept current, DWIS cannot accurately flag results where acceptable concentration levels have been exceeded.

Once we brought a number of suspect AWQI issues to its attention, the Ministry quickly investigated and found that most were raw-water samples rather than treated-water samples (that is, water for drinking). Others were older AWQI that had not been properly reported by a few laboratories. However, our concern is that future incidents could occur and not be properly investigated without improved DWIS reporting capabilities.

Because of the difficulties with existing DWIS reports, we used computer-assisted techniques to extract only treated-water exceedances from the database. As the following table summarizes, many waterworks continue to report exceedances including the more serious AWQI. Although relatively infrequent (less than 1%) in comparison to the total samples in the DWIS database, our data extraction identified 6,725 exceedances over the past two years. Of these, 3,181 were classified as AWQI.

**Analysis of Water-Sample Test Results
Submitted to the Ministry**

Time Period	Test Results Received	Waterworks with Exceedances	Exceedances	AWQI ¹
2001	555,544	376	2,491	1,331
2002	1,230,474	850	3,878	1,515
Jan–Feb 2003	115,209	171	356	335
Total	1,901,227	²	6,725	3,181

¹ The AWQI figures include incidents relating to *E. coli*/fecal coliform, total coliform, heterotrophic plate count (HPC), background coliform, and sodium.

² No total is provided to avoid double counting waterworks that had exceedances in more than one year.

Source of data: Ministry of the Environment

Recommendation

To improve its ability to investigate and resolve water problems promptly, the Ministry should:

- **enhance the existing system to highlight all Adverse Water Quality Incidents for management attention to ensure timely follow-up action; and**

- promptly update substance concentration limits to reflect new and amended standards.

Ministry Response

The Ministry takes all Adverse Water Quality Incidents (AWQI) very seriously and has systems in place to respond. The Ministry uses a science-based framework for classifying AWQI as high or low risk. Where a high-risk problem has been identified, the Ministry responds with immediate (24/7) on-site inspectors who undertake the appropriate response. To better ensure all high-risk AWQI are responded to as soon as possible, the Ministry will develop Environet reports that highlight AWQI. In the case of low-risk AWQI, the Ministry has established protocols for staff to use in determining the appropriate response.

The recommendation to update substance concentration limits promptly is consistent with the Ministry's approach. The Ministry has put procedures in place to ensure that new standards, once brought into effect through a new or amended regulation, will be input into the Drinking Water Information System on a timely basis.

REPORTING OF ADVERSE WATER QUALITY INCIDENTS

The *Ontario Water Resources Act* regulations require laboratories and the waterworks owners to report any AWQI immediately to the local medical officer of health and the Ministry. These notifications, which must be by telephone to live persons, are in addition to the requirement to submit all sample results electronically into DWIS. Upon receiving such notification, ministry staff must investigate the incident to ensure that all AWQI are properly resolved.

Our data-extraction testing identified several waterworks with significant numbers of AWQI. We investigated what follow-up actions had been taken on these incidents and concluded that the Ministry needed to improve its AWQI monitoring and tracking procedures:

- Our testing indicated that not all laboratories were notifying the Ministry as required when AWQI occur. For example, for one of our sample waterworks, the Ministry was not aware of 31 out of the 46 AWQI that were identified in DWIS, since the system did not generate an exception report from the electronically submitted data.
- Conversely, we found instances where laboratories had reported AWQI to the Ministry in accordance with the verbal notification requirements but did not submit the sample results electronically into DWIS. We also noted instances where AWQI were attributed to the wrong waterworks. A reconciliation of the verbal AWQI notifications and the submitted water-sample results would help ensure that all AWQI have been properly investigated.

- After laboratories report AWQI to the Ministry, DWIS is used to track proper notification of the incident to all required parties. However, DWIS is not used to record follow-up action, corrective orders issued, or incident resolution. Inspectors document these efforts on a province-wide system that is not currently linked to the suite of Environet applications. Since these functions are not integrated, the Environet system cannot produce reports that allow management to easily monitor whether all AWQI are being addressed.

Recommendation

To ensure that all serious water problems are corrected, the Ministry should consider incorporating a follow-up reporting/resolution module within the Drinking Water Information System that would provide information to management about incident resolution for each Adverse Water Quality Incident.

Ministry Response

Information about incident resolution for each Adverse Water Quality Incident (AWQI) is currently contained in a province-wide system. When an AWQI occurs, the Spills Action Centre creates an incident report. The information will then be sent automatically to the proper district office for follow-up activities, and the resolution for the incident is recorded. The new Drinking Water Systems Regulations effective May 2003 make it mandatory that a report be submitted to the Ministry for every AWQI no later than seven days after the issue has been resolved. The Ministry uses both Environet and non-Environet systems in a comprehensive management information system. The Ministry is developing a strategy that will assist in meeting the longer-term solution of full integration of both Environet and non-Environet systems.

HAZARDOUS WASTE

More than 2 million tonnes of hazardous waste are generated in Ontario every year. Much of this waste must be transported to approved treatment facilities located throughout the province. Transporting waste entails the risk of spills and seepage that could cause considerable environmental damage. We noted that in its recent inspection sweep of hazardous waste generating and processing facilities, the Ministry found compliance problems with all 22 facilities inspected. For instance, unapproved handling or treatment of waste occurred at 95% of these facilities. Additionally, inspectors found six hazardous-waste generators that had failed to register with the Ministry.

Hazardous Waste Information Network (HWIN)

Ministry regulations require tracking documents called manifests to be used to record all hazardous waste movement in the province. Each waste generator, carrier, and receiver completes separate parts of a manifest, and both the generator and the receiver must submit manifest copies to the Ministry. There are approximately 225,000 hazardous waste movements annually.

In late 2001, the Ministry began developing an Environet application known as the Hazardous Waste Information Network (HWIN). HWIN would replace the previous Hazardous Waste Information System (HWIS) and was designed to eliminate paperwork and reduce processing errors by enabling the electronic submission of both manifests and fees. The HWIN system was implemented in February 2002 and the Ministry had spent \$4.1 million on this system at the time of our audit.

Since a key goal of HWIN was to move to an electronic-manifest system, it was developed without the capability to support paper manifests. However, this lack of functionality has proven problematic. All three parties to a hazardous waste movement transaction—the generator, the carrier, and the receiver—must be equipped to handle electronic manifests before the HWIN system can be used. The result has been minimal use of the new system.

In its first year of operation, only 1,885 (less than 1%) hazardous waste movement manifests were processed through HWIN. The rest were still handled by the paper-manifest system. Accordingly, few of the efficiency goals for the HWIN system have been achieved and both systems must be maintained to handle all manifests properly. At the time of our audit, the Ministry was addressing this problem through a project to develop a paper-manifest component within HWIN.

As well, at the time of our audit, the HWIN system had few analysis and reporting capabilities. For example, it could not produce summary reports of the generation and movement of hazardous waste, even though such benefits were cited in the Ministry's business case for the system. Furthermore, it did not generate reports that would highlight possible inspection candidates. In fact, we found the former HWIS to have a superior reporting capability. Unlike the present system, HWIS could produce reports that showed the disposal history of a specific generator or the total amount of waste moved in a given timeframe for a specific generator or receiver.

Recommendation

To ensure that all hazardous waste movements are properly monitored to minimize the risk to the public, the Ministry should:

- **develop and deliver an ongoing incentive, conversion, and communication strategy to promote the adoption of electronic manifests by the hazardous waste industry; and**

- develop Hazardous Waste Information Network analytical and reporting tools that provide summary information related to the generation and movement of hazardous waste and help identify potential problems warranting follow-up.

Ministry Response

The recommendation is consistent with the Ministry's current approach. The Ministry has initiated a "Hazardous Waste Information Network (HWIN) Outreach" strategy to increase and enhance use by clients, thereby improving the quality and quantity of information on HWIN. This initiative will provide information on the electronic registration, manifest, and fees systems. It will provide an open forum in which HWIN users can identify problems with the systems and obtain responses from the Ministry. As well, it will allow users and the Ministry to identify and develop mutually beneficial options to add value to the HWIN system. The Ministry is also developing a supplemental training package about the HWIN systems for users that is based in part on feedback from hazardous waste generators, carriers, and receivers.

When resources become available, the Ministry intends to build into HWIN analytical and reporting tools that will, for example, provide summary information on the generation and movement of hazardous waste. Until HWIN has this capacity, the Ministry will continue to obtain such information from the present Hazardous Waste Information System.

REGISTRATION OF HAZARDOUS WASTE FACILITIES

Every year, the Ministry requires all generators to register in HWIN by submitting details of their facilities and the composition of the waste that they are generating. All carriers and receivers are also requested to register voluntarily with the Ministry. Registration ensures that the Ministry has a complete inventory of all hazardous waste facilities.

All generators must use ministry-approved carriers and receivers for their hazardous waste. Certificates of approval are issued for this purpose and the ministry staff use HWIN to track the approved waste types that each carrier and receiver can handle.

The due date for annual re-registration is February 15. However, we noted that the majority of generators fail to register on time, and the Ministry makes little effort to follow up on delinquent registrants. For example, although approximately 22,000 generators eventually registered with the Ministry in 2002, only 7,986 had registered by the February 15 due date. The problem continued in 2003, with only 9,368 generators registered by the February 15 due date. Without complete industry information, some facilities may escape inspection and therefore compromise the Ministry's efforts to protect the ecosystem and human health.

Although relatively infrequent in comparison to the total number of hazardous waste movements, the HWIN system had flagged a number of unauthorized waste movements

since its introduction last year. However, we found no evidence of follow-up action for any of these movements. For example, we noted 1,697 (less than 1%) hazardous waste movements by unregistered generators, and 3,720 (less than 2%) hazardous waste movements for which the generator did not have ministry approval for the type of waste moved. Carriers and receivers were also moving waste that they were not authorized to handle.

Recommendation

To ensure that all hazardous waste is moved in accordance with regulatory standards, the Ministry should:

- ensure all active hazardous waste generators are registered;
- investigate hazardous waste movements initiated by unregistered generators; and
- investigate hazardous waste movements where the generator, carrier, or receiver is not authorized to handle the waste type.

Ministry Response

Under current regulation, the requirement to register is the sole responsibility of the generator. To reinforce this requirement, the Ministry has provided up to three reminders to hazardous waste generators known to the Ministry.

With respect to investigating hazardous waste movements by unregistered generators, the recommendation is consistent with the Ministry's current approach. The Ministry has now developed a comprehensive and integrated program for monitoring hazardous and liquid industrial wastes, from their point of generation through to their ultimate disposal, of which the Hazardous Waste Information Network is one component.

In order to deal with specific compliance issues related to the hazardous waste industry, the Ministry's Environmental SWAT (originally Soil, Water and Air Team) has implemented a targeted compliance strategy over the past 18 months. During that time, SWAT conducted widespread inspection sweeps of hazardous waste transfer and processing facilities, which included examining both generator registration and receiver documentation. In addition, SWAT has conducted numerous inspections of hazardous waste carriers to, among other objectives, verify hazardous waste manifests.

AIR

Air pollution is a serious threat to our health, environment, and economy; in Ontario, over 10 million tonnes of airborne contaminants are emitted annually. The Ministry classifies air issues as global, regional, or local. Global air issues include dealing with emissions causing

climate change that increases average global temperatures or results in stratospheric ozone depletion. Regional air issues include acid rain from the release of sulphur dioxide and nitrogen oxides, or smog from the emission of particulate matter, sulphur dioxide, nitrogen oxides, or volatile organic compounds. Local air issues include air toxicity from elevated local concentrations of compounds, such as metals, volatile organic compounds, soiling, or odours.

In May 2000 and May 2001, respectively, the government introduced new regulations under the *Environmental Protection Act* to increase public accountability for all air pollution sources and to improve monitoring and disclosure of environmental pollutants. The first regulation, Electricity Generation—Monitoring and Reporting, covered the electricity sector, and the second regulation, Airborne Contaminant Discharge Monitoring and Reporting, widened the requirements to cover many other industrial sectors. The second regulation (O. Reg.127/01) requires all industrial (including the electricity sector), commercial, institutional, and municipal facilities subject to the regulation to monitor and report on their emissions annually for any of the more than 350 airborne contaminants, should their respective annual thresholds be exceeded. Smog season (May 1 to September 30) reporting is required for those criteria air contaminants if their emissions exceed their respective annual thresholds. For facilities that maintain large discharge units, quarterly reports must also be submitted.

Ontario Air Emission Registry (OnAir)

OnAIR is the Environet system designed to provide the public with timely access to information on air emissions data reported by the facilities under O. Reg.127/01. These data support the Ministry's air quality initiatives and development of future environmental programs. Emissions data in OnAIR replaced those collected under the previous voluntary survey reporting program that had a low response rate. OnAIR allows facilities to submit emission reports electronically to the Web site. The facilities are responsible for the accuracy of their reported emission data. The Web site has been operating since May 2002. The Ministry had spent approximately \$3.3 million to develop the system at the time of our audit.

We provided our observations and made recommendations on the Air Emission Registry (OnAir) to the Ministry and have received satisfactory management responses to our recommendations, which included ministry action plans to address them. Our key recommendations were that the Ministry should:

- complete the inventory of the facilities that should be reporting air emissions;
- verify if facilities are approved to emit the substances they report on; and
- periodically verify the accuracy of data submitted.

We will follow up on the Ministry's action plans when sufficient time for implementation of our recommendations has elapsed.

INSPECTIONS AND MANAGEMENT INFORMATION SYSTEMS

Physical inspections are critical in assessing compliance with legislative requirements, and good management information systems can help inspectors prioritize their activities by identifying areas of high risk. In the 2002/03 fiscal year, the Ministry had a staff of 261 environmental officers—30 were assigned to the SWAT inspection group and 231 worked out of five regional offices. Under the Ministry's new policy, the regional staff are to inspect all municipal waterworks facilities annually. As well, they inspect many other areas of environmental importance to Ontarians, including air facilities, refrigeration/ozone-depleting sites, pesticides, industrial biosolids, municipal biosolids, septage hauler/disposal facilities, municipal sewage treatment plants, sub-surface sewage disposal systems, PCB sites, and both open and closed waste disposal sites. The Ministry is also developing an inspection program for laboratories that conduct water-sample tests.

During our office visits to different areas, we interviewed a number of regional inspectors who conduct inspections of water, hazardous waste, and air facilities. None used the Environet applications or their data. Notwithstanding, when we discussed the type of data available from Environet, the inspectors commented that this data could be useful in identifying appropriate inspection targets.

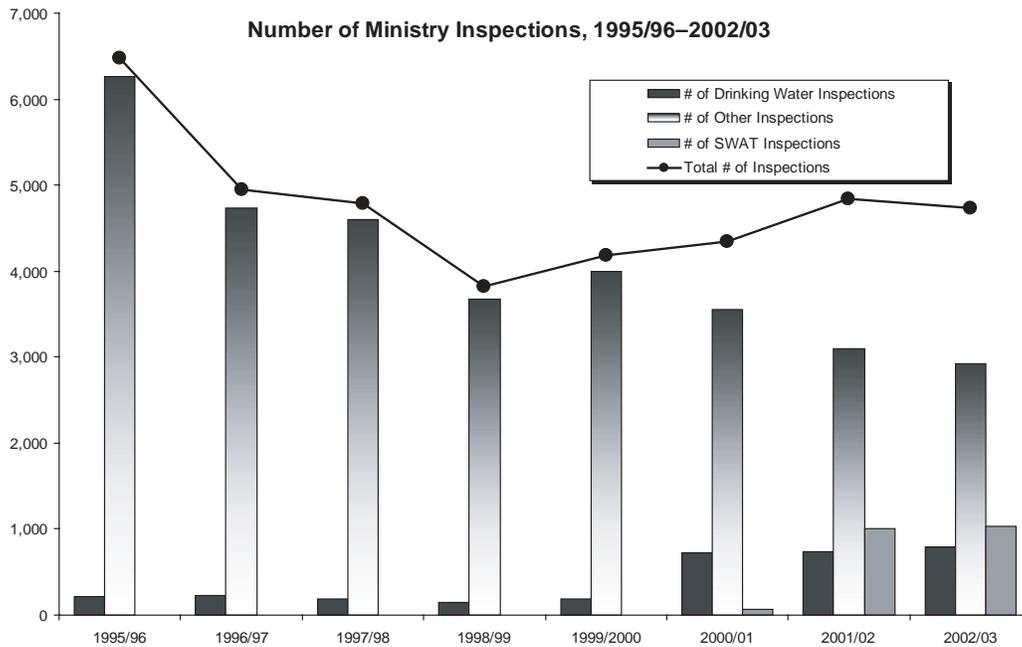
We have made many comments about the Ministry's inspection efforts in the past, dating back to the 1980s. For example, in our 1994 audit of water- and sewage-treatment facilities, we noted that the drinking water facilities with more significant compliance problems were mainly the smaller ones and recommended increased surveillance. In our 2000 audit of the Operations Division, we recommended that the Ministry explore options to increase its inspection coverage. Since then, the Ministry has introduced the SWAT team to focus on priority areas across the province and in January 2001 it hired another 25 water inspectors to increase coverage of this critical sector.

The SWAT group is a province-wide team that uses a risk-assessment framework to target specific sectors based on past instances of non-compliance and the potential for major effects to human health or the environment. Since its inception in September 2000, the SWAT team has conducted more than 2,100 inspections in sectors such as electro/metal-plating, hazardous waste transfer and processing, industrial waste haulers, pesticide applicators, and auto-body and repair shops.

The SWAT group makes use of an Environet application—the Computer Assisted Mobile Enforcement Office (CAMEO) system—that was introduced in May 2002 to provide them with the ability to access and maintain inspection information while in the field. In addition to this mobile capability, CAMEO integrates several features that include a case management module, time tracking, data analysis, and reporting. The Ministry had spent \$2.8 million to develop the system at the time of our audit. We reviewed the CAMEO application and found that it was working well.

The result of the preceding initiatives is an increase of 13%, from 4,182 total ministry inspections in 2000 to 4,734 in 2002. As well, in November 2002 the Ministry developed a new Municipal Drinking Water Inspections Protocol to address many of the Walkerton Report recommendations.

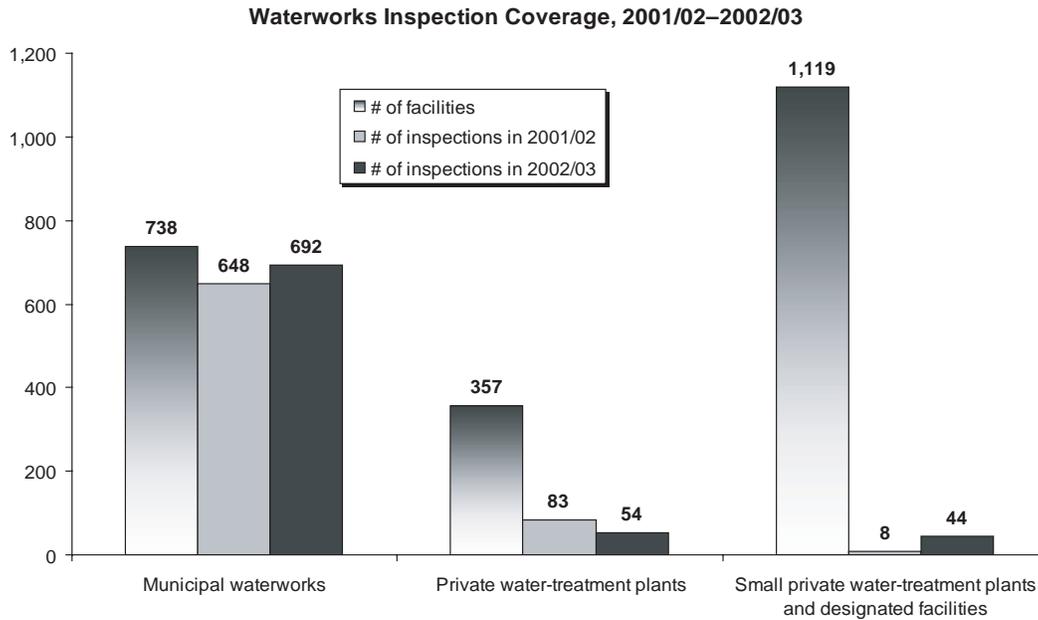
There are still significant concerns with inspection coverage, however. For example, the following chart, which excludes vehicle emission inspections, shows that the new policy of annually inspecting all municipal waterworks has had a negative impact on the Ministry's abilities to cover other environmental sectors. As well, even after accounting for the new SWAT group, inspection activity for 2002/03 is currently at 73% of 1995/96 levels. The Ministry has informed us that this can be attributed to the fact that the inspections are now more compliance-related and more comprehensive, and therefore they take longer to carry out than in the mid-nineties. Notwithstanding, this decrease in the number of inspections is worrisome because the number of facilities now covered by the new regulations has increased and will continue to do so.



Source of data: Ministry of the Environment

Although inspection coverage of smaller waterworks facilities is currently minimal, there has recently been a renewed focus on these facilities. Registration and the submission of sample tests are now required from many previously unregulated, private, smaller waterworks and designated facilities. However, to date the Ministry has not established any proactive inspection frequency requirements for them. Ontario's Environmental Commissioner also expressed concern in his 2002 annual report that the Ministry did not inspect these facilities enough. He stated that they often serve susceptible populations, such as seniors and children, who are less resistant to contaminants and who face higher health risks than the general population. As the following chart summarizes, in 2002/03 the Ministry conducted

54 inspections on the 357 non-municipal, private water-treatment plants and 44 inspections on the 1,119 small, private water-treatment plants and designated facilities.



Source of data: Ministry of the Environment

Our analysis of ministry records also indicates that—except for the SWAT team that now conducts about one-quarter of all inspections—total inspection coverage is actually dropping.

The following table illustrates this point. Since 1999/2000 the Ministry has increased the number of drinking water program inspectors by 57, bringing the total number of regional inspectors to 231 (an increase of 33%). However, over the same period, the number of inspections conducted actually dropped by 11% (from 4,182 to 3,707). Given the increased number of inspectors, this drop represents a decrease from an average of 24 inspections completed annually per regional inspector in 1999/2000 to 16 inspections on average last year. The Ministry informed us that this can be attributed to the increase in length of time it now takes to conduct inspections. For example, a drinking water system inspection takes more than twice as long to complete under the current inspection process.

Inspections Conducted by the Ministry

	SWAT		Regional Offices			Total	Overall Total
	Inspectors	Inspections	Regional Inspectors	Water Inspections	Other Inspections		
1999/2000	n/a	n/a	174	185	3,997	4,182	4,182
2000/01	30	78	180	718	3,552	4,270	4,348
2001/02	30	1,005	199	739	3,097	3,836	4,841
2002/03	30	1,027	231	790	2,917	3,707	4,734

Source of data: Ministry of the Environment

Another issue is how inspectors are allocated across the province. The Ministry divides the province into five regions. However, we noted that only 37 of the 231 inspectors were assigned to the province's central region, where more than 5 million Ontarians reside or almost half of Ontario's population. By contrast, the northern region, which serves fewer than 1 million people, has been assigned 39 inspectors. We saw no formal evidence or analysis that supported the allocation of inspectors by region. Such an analysis would include factors such as the number and size of facilities to be inspected and travel distances.

As stated earlier, inspectors are not currently using the Environet systems to plan or prioritize their work. We found that inspectors were not able to access the most accurate, complete, and timely information available, particularly regarding compliance history. Summary reports that use the information in Environet databases would improve the process of risk-based inspection planning; for example, reports to water inspectors could analyze past exceedances by facility, by seriousness, and by type. Accordingly, we urge the Ministry to accelerate the development of an Environet reporting application to provide the information that management and inspectors need.

Recommendation

To ensure inspection coverage is risk-based and that inspection resources are allocated most efficiently, the Ministry should:

- **develop Environet reports that analyze the state of Ontario's environment and compliance with its regulations so that inspection resources can be allocated based on the greatest risks to human health;**
- **re-assess waterworks inspection coverage to ensure more non-municipal waterworks are inspected; and**
- **complete the development of a regime for laboratory inspections to ensure testing standards are being met and all Adverse Water Quality Incidents are reported promptly.**

Ministry Response

The Ministry uses reports and information generated from across all program areas and databases, not just from Environet systems, to inform its work-planning and priority-setting activities. The Ministry recognizes that improvements to the resource allocation process are likely to come from a better ability to collect, integrate, and analyze data, particularly through our Environet strategy. As a first step, the Ministry is developing an information technology strategy to bring many drinking water databases together into one Environet-compatible network and data model.

In addition to the Drinking Water Information System, the Ministry has received funding to develop systems such as the Laboratory and Waterworks Inspection System, which will contribute significantly to inspection and compliance functions. When complete, this system will electronically assess waterworks

and provide a grading to identify and prioritize candidates for inspection. All aspects of the Ministry's inspection and compliance strategy work together to target waterworks that may be non-compliant, most particularly in areas related to the protection of human health.

Municipal drinking water systems provide drinking water to more than 80% of Ontario's population. The Ministry now has a regulatory obligation to inspect all municipal drinking water systems on an annual basis. It has and will continue to fulfill this obligation. For non-municipal waterworks, the Ministry has now developed a structured risk-based program that responds to health-based Adverse Water Quality Incidents or complaints as necessary to protect public health and safety.

The Ministry is making progress on the development and implementation of its laboratory licensing and inspection program. The Ministry's inspection program (which ensures compliance with regulatory requirements) will be operational by October 1, 2003. Ontario's accreditation program, which focuses on technical proficiency in the laboratories doing the testing, has been operational since 2000.