

Ontario Clean Water Agency

Background

The Ontario Clean Water Agency (OCWA) is a Crown Agency of the Province of Ontario established in 1993 under the *Capital Investment Plan Act*. OCWA's mandate is to provide reliable and cost-effective drinking-water and wastewater services primarily to municipalities on a cost-recovery basis, and to provide these services so as to protect human health and the environment. OCWA reports to the Legislature through the Minister of the Environment.

There are almost 1,200 municipal drinking-water and wastewater systems in Ontario. A drinking-water system includes the drinking-water treatment facility and the distribution system that delivers the water to homes and businesses. A wastewater system comprises a wastewater treatment facility and the collection system that delivers the wastewater to the facility. OCWA operates 24% of the municipal drinking-water systems and 36% of the municipal wastewater systems in Ontario, serving approximately 180 clients, most of which are municipalities. OCWA also provides services to a small number of commercial, industrial, and institutional facilities, as well as management oversight services for several First Nations communities. Other services provided by OCWA include project management for facility maintenance and construction, development of pre-

ventative maintenance procedures, capital improvement planning, and loan financing.

OCWA employs almost 700 staff, including facility operators, mechanics, engineers, and project managers. Five regional managers who report to the agency's head office in Toronto oversee 20 hub or satellite offices. The hub office structure is intended to provide economies of scale by reducing operation and maintenance costs for individual municipalities and by sharing management, administrative, and specialist support services. The geographical distribution of the regional and hub offices, including related water treatment and wastewater treatment facilities, is shown in Figure 1.

Figure 1: OCWA Regional and Hub Offices and Facilities

Source of data: OCWA

Regional Office	# of Hub Offices	# of Facilities		
		Drinking-water	Waste-water	Total
South Peel	0*	2	4	6
Waterloo	3	16	19	35
Western	5	36	47	83
Eastern	5	93	55	148
Northern	7	168	98	266
Total	20	315	223	538

* South Peel is OCWA's single largest client and accounts for over 10% of OCWA's operations revenue.

In 2007, OCWA generated revenue of almost \$120 million and a net income of \$6.6 million, which consisted of financing income of \$7.9 million, offset by an operating loss of \$1.3 million, primarily from the operation and management of water and wastewater facilities.

Audit Objective and Scope

The objective of the audit was to assess whether OCWA has adequate oversight and management procedures in place to ensure that it provides effective drinking-water and wastewater treatment services cost-effectively and in compliance with legislation and corporate policy, and that it measures and reports on its performance. The criteria used in our audit related to systems, policies, and procedures that OCWA should have in place, and were discussed with and agreed to by OCWA management.

The scope of our audit included discussions with staff at corporate, regional, and hub offices, as well as a review and analysis of relevant documentation, including data produced by OCWA's management information systems. We carried out our work at OCWA's head office in Toronto, one regional office, and three hub offices throughout Ontario. The Ministry's internal audit services had performed a number of audits at OCWA in the last two years. These audits included a review of the operations of five hub offices and a review of financial and internal control systems. We found these audits useful in finalizing the scope and extent of our audit work.

Our audit followed the professional standards of the Canadian Institute of Chartered Accountants for assessing value for money and compliance. We set an objective for what we wanted to achieve in the audit, and developed audit criteria that covered the key systems, policies, and procedures that should be in place and operating effectively. We discussed these criteria with senior management at the Ontario Clean Water Agency. Finally, we designed and conducted tests and procedures to address our audit objectives and criteria.

Summary

We found that the Ontario Clean Water Agency (OCWA) generally had adequate procedures in place to ensure that it provides effective drinking-water and wastewater treatment services. As well, OCWA has been making headway in achieving full cost recovery in the operations side of its business. Nevertheless, we identified a number of areas where further improvements could be made:

- A regulation under the *Safe Drinking Water Act, 2002* requires that drinking water be tested for over 160 substances such as *E. coli*, lead, and uranium. We reviewed water-quality testing at 15 OCWA-operated facilities and found that water samples were collected and tested by accredited laboratories, as required. Overall, 99.6% of water samples tested met legislated quality standards. While, on average, OCWA-operated facilities experienced more adverse drinking-water-quality incidents than other provincial drinking-water systems, they had relatively fewer microbiological incidents, which pose the greatest risk to human health. OCWA needs to determine what further actions are necessary to ensure that any systemic issues are identified and acted upon.
- Another type of water-quality incident is wastewater discharge into the environment when contaminants exceed the limits set by the Ministry of the Environment (Ministry). These incidents most commonly relate to the age of the wastewater facility or the design of the wastewater collection system. Although OCWA-operated facilities experienced fewer such incidents than the industry overall, it could further reduce these incidents by working with the Ministry and municipalities to prioritize the required upgrading or replacement of facilities and wastewater collection systems.

- To help monitor the facilities it operates for compliance with legislation, OCWA has implemented a facility assessment review and a more in-depth compliance audit process. While plans were developed to correct the compliance issues identified, these issues were often not corrected in a timely manner.
- The Ministry inspects drinking-water facilities annually and wastewater facilities every three years. In general, for significant issues of non-compliance, the Ministry issues a provincial officer's order. We found that, although OCWA accounts for only one-quarter of the inspections done by the Ministry, the facilities it operated accounted for over half the provincial officer's orders issued. Many of those orders were issued to facility owners (municipalities) and were related to the state of the facility.
- Drinking-water and wastewater facility operators are required to meet a number of educational and experience requirements and hold a valid certificate or licence. Over 10% of the sample of operators we reviewed were listed in OCWA's records as not having the proper certificate or licence. For example, some of these operators were listed as having expired certificates. Although we were subsequently provided with evidence that these operators held valid certificates, this is indicative of the need for more timely oversight of this area.
- Over the last five years, OCWA's expenses have increased only 2.8% annually, on average, and OCWA has been successful in reducing its operating deficit from \$9.5 million in 2003 to \$1.3 million in 2007.
- The majority of OCWA's 205 contracts to provide facility operating and maintenance services are for a fixed price over several years, adjusted for inflation. Consequently, OCWA bears the risk of any price increases above the rate of inflation. In addition, its margin or markup on direct costs may not be sufficient to cover all overhead costs. We found that some contracts did not even recover all direct contract costs.
- The employee travel expenses we tested were for legitimate business purposes and were properly approved. However, controls over the purchase of goods and services needed to be improved. For example, in contravention of its competitive purchasing policy, OCWA selected a vendor for a \$3.7 million contract through an invitational rather than a public tender, and when the contract expired, it was extended without any competitive process.
- OCWA needs better information to adequately monitor its field operations. In addition, it needs to enhance the reliability and usefulness of its reporting to the senior management committee and the Board of Directors to assist them in effectively meeting their respective management and oversight responsibilities. We did note that OCWA has recently been successful in adding several well-qualified members to its Board of Directors.
- OCWA has developed a number of good performance measures during its business planning process, and has reported on these measures in its annual report, which is available to the public.

OVERALL OCWA RESPONSE

As an organization committed to delivering safe, reliable, and cost-effective services that our clients can trust, the Ontario Clean Water Agency (OCWA) appreciates the thorough audit by the Auditor General and is taking action to address all audit observations and recommendations within OCWA's ability to address.

OCWA has always strived to achieve 100% compliance with the regulations, guidelines, and objectives with a goal of continuous improvement each year. Our employees live and work in the communities that we serve and are personally committed to providing safe, reliable, and cost-effective services.

OCWA is proactive in its approach to providing quality service delivery. Before recent legislative changes that increased the requirements for operators of water and wastewater systems, OCWA had developed several management systems, processes, and tools that exceed the requirements of legislation in order to support our managers in delivering quality services. These include systems to record and track process data, environmental incidents, maintenance schedules, environmental management, and health and safety matters, as well as processes such as operational audits. Since OCWA does not own the facilities that it operates, it does not control the design and ongoing capital upgrading of the treatment plants and related infrastructure.

OCWA plans to continue building on its commitment to safeguard public health and the environment by defining its social-responsibility framework more clearly. This will build upon OCWA's existing role in supporting the efforts of the Ministry of the Environment in providing a safety net for Ontario's water and wastewater systems.

of drinking-water systems and the ongoing testing of drinking water. A drinking-water health hazard is a condition that endangers or is likely to endanger public health.

At the facilities operated by OCWA, its staff are responsible for routinely collecting water samples to be sent to accredited laboratories for testing. The frequency and type of testing required vary according to the type of drinking-water system, size of the population served, and water source. Depending on the nature of OCWA's responsibilities, tests can be performed on the water entering the treatment facility, on the treated water that enters the distribution network of pipes that distribute the water to users, and on the water at a sample of households or end users.

A regulation under the Act requires the testing of almost 160 substances to ensure that they do not exceed specified limits. The substances tested fall within five broad categories:

- microbiological—all types of coliform bacteria such as *Escherichia coli* (*E. coli*)
- chemical—78 different chemicals such as arsenic, lead, and mercury
- radiological—78 substances such as radium and uranium
- physical—features such as temperature and alkalinity (pH or acidity level)
- aesthetic—several different attributes including taste, odour, and clarity

Tests are carried out to determine if the levels of contaminants exceed Ontario's drinking-water-quality standards. Certified operators working at OCWA-managed facilities collect samples and send them for testing to accredited laboratories licensed by the Ministry. The turnaround time for *E. coli* testing is about two days, whereas more complex testing can take up to two weeks.

We reviewed three months of water-quality tests for 15 drinking-water facilities to ensure that samples were collected and tested in accordance with legislated requirements. We found that water samples were taken in accordance with regulations, with the exception of minor discrepancies. We were

Detailed Audit Observations

DRINKING-WATER AND WASTEWATER TESTING

Drinking-water Testing

The *Safe Drinking Water Act, 2002* governs the operation and maintenance of drinking-water systems and was enacted in response to the report of the Walkerton inquiry, which made recommendations to ensure the safety of the water supply in Ontario. The Act provides for the protection of human health and the prevention of drinking-water health hazards through the control and regulation

informed that no adverse effects resulted from any of the minor discrepancies noted. We also found that OCWA was using licensed laboratories to analyze all drinking-water samples tested. No problems were noted with the turnaround times for receiving test results.

Although we did not note any major problems in our review of OCWA's drinking-water testing, any non-compliance could have serious consequences. Therefore, the Ministry collects data on all municipal residential drinking-water systems. We assessed the performance of OCWA-operated facilities against the performance of those operated by other entities such as in-house municipal systems and private-sector service providers. On the basis of information provided by Ontario's Chief Drinking Water Inspector, we noted that 99.6% of OCWA drinking-water samples tested met legislated standards for quality, which is slightly less than the average of 99.9% for all other drinking-water systems operated either directly by municipalities or by private sector operators. On a positive note, OCWA had fewer microbiological exceedances, which historically have been the biggest threat to human health.

Adverse Drinking-water-quality Incidents

As Figure 2 shows, there were more incidents per facility where contaminants and other non-compliance attributes did not meet water-quality

standards at OCWA's 173 drinking-water treatment facilities than at the other 534 facilities in the industry. However, most drinking water contaminants are present in the source water that is supplied to the treatment plant. Removal of contaminants to prevent adverse water-quality incidents is related not only to the proper implementation of operational procedures but also to the design of the treatment plant. The operator often has limited control over the quality of the source water or the capacity of the treatment plant to remove adverse attributes. We were informed that the operator can exercise the most control over microbiological exceedances since procedures and treatment plants are designed to identify and treat such incidents. In contrast, chemical, radiological, and physical and aesthetic exceedances can result from treatment plants that do not have the technological capability to remove such attributes.

Contaminants in drinking water can pose a serious risk to human health. Therefore, a timely response for corrective action is required. The Ministry has established a notification protocol that all system owners and operators must adhere to when they discover any indicators of adverse drinking-water quality: laboratories and drinking-water system owners/operators must immediately notify the Ministry's Spills Action Centre and the local Medical Officer of Health and outline the actions taken to correct the situation. This is to be followed up with written or electronic notification within

Figure 2: Exceedances in Drinking-water Quality Standards, 2006/07 Fiscal Year

Source of data: Ministry of the Environment

Category	# of Incidents		Incidents per Facility	
	OCWA (173 Facilities)	Other (534 Facilities)	OCWA	Other
microbiological	145	530	0.838	0.993
chemical	97	175	0.561	0.328
radiological	0	1	0.000	0.001
physical/aesthetic*	570	1,055	3.295	1.976
Total	812	1,761	4.693	3.298

* Aesthetic exceedances do not have to be reported to the Ministry unless they pose a risk to human health. For example, a high sodium content may be harmful to some people.

24 hours. Finally, within seven days after the issue has been resolved, a written notice summarizing the action taken and the results achieved is to be provided to the Spills Action Centre and the local Medical Officer of Health.

We followed up on all adverse results occurring in the three-month period we reviewed for 15 OCWA-operated drinking-water facilities and noted that in all instances OCWA had followed the notification protocol set by the Ministry. OCWA had established procedures and training to ensure that operators understand and follow the Ministry's notification protocols. In addition, we found that OCWA had put disciplinary measures in place to deal with employees identified as failing to take samples or send samples to the lab, or failing to record the proper sampling times. As demonstrated by the incident in Walkerton, which had a municipally operated system, such firm actions are necessary given the potential consequences of adverse water-quality incidents.

OCWA is required to produce drinking-water-system annual reports for facility owners, which are usually municipalities. Reports must include details of water-quality sampling for that year, including the number of samples taken and test results. During our review, we noted errors in the reported number of samples tested in two of the 15 municipal annual reports reviewed. It is important that information in the annual reports be accurate, since facility owners may use these reports for decision-making purposes and they must be made available to the public.

Monitoring of Drinking-water-quality Testing

Each hub office has one or more compliance technicians who monitor water-quality testing to ensure that all required samples are taken properly and sent to the lab for testing, and that prompt action is taken to deal with any adverse test results. However, there are no standard policies or procedures for technicians to follow to track and monitor sampling activity. The practices followed varied among

hub offices and also within hub offices that had more than one technician.

Although there are no corporate guidelines in place, some offices developed very good monitoring practices. We saw technicians who prepared a customized sampling schedule for each facility and updated the schedule for applicable changes in regulations and guidelines. Each time an operator was required to take a sample, the technician forwarded a "chain of custody document" to the operator specifying how that sample was to be taken. After the sample was taken, the operator would sign the document and send the sample and the document to the lab. The operator would also send a copy of the signed document to the technician as evidence that the sample had been taken. Some technicians maintained their own control logs to check off when testing documents were received from operators and test results received from the labs. Other compliance technicians only logged test results on a spreadsheet and at the end of the month assessed whether all samples had been taken.

Many labs transmit their test results electronically to OCWA's management information system, while other labs send them manually for OCWA staff to enter into the system. Technicians are responsible for reviewing the lab results in the management information system for accuracy and then "locking" the results at the end of the month to ensure that results cannot be altered. At each of the hub offices we visited, every one of the facilities we reviewed had not locked lab results into the system for at least one month in 2007. For several facilities, lab results had not been locked in for the entire year.

RECOMMENDATION 1

To help further reduce the risk of drinking-water health hazards, OCWA should:

- formally review adverse water-quality incidents to determine whether there are any systematic issues necessitating changes to its operating procedures;

- improve procedures to help ensure the accuracy of data presented in annual reports to system owners and the public;
- utilize the best practices developed by local offices to standardize policies and procedures for compliance technicians to follow when tracking and monitoring drinking-water samples tested; and
- ensure that lab results are locked into the system on a monthly basis, as currently required.

OCWA RESPONSE

OCWA appreciates the Auditor General's comments with respect to reporting on water-quality incidents and microbiological exceedances, which have historically posed the biggest threat to human health and over which the operator has the most control. With respect to microbiological exceedances, OCWA outperformed the rest of the industry. Successful treatment of other attributes that may be present in source water is largely dependent on facility design and is therefore often not within the control of the operator.

OCWA has recently initiated a process to review and enhance its reporting to identify any systemic issues that may exist, to ensure that best practices are communicated throughout OCWA, and to better support senior management and the Board of Directors in exercising appropriate oversight over OCWA operations.

Wastewater Testing

The *Ontario Water Resources Act* governs the operation and maintenance of wastewater systems. Unlike drinking-water systems, wastewater systems are not subject to any water-quality testing requirements. The requirements for testing the quality of the wastewater, as well as for the frequency of sampling and the discharge limits for specific substances, are

outlined in a Certificate of Approval issued by the Ministry for each facility. This certificate imposes a legal requirement on the facility to comply with its requirements or other ministry guidelines.

The Certificate of Approval lists acceptable levels of contaminants in the treated water leaving the sewage plant. These levels may be specified as a daily limit, a monthly average concentration, or a yearly average concentration. The limits are unique to each facility according to its design. If a facility does not have a Certificate of Approval, then ministry guidelines on wastewater treatment, sampling, and analysis are applicable. Samples for testing are generally taken from the point where the raw sewage enters the facility and the point where the treated sewage (final effluent) is discharged into a receiving body of water such as a lake or river.

We reviewed three months of water-quality tests for 15 wastewater facilities to ensure that samples were collected and tested in accordance with applicable requirements. In general, we found that wastewater samples were taken in accordance with guidelines or Certificates of Approval. In addition, OCWA was using licensed laboratories to test wastewater samples, even though it is not required to do so. There were no problems with the turnaround times for receiving test results.

An adverse test result for wastewater is the presence of a contaminant in the final effluent that exceeds the limit set out in a facility's Certificate of Approval. The procedures to be followed when this occurs are documented in each certificate and are relatively consistent from one certificate to the next. OCWA is required to provide verbal notification to the Ministry as soon as possible, and in writing within seven days of the event. We reviewed a sample of adverse test results at the 15 facilities we tested and found that all incidents were eventually reported, but a number of results were not reported on a timely basis as required by the applicable Certificate of Approval.

To monitor wastewater discharges that are out of compliance with the legal limit specified in a Certificate of Approval or guidelines, the Ministry

requires the reporting of all out-of-compliance discharges as well as wastewater bypasses and overflows. A bypass is the diversion of sewage from the treatment process and its discharge into the environment without being fully treated. An overflow most often occurs during periods of higher than normal rainfall, when the amount of wastewater that flows through a treatment facility exceeds the maximum amount of water that the plant was designed to handle. As shown in Figure 3, for the 2006/07 fiscal year, OCWA's 163 facilities overall experienced fewer bypasses, overflows, and discharge exceedances on average than the other 296 facilities in the industry.

We selected a few types of incidents such as bypasses and discharge exceedances and followed up with facility managers for an explanation of the causes of the incidents, as listed in Figure 4. The managers noted the following reasons for such incidents:

- Wet weather was the cause of many of the bypasses. Some municipalities still have collection systems that carry both sewage and rainwater. In this case, the entire flow goes to a wastewater treatment plant. During storms or snowmelts, the volume of water entering a treatment plant may exceed the plant's capacity. As a result, certain treatment processes within a plant may be bypassed to avoid damage to the facility and personal property (for example, when sewage backups cause basement flooding), and the water is released

into the environment untreated or partially treated. When there are separate pipes for storm water and sewage waste, storm water goes directly to the receiving body of water and only sewage water goes to the treatment plant.

- We were advised that the age of facilities was also a common reason for non-compliance. According to operations managers, about one-third of the facilities where age had been cited as the cause of an incident had been recently upgraded or were in the process of being upgraded. There were no plans to upgrade the remaining facilities in the near future. However, operations managers produced documentation showing that they had notified the owners regarding the state of the facilities.

We were told that the main reason for not upgrading water collection systems and aging facilities was a lack of funding. In many cases, those systems serve small municipalities that find the cost of building a new system or facility or upgrading old ones too high. In these circumstances, infrastructure loans or funding may be necessary to finance such major projects.

Biosolid Testing and Dispersal

Wastewater facilities produce treated sewage water—which is discharged into nearby waterways—and sewage biosolids. Sewage biosolids are disposed of through landfill or incineration, or are further processed for application to farmland as

Figure 3: Adverse Wastewater Incidents, 2006/07 Fiscal Year

Source of data: Ministry of the Environment

Type	# of Incidents		Incidents per Facility	
	OCWA (163 Facilities)	Other (296 Facilities)	OCWA	Other
bypasses reported to MOE*	253	757	1.55	2.56
overflows reported to MOE*	111	423	0.68	1.43
discharge exceedances	126	291	0.77	0.98
Total	490	1,471	3.01	4.97

* MOE: Ministry of the Environment

Figure 4: Reasons Cited for Non-compliance Incidents

Source of data: OCWA

Reason Cited	% of Incidents
combined storm and wastewater sewers	45
age of facility	35
suspected data entry errors	10
other	10

fertilizer. The land application of biosolids is regulated under the province's *Nutrient Management Act, 2002*. It is the responsibility of the wastewater facility owner or the operating authority (OCWA) to ensure the safe and adequate final disposal of wastes generated at their facilities.

Biosolids make good fertilizer, but they contain fecal coliform and other bacteria. Consequently, biosolids can only be applied up to a certain capacity to farm sites approved through a Certificate of Approval issued by the Ministry. Application in excess of capacity could cause significant environmental damage through groundwater contamination and runoff into nearby rivers and lakes. Ministry guidelines require sewage treatment plants to maintain records that include the amount of biosolids applied to each field. To prevent environmental damage, biosolids intended for land application must be tested for the presence of 11 different substances, including arsenic, lead, and mercury. Testing on samples should be performed twice a month while the biosolids are being applied and for the two months preceding application.

We reviewed the handling of biosolids at a sample of OCWA-operated wastewater facilities. We found that all farm sites where the biosolids were applied had a Certificate of Approval issued by the Ministry, the frequency of biosolid sampling was appropriate, and the metal content tested within acceptable limits. However, biosolid haulage records were incomplete for several of the facilities tested. For example, some daily records could not be located, haulage records had not been fully

signed off, and insufficient information was available to determine if the amount of biosolids applied to each site was within the capacity specified in the Certificate of Approval.

RECOMMENDATION 2

To help protect the environment from the effects of untreated or partially treated wastewater and biosolids, OCWA should:

- identify the causes of all incidents of discharge exceedances, bypasses, and overflows to determine if there are any operational measures that could be taken to reduce such incidents;
- periodically report to the senior management committee and the Board of Directors on the details of the incidents and what potential actions OCWA could take to help correct the situations identified; and
- develop standard policies and procedures to ensure that the amount of biosolid material removed from its facilities is accurately recorded and applied to land within the amounts specified in the sites' Certificates of Approval.

OCWA RESPONSE

OCWA accepts the Auditor General's recommendation. OCWA regards its role as an operator of wastewater systems as an important one and approaches the operation and maintenance of these facilities with a keen understanding of the design of the facilities and an appreciation for the different operational challenges and threats that may result from environmental conditions or circumstances that develop over time. OCWA works with the owner and reports to the regulator on bypasses and operational exceedances, particularly where infrastructure is a factor. In operating wastewater systems, OCWA has procedures in place to help ensure compliance with the requirements set out in regulations, guidelines, and

Certificates of Approval that include processes for bypasses and discharges.

OCWA continues to make progress on addressing the new regulatory framework for nutrient management. We are moving forward, in partnership with our municipal clients, with strategies to address biosolids from medium and small wastewater treatment plants, and to improve the existing monitoring tools, training, and procedures to ensure that biosolids applied to land are within regulatory limits.

FACILITY MONITORING AND COMPLIANCE

Facility Assessment Reviews

Compliance with regulatory and corporate requirements is monitored internally by OCWA through its Facility Assessment Reviews (FARs). These self-assessments are performed annually at each facility by the local operations manager or a designate, usually the compliance technician. FARs are intended to identify areas of concern and opportunities for improvement at the facilities OCWA operates. Where deficiencies are identified within a facility, the required actions to resolve the problem are recorded. Figure 5 presents statistics on FARs for the last four years.

Approximately 2,000 required actions are noted every year to address violations identified during the reviews. Although many of the 2007 reviews may have been done in the latter part of the calendar year, as of mid-March 2008, OCWA's management system noted that 1,471, or 68%, of the problems from 2007 had still not been addressed. Since the majority of 2007 problems were still outstanding at the time of our audit, we reviewed the 2006 results in more detail and noted that the average time taken to correct problems from the time they were first identified was seven months.

According to OCWA annual statistics, the most common deficiencies for 2007 were in the areas of

Figure 5: Facility Assessment Reviews, 2004–2007

Source of data: OCWA

	2004	2005	2006	2007
assessments completed	426	420	410	403
problems identified	2,411	1,721	2,095	2,173
problems recorded as rectified	2,411	1,721	2,095	702
problems outstanding	0	0	0	1,471
% of Issues Not Addressed	0	0	0	68

Note: data as of March 2008

health and safety, facility emergency planning, and hazardous materials. Deficiencies were also noted in equipment inspections and testing, chemical dosage measurement, and drinking-water-systems regulation. Although required actions are given a priority rating, these annual statistics give no indication of the severity of the concern; as a result, it is unclear whether the deficiency poses a risk to public health or whether it is an administrative matter, such as failure to complete the proper paperwork. Without such information, it is difficult for senior management to assess facility performance and to determine whether problems, especially the more serious ones, are corrected within a reasonable length of time. For instance, while seven months may be acceptable for minor problems, it would be unacceptable for significant issues.

In order to determine whether the same facilities were responsible for similar non-compliance issues year after year, we selected a sample of facilities that had had a more comprehensive audit done in either 2006 or 2007 and compared those results with results from FARs for the last five years. For most of the facilities tested, about one-quarter of all non-compliance issues raised had been identified previously. However, it is not possible to determine if the problems reappeared after having been corrected or if, rather than actually being corrected, were simply carried forward in the next year's review. Nevertheless, the trend suggests that more attention needs to be paid, at the facility level, to

identify and correct recurring problems. As well, this is another area where we feel summary reporting to the senior management committee and the Board of Directors would be useful.

OCWA Compliance Audits

Compliance audits, which cover the same areas as FARs but are more comprehensive, are performed on a sample of facilities by staff from OCWA's Risk, Compliance and Training Division. Local operations and regional managers are responsible for correcting by the established deadlines the deficiencies that the audits identify. Figure 6 shows the number and status of compliance audits done over the last four years.

While this is a good quality assurance process, we noted that as of March 2008, over 90% of deficiencies noted in 2007 had not yet been addressed. Also, a substantial number of issues were outstanding from earlier years. Even though regional managers informed us that they regularly review status reports on compliance audits, the number of outstanding items recorded in the system suggests that more comprehensive oversight and follow-up are required to ensure that deficiencies are corrected.

OCWA has established a methodology for selecting facilities for compliance audits. According to OCWA policy, half of the selections are made by regional managers using a risk matrix that considers factors, such as the number of people served by a facility and the facility's previous compliance record. The risk matrix must be scored and docu-

mented for each facility, and the highest-scoring facilities should be selected for audit. The other half are selected by the Director of the Risk, Compliance and Training Division with input from corporate office. The rationale for selecting them must also be documented; typically, it considers factors such as staffing changes and the age of the facility. We reviewed the actual selection process used in 2006 and 2007 and noted the following:

- There was no documented justification for the number of facilities selected for audit in total or for each region. During the last four years, the total number of audits has ranged from 29 to nine in 2007. According to OCWA, the number of compliance audits done depends on the availability of resources. In 2007, we were informed that compliance staff performed a significant amount of work in areas other than compliance auditing. Nevertheless, the low number of nine audits performed in 2007 may not be sufficient to make the process effective.
- The risk matrix assessments were not completed as required. They were completed by only one of the five regions in 2006 and by two regions in 2007. Where the risk matrix was completed, the scores given were not always assigned in accordance with the established scoring method, and the facilities rated as the highest risks were not always selected for audit. For example, in one region, 33 facilities scored higher, and were assessed as greater risks, than a facility selected for audit. There was no documentation on file to justify the selection of this facility as opposed to the facilities ranked as a greater risk.
- The original target dates set to correct problems noted during compliance audits are not being adhered to. Since 94% of deficiencies noted in audits completed in 2007 were still outstanding at the time of our audit, we reviewed the 2006 results. The average target date set to address deficiencies was four months. However, we noted that, in the cases

Figure 6: Compliance Audits, 2004–2007

Source of data: OCWA

	2004	2005	2006	2007
Audits	29	26	21	9
Issues Identified	664	343	221	85
issues addressed	578	254	158	5
issues outstanding	86	89	63	80
% of Issues Not Addressed	13	26	29	94

Note: data as of March 2008

where deficiencies noted in 2006 compliance audits were corrected, it took an average of eight months to do so.

Ministry Inspections

The Ministry of the Environment inspects drinking-water systems every year and wastewater systems every three years. An inspection follows a standard protocol to verify that the facility is in compliance with the applicable legislation. The ministry inspector visits the facility and assesses the effectiveness of the treatment, checks the system's monitoring procedures, performs limited water sampling, verifies staff certification, and evaluates overall operational practices. An inspection report is subsequently issued that may result in provincial officer's orders for significant issues of non-compliance or a report detailing required actions for deficiencies of lesser severity. A provincial officer's order may note more than one compliance issue. Figure 7 presents statistics on ministry inspections of OCWA-operated facilities. Since a portion of the system may not be OCWA's responsibility (for example, where OCWA runs the treatment facility but not the distribution system), only results for which OCWA has either sole or joint responsibility are included.

Overall, a significant number of non-compliance issues that required action have been noted at OCWA-operated facilities. Non-compliance issues were found in over half of the facilities inspected. On a positive note, the trend over the last four

years is a decline in the most serious issues, which are noted in provincial officer's orders. However, although OCWA has made progress in reducing the most significant concerns, OCWA-operated facilities received over half the orders issued, as shown in Figure 8.

We analyzed the time taken to address non-compliance issues identified in ministry inspection reports for a sample of inspections conducted in 2006 and 2007, and noted that for issues that were the sole responsibility of the operator, only about half had been resolved by the compliance date set by the Ministry. The average time taken to correct problems from the time OCWA received the inspection report was over three months, and at the time of our audit some actions required by inspections made in 2006 had yet to be resolved.

OCWA enters data from ministry inspection reports into its compliance information management system. However, ministry inspection reports often do not indicate which section of the legislation or regulation has been violated. Consequently, OCWA staff interpret the inspection reports and summarize the issues themselves. As a result, OCWA has developed its own categories for classifying non-compliance issues. However, we found that the categories were often too broad to provide useful information on the type and seriousness of issues. Such information could provide senior management with useful reports that could be used to monitor compliance and ensure that facility staff correct deficiencies in a timely manner.

Figure 7: Drinking-water and Wastewater Facility Inspections, 2004–2007

Source of data: OCWA

Calendar Year	# of Ministry Inspections	# of Non-compliance Issues Noted in Provincial Officer's Orders	# of Additional Non-compliance Issues Noted in Ministry Inspection Reports	Total # of Non-compliance Issues
2004	259	125	94	219
2005	206	72	289	361
2006	211	25	323	348
2007*	192	27	260	287

* Does not include the results of 10 inspections that year because OCWA had not yet received those inspection reports.

Figure 8: Provincial Officer's Orders Issued at OCWA-operated and All Other Facilities, 2006/07 Fiscal Year

Source of data: Ministry of the Environment

	OCWA-operated Facilities	All Other Facilities
# of inspections conducted	238	669
# of provincial officer's orders issued	21	17
% of inspections conducted	26.2	73.8
% of provincial officer's orders issued	55.3	44.7

RECOMMENDATION 3

To help ensure compliance with environmental, health, and safety requirements and to ensure that the significant and recurring problems identified are promptly corrected, OCWA should:

- review its compliance audit process to make sure that a sufficient number of facilities are selected for audit, and that those facilities rated as the highest risk are selected, or document the justification for any alternative selection;
- rank and/or record deficiencies noted in facility assessment reviews, compliance audits, and ministry inspections by type and significance to ensure that the most serious problems are dealt with expediently;
- assess the cause of recurring problems and consider means, such as additional staff training, to help prevent their recurrence; and
- prepare ongoing reports for the senior management committee and the Board of Directors, outlining the frequency, type, and severity of issues raised and the status of corrective actions.

OCWA RESPONSE

OCWA thanks the Auditor General for his comments in the area of Facility Assessment Reviews

(a voluntary, proactive program), compliance audits, and ministry inspections. In order to further improve the value of these programs, we have introduced a more rigorous, risk-based approach to the selection of facilities for compliance audits and to ensure that problems identified in the audits are corrected on a timely basis.

OCWA will continue to work with our municipal clients to prioritize and respond in a timely manner to any non-compliances identified, to identify the root cause of recurring issues, and to develop action plans for responding accordingly. Existing reporting to senior management and the board has been enhanced to capture and report more detail related to the frequency, type, and severity of issues raised and status of corrective actions identified.

FACILITY MAINTENANCE AND REPAIRS

Many of the 500 drinking-water and wastewater facilities operated by OCWA were at one time owned by the Ministry of the Environment and subsequently by OCWA. In 1997, the province transferred ownership of these facilities to the municipalities. Some were old and in need of significant upgrades, and others had problems that require significant financial investment to repair. Since much of the continuous monitoring of drinking water and wastewater is automated, it is important that facilities and equipment be properly maintained to provide accurate readings and warn operators of potential water-quality problems. If assets are not properly maintained, water quality may be jeopardized. Both the municipality and OCWA could be held responsible for the human costs of such events or any damage to the environment.

According to standard customer contracts, OCWA is required to record information on adverse water-quality incidents, the frequency of equipment breakdowns, and repair costs. Data on major pieces of equipment are entered into OCWA's maintenance

management systems. Schedules or work orders are prepared monthly by facility for each piece of equipment listed in the system. These schedules are distributed to the appropriate operators, who are required to conduct monthly preventative maintenance checks. Such maintenance is necessary to demonstrate that equipment has been maintained in accordance with manufacturer's standards.

We reviewed a sample of maintenance work orders and found that equipment maintenance was often not performed as required. Specifically:

- Only one-third of the maintenance work orders sampled had evidence that preventative maintenance work was completed as scheduled. For the remaining work orders, maintenance was performed late or, for at least one month in the year, there was no evidence that maintenance had been done. For example, an ultraviolet light used to disinfect wastewater had no evidence of testing for nine out of 12 months in 2007. We were informed that operators may perform maintenance work, record it manually, and input it into the system at a later date. However, this precludes management follow-up to ensure the timely completion of required maintenance.
- The maintenance system reported that for 2007, one hub had over 1,100 incomplete and 130 outstanding work orders. Three facilities out of the 538 that OCWA operates accounted for over half of the work orders returned incomplete. We were informed that some work orders may not be applicable and staff are not able to delete them from the system. In such situations, management should follow up to determine the cause of so many outstanding work orders and rectify the situation.
- We found a number of examples where two or more monthly maintenance work orders were signed off in the same month for the same piece of equipment. For example, the maintenance work orders for an alarm for the months of March to September were all signed off in October. At another facility, the

operator told us that he does a visual check daily and that he sometimes signs off work orders for multiple months all at once due to time constraints. This provides no assurance that maintenance was done as required.

- The maintenance management system for one region does not identify individual pieces of equipment. Consequently, the preventive maintenance work order lists areas in the facility that need to be checked. This does not provide any assurance that all of the equipment in the area is maintained as required.
- Repairs to equipment are documented using corrective work orders. Ten facilities accounted for half of all corrective work orders issued in 2007. We were informed that the reason for the high incidence of required repairs was breakdowns that were due primarily to the age of the facilities and poor plant design. We also noted that 10% of corrective work orders issued in 2007 were entered without the organization unit number that is used to identify a facility. If this information is missing, OCWA cannot do a complete analysis to highlight facilities that may need extensive capital upgrades.

We also found a number of best practices used by various hub offices to help ensure that work orders are completed as required: for example, one hub had a policy that all work orders were to be completed and returned by the 10th of the month, and one office held a special training session for its operators to emphasize the importance of, and the proper procedures for, completing work orders.

RECOMMENDATION 4

To ensure that facilities and equipment are maintained in good working order, OCWA should develop a quality-assurance process to verify periodically that regularly scheduled maintenance is completed and documented as required.

OCWA RESPONSE

We acknowledge the Auditor General's comments regarding the shortfalls in the documentation of maintenance work completed by our staff. We have introduced improvements to the reporting of outstanding work orders. These reports are used to support the operations committee and decisions made by the senior management committee and ensure that all hubs are meeting goals and objectives with respect to scheduled maintenance activities. In this regard, OCWA's work management system is a continuously evolving system that is changed as new legislative or regulatory requirements are introduced.

In order to further improve the tracking of maintenance work, we will review all work orders and undertake an assessment of the applicability of each one, using a risk-based approach, and eliminate any work orders that are not applicable to the particular facility.

STAFF CERTIFICATION, LICENSING, AND TRAINING

Staff Certification and Licensing

The licensing and certification requirements in the regulations to the *Safe Drinking Water Act* and the *Ontario Water Resources Act* help to ensure that facilities are operated by knowledgeable and experienced staff. Operators of drinking-water systems must be certified, and operators of wastewater systems must be licensed. Operators are required to renew their certificates and/or licences every three years.

Each type and level of subsystem has a certificate or licence. There are generally two types of drinking-water subsystems—treatment plants and distribution systems; and there are two types of wastewater subsystems—treatment plants and collection systems. Each type of subsystem is classified

on a scale from level one to four, four being the highest level, according to operational complexity and population served. Operators are normally required to have more than one type of certificate and/or licence, since they generally work in more than one type and level of facility.

We assessed whether facilities were staffed with operators holding valid certificates or licences for the type and level of the facility operated. OCWA maintained a list of operators and the certificates and licences they held, but this list did not include the names of all the facilities they operated. Therefore, we reviewed licences and certificates in the four areas we visited, which operated 90 facilities and had a total of 112 operators, to determine if all operators held the proper type and level of certificate and/or licence for the facilities they operated. We had the following observations:

- Over 10% of operators working on site at facilities were not listed as having the certificate or licence required for the type of subsystem they operated. For example, four operators working in a water treatment plant were listed as having expired drinking-water treatment-facility operator's certificates. Although we were subsequently provided with evidence that these operators held valid certificates, in other such situations, staff are assigned to non-operational duties, which is not a fully productive use of staff.
- OCWA noted that it is difficult to find qualified operators and that operators tend to maintain the minimum level of certification or licence required (that is, from level one to four). OCWA has adjusted its compensation structure to encourage operators to upgrade their skills by offering higher wages (10 to 50 cents more per hour) for higher certification levels. This has resulted in an increase in the overall licence and/or certification levels of staff. Additional compensation or other incentives may be necessary to maintain this trend.
- The regulations require that at least one operator hold a certificate and/or licence

of the same level (one to four) as the level of the facility. In order to comply with the regulations, each facility is assigned an overall responsible operator (ORO) who has the appropriate level of certification and/or licence. We found situations where the designated ORO may not have been the best alternative. For example, in a hub with two level-three water distribution systems, an employee from another office with a level three certificate was designated as the ORO. The ORO can be off site but must be able to respond immediately and effectively to an emergency. It might be difficult for this ORO to fulfill his duties should an emergency arise, especially since this person worked in an office two hours away by road, was not required to visit the facilities, and did not receive reports on the facilities.

Staff Training

All drinking-water and wastewater operators are required to complete a minimum number of hours of training each year in order to meet regulatory requirements. By agreement with system owners or by regulation, OCWA is responsible for ensuring that every operator completes the required number of training hours. As a condition of certificate renewal, drinking-water-system operators are required to have an average of between 20 and 50 hours of training annually over a three-year period, depending on the complexity of the systems they operate. Wastewater-system operators are required to attend 40 hours of annual training, regardless of the type or class of licence they hold.

The type of training for wastewater operators is not specified in regulation, but drinking-water-system operators must have a minimum number of hours of approved training related to drinking water and may accumulate on-the-job training hours in areas such as equipment demonstration and safety training. The province's requirements are less stringent than the requirements of British

Columbia and Alberta, which specify relevant training hours for both water and wastewater operators and require that training be completed before certificate or licence renewal for all types of operators.

Overall, we found that the management information system available to senior management to track whether certified and licensed operators were completing the required hours of training was inadequate. Specifically:

- The system generates a report by region that highlights the number of employees who have not achieved 40 hours of training. (For 2007, 22% of OCWA's operations employees had not received 40 hours of training.) The report is inadequate for monitoring purposes because it does not reflect the fact that drinking-water-system operators need between 20 and 50 hours of training, depending on their certificate, and the fact that the hours are to be averaged over a three-year period. Furthermore, the system records all training hours reported and does not distinguish those hours that are relevant for certification or licensing purposes.
- We found that management monitoring of training hours had a direct impact on whether the staff regularly received training. In one hub where there was evidence that training hours were properly tracked, about 80% of the operators had completed sufficient training hours for 2007 to consistently accumulate the training hours required to renew their certificates and/or licences. In another hub office where there was no evidence of any tracking by hub staff, operators were not regularly receiving training hours. Consequently, these operators may have to accumulate a significant number of training hours in the third year in order to renew their certificates and/or licences. As well, the intent of the training requirement is to ensure that operators continuously upgrade their knowledge.
- With a few exceptions, training records at the three hub offices we visited were generally

entered correctly into the system. However, practices for completing and entering training records varied widely among the three hubs we visited. At one hub, all training for the sample selected was properly supported by training records signed by both the operator and the hub manager. At another hub, many training records could not be located. At the third hub, training records were prepared only for courses provided internally at the hub.

RECOMMENDATION 5

To help ensure that staff have the educational and experience requirements necessary to maintain their certificates and licences, OCWA should:

- include on its list of operators and the certificates and/or licences they hold the level and type of all facilities they operate to help management ensure that operators have the appropriate type of certificate and/or licence for the facilities they work at;
- consider implementing additional incentives to encourage operators to upgrade their qualifications at least to the level of the facilities they work at;
- ensure that only staff who can respond immediately and effectively to emergency situations are appointed as overall responsible operators, in accordance with regulatory requirements; and
- assess best practices throughout the organization to help develop corporate policies and procedures for recording, approving, and storing training records, as well as procedures to ensure that staff are completing the required number of training hours on a consistent basis.

OCWA RESPONSE

OCWA acknowledges the Auditor General's recommendations in this section. OCWA adheres

strictly to all regulatory requirements established by the Ontario government regarding training, certification, and designation as the Overall Responsible Operator (ORO). Failure of an operator to meet these requirements would result in our removing the individual from operational duties on a short-term basis until the situation is resolved.

OCWA is introducing changes to its existing training database to ensure that reports capture all licence renewals on a timely basis and to better assist managers in monitoring staff training and certification/licensing to ensure that all operators continue to comply with the revised training requirements.

REVENUE GENERATION

Full Cost Recovery

According to the *Capital Investment Plan Act*, under which OCWA was created, one of its objectives is to provide services to the water and wastewater sector on a cost-recovery basis. According to its *2007 Annual Report*, when financing income is added to its loss on operations, OCWA has achieved full cost recovery. However, an analysis of OCWA's financial results shows that, although OCWA has made \$10.6 million over the last 10 years, it has experienced a loss on the operations side of its business for eight of the last 10 years. In effect, OCWA has subsidized its clients for more than \$50 million in the last 10 years. As Figure 9 demonstrates, any overall net income is due primarily to interest income earned from financing activities.

OCWA's financing activities, as of December 31, 2007, consisted of 47 long-term loans to 29 different clients, for a total principal amount of approximately \$150 million. Many of these loans were inherited from the Ministry at the inception of OCWA in 1995. However, since 2003, when the Ontario Municipal Economic Infrastructure Financing Authority began providing low-interest loans

Figure 9: Ten-year Income Summary (\$ thousand)

Source of data: OCWA

Calendar Year	Income (Loss) from Operations	Income from Financing Activity	One-time Revenue (Expenses)	Net Income (Loss)
1998	3,060	14,073	(2,016)	15,117
1999	2,767	11,416	(3,743)	10,440
2000	(11,377)	11,201	(550)	(726)
2001	(10,035)	8,951	(740)	(1,824)
2002	(9,972)	6,616	(20)	(3,376)
2003	(9,463)	7,404	(7)	(2,066)
2004	(5,574)	6,532	900	1,858
2005	(6,867)	7,046	(18,627)*	(18,448)
2006	(3,809)	6,993	(50)	3,134
2007	(1,253)	7,865	(55)	6,557
Total	(52,523)	88,097	(24,908)	10,666

* provision for losses on its loan portfolio

to support municipal infrastructure, OCWA has not provided any new loan financing. We reviewed the interest payments on these loans and found that, with one exception, monthly payments were being made as scheduled. For this one exception, OCWA has made the provision for loan losses, as noted on Figure 9.

Although OCWA has experienced a loss from its operations in the last eight years, the overall trend is a steady decrease in the amount of the loss. For instance, over the last five years, OCWA's expenses have increased only 2.8% annually on average, and OCWA has gradually reduced its operating deficit from \$9.5 million to \$1.3 million. If this trend continues, OCWA may achieve full cost recovery from its operations in 2008. In order to do so, OCWA will have to increase revenues and/or decrease costs. Facility operations and associated capital billings account for 98% of OCWA operating revenues, as can be seen from Figure 10.

It has been difficult for OCWA to increase operating revenue through new municipal service contracts. According to OCWA's 2008–2010 business plan, most Ontario municipalities that run their own water systems are not interested in exploring

other options. Existing clients are looking for a way to lower their costs and are going out for competitive tenders or assuming direct control of their operations.

Over the last five years, OCWA has lost 56 contracts with annual revenue of \$10.2 million. Most of these contracts were lost either to private sector competitors or to municipalities that assumed responsibility for their own facilities. At the same time, OCWA gained 88 new contracts that provide annual revenue of \$12.3 million, for a net gain of \$2.1 million in revenue each year. Most new business in 2007 (\$3.4 million) related to oversight services to First Nations communities to supervise, assist, and train operators in the operation and maintenance of their water treatment systems. Of the contracts renewed in 2007, 66% were renegotiated with a lower contract margin, which means that the percentage of revenue available to cover overhead costs was less than before.

Direct operating costs for utility operations have increased by 12% over the last five years. As Figure 11 demonstrates, over this time period, OCWA has limited its expenses to an average increase of 2.8% annually.

Figure 10: Sources of Operating Revenues, 2006 and 2007

Source of data: OCWA

	2006		2007	
	(\$ 000)	%	(\$ 000)	%
facility operations—basic contracts	84,345	74.8	88,480	72.3
facility operations—capital billings	25,829	22.9	31,493	25.7
project management/engineering services	2,177	1.9	1,698	1.5
training	457	0.4	630	0.5
Total	112,808	100.0	122,301	100.0

Figure 11: Increase in Operating Expenses, 2003–2007

Source of data: OCWA

	2003	2004	2005	2006	2007	Overall Increase	Avg. Annual Increase
	(\$ 000)	(\$ 000)	(\$ 000)	(\$ 000)	(\$ 000)	(Decrease) (%)	(Decrease) (%)
salaries and benefits	44,506	47,186	48,361	49,426	50,948	14.5	3.4
other operating expenses	61,003	60,806	62,143	65,518	70,956	16.3	3.8
amortization of fixed assets	2,095	1,783	1,739	1,673	1,650	(21.2)	(5.8)
electronic operating systems	1,700	845	656	0	0	(100.0)	–
fixed asset write-off	1,198	0	0	0	0	(100.0)	–
Total	110,502	110,620	112,899	116,617	123,554	11.8	2.8

Although OCWA does not negotiate the costs of salaries or wages paid to employees because its employees are Ontario public servants, it does control the number of staff it employs. However, according to its latest business plan, OCWA is experiencing difficulty attracting appropriately licensed operators. Therefore, costs related to operating staff are not an area where it anticipates achieving savings. So to help control expenses and reduce exposure to market volatility, OCWA has increasingly negotiated multi-year agreements for supplies such as chemicals, laboratory services, and telecommunications.

In 2006, OCWA commissioned a consulting firm to provide a business case for achieving cost savings. The report, referred to as the revitalization initiative, made a number of recommendations for streamlining various functions to help achieve annual savings of \$4.2 million with a one-time cost of \$2.8 million.

The consultant's recommendations were presented to the Board in September 2006 and approved for implementation. At the time of our audit, we were informed that the revitalization project had been delayed pending the implementation of a new financial accounting system. According to senior management, OCWA has made some changes to its operations in an effort to save money. OCWA estimates that staffing changes since 2005 have achieved \$1.37 million in annual savings. However, a number of key recommendations remain outstanding.

Facility Operating Agreements

OCWA operates over 500 drinking-water and wastewater treatment facilities for 180 municipal clients ranging in size from small well and lagoon systems to large urban water and wastewater treatment systems and their associated distribution

and collection systems. OCWA has 205 contracts in place with these clients to provide operation, maintenance, and other services. OCWA has a few large municipal clients, but most contracts are for operating and maintenance services for small rural municipalities.

There are generally two types of contracts: fixed-price and cost-plus. Under a fixed-price contract, an annual price is established for the cost of operating the facility, including costs such as staffing, chemicals, supplies, insurance, and energy. The following year, the price is adjusted mainly for inflation, changes in flow volumes, and any costs associated with changes in the regulatory environment. Under a cost-plus contract, the cost of operating the client's facility is estimated at the start of the year; then at year-end when actual costs are known, an adjustment is made and the client is either charged the difference or given a refund. The client is also charged an annual management fee for operating and maintaining the facility.

With a fixed-price contract, OCWA takes the risk for changes in the cost of chemicals, supplies, and labour beyond the inflation adjustment. With a cost-plus contract, all cost increases are passed on to the client. Most of OCWA's contracts are at a fixed price, where OCWA bears additional risk relating to price increases above the consumer price index for inputs such as labour and the chemicals used to treat drinking water. Operations managers told us that the client typically decides what type of contract it is willing to enter into, and OCWA uses that as a basis for negotiations. The majority of newly signed contracts are fixed-price, as noted in Figure 12.

Corporate policy on the preparation of pricing proposals for contracts requires that management achieve a balance between the organization's need for cost recovery and the need to submit a low enough price to be selected to provide the service. The policy further states that the pricing decision and supporting rationale must be documented.

We reviewed a sample of fixed-price proposals prepared in 2006 and 2007, and noted that these proposals were generally not properly supported.

Figure 12: Use of Cost-plus vs. Fixed-price Contracts, 2003–2007

Source of data: OCWA

Year Contract Negotiated	Cost-plus Contracts		Fixed-price Contracts	
	#	% of Total Contracts	#	% of Total Contracts
Up to 2003	15	21	57	79
2004	5	24	16	76
2005	15	38	24	62
2006	6	15	35	85
2007	12	37	20	63
Total	53	26	152	74

Where documentation was available, most proposals simply quoted a cost amount by expense type. For example, salary expenses and chemical supplies were quoted as lump sums with no indication of the number of staff needed or the amount of chemicals expected to be used. In some cases additional undefined costs had been added.

Pricing proposals are prepared with the use of a costing summary that details all expected direct costs and a contract margin to cover corporate and regional office overhead costs. However, OCWA has not conducted any analysis to provide guidance to management when applying an overhead margin to pricing proposals. We found that over one-third of all current contracts had been negotiated with margins that were less than the percentage required to recover overhead costs.

We analyzed a sample of contracts to assess the actual margins achieved and found that 40% of contracts reviewed achieved lower margins than originally projected. We found examples where facilities in our sample had negative contract margins for 2007—that is, OCWA did not manage to cover all its direct costs in operating them. For example, direct costs (\$800,000) for one contract exceeded revenue by almost \$60,000. This is a 10-year fixed-price contract to operate a treatment facility for both drinking water and wastewater.

Project Management Agreements

OCWA's engineering services contract its professional engineers and project managers to provide a range of services ranging from technical advice to the management of new facility construction projects. OCWA operates the drinking-water and/or wastewater facilities for most of the engineering services' clients, which are primarily municipalities and First Nations communities. At the time of our audit, OCWA was managing 110 projects, half for a fixed fee and half billed at a rate based on the number of hours staff worked on the project. Revenues from project management services were \$2.2 million in 2006 and \$1.7 million in 2007.

OCWA has developed a set of policies for its engineering services to follow to ensure that they generate a profit, meet their clients' needs, and encourage new business. One of the objectives outlined in the policy is to earn a sufficient margin to contribute to corporate overhead, but we found that the margin achieved in 2006 was only about half the target margin outlined in the business plan. Because a new financial system was being implemented, the margin could not be estimated for 2007. We noted a number of other concerns with corporate policy compliance:

- For fixed-fee contracts, OCWA does not track labour or other costs in sufficient detail to determine if individual projects were profitable. For cost-plus contracts, OCWA established an hourly billing rate that is intended to provide for employee benefits, overhead, and profit. OCWA could not provide us with documentation showing how the billing rate was determined or whether it covered all costs and provided an adequate profit. We were also told that OCWA sometimes takes on an unprofitable project in the hope that it will lead to more profitable work from the client in the future.
- To help assess the feasibility of project proposals, a project initiation/approval form must be completed for each new project. This form is

to be reviewed and approved by a senior manager. However, the form had not been completed for many of the projects we sampled.

- Project management agreements are required to outline project costs, the role and responsibilities of OCWA, and the expectations of the client. However, OCWA could not provide evidence that formal agreements were in place for most of the projects reviewed.
- Written quarterly reports are to be prepared for clients to ensure that OCWA staff are meeting clients' needs and that projects are progressing as planned and staying within budget. Quarterly reports had not been prepared for eight of the 10 projects we sampled that were required to have had them on file.
- A quality assurance review is mandatory under OCWA policy and must be done for each completed project. In addition to closing out the file, the review can highlight concerns, indicate areas for improvement, and identify potential business opportunities. However, this review was not done for any of the completed projects in our sample.

RECOMMENDATION 6

To work toward providing services on a cost-recovery basis at the operations level, OCWA should:

- assess the progress of its 2006 revitalization project and implement the cost-saving initiatives that it deems appropriate;
- put controls in place to ensure that before each contract is approved, the pricing decision and supporting rationale are clearly documented, as required by policy;
- develop a methodology that reasonably estimates the margin required to recover all costs, including corporate overhead;
- implement an approval process whereby contracts with lower margins receive greater scrutiny; and

- implement procedures to ensure that project proposals for engineering services are properly approved, formal contracts are on file, quarterly client reports are prepared, and a quality assurance review is done at the completion of each project.

OCWA RESPONSE

To ensure that OCWA achieves and maintains full cost recovery, it has introduced a number of initiatives:

- OCWA's revitalization initiative recommended a number of proposed changes to OCWA's structure and administrative processes. At the time of the audit, a number of those recommendations had been implemented and significant savings realized. Other changes were contingent upon the completion of the implementation of our new financial system. Now that the implementation is complete, we are moving forward to complete the revitalization project.
- OCWA is enhancing its existing document control process to ensure:
 - better documentation of pricing rationale and any supporting documentation prior to contract approval and execution;
 - more detailed documentation of the rationale for the required contract margin; and
 - clear documentation of the alignment between pre-approval management analysis of contracts to margins.
- As part of OCWA's overall efforts to modernize our financial reporting, in June 2007 we introduced a new financial system, which incorporates project accounting capability. Specific attention is being given to Engineering Services to support enhanced project tracking and to allow for appropriate oversight. In addition, new tools such as business process management software will be used to allow for more rigour in control procedures.

PROCUREMENT OF GOODS AND SERVICES

A memorandum of understanding with the Ministry requires OCWA to comply with all government procurement directives for the purchase of good and services. These directives outline the principles of acquiring goods and services in the most economical manner. Purchasing at OCWA is decentralized and is done at regional and hub offices as well as head office. For the 2007 calendar year, OCWA non-salary expenses totalled \$72.6 million.

Purchases for goods and services under \$1,000 can be made with a corporate purchase card, which is issued to a number of OCWA employees. Also, OCWA's employees are reimbursed for travel expenses incurred for business purposes. OCWA has developed detailed policies to monitor and control these expenditures. In 2007, employees spent \$646,000 using corporate purchase cards and approximately \$1 million for travel costs.

We reviewed corporate-card and employee-travel expenditures, and found that adequate procedures were in place to ensure that these expenses were for legitimate business purposes, and that managers reviewed and approved related statements on a timely basis. However, statements often did not include original itemized receipts, which help to prevent the same transaction from being paid twice and help management assess the appropriateness of the amounts claimed.

Procurement policies for other goods and services require proper approvals, formal contracts, adherence to agreed pricing terms, and adequate documentation for purchases, among other requirements. OCWA has also established a competitive process, as outlined in Figure 13. With the exception of sole-sourced purchases over \$10,000, the rationale for which must be documented, the purchasing requirements become more rigorous as the estimated dollar value increases.

We reviewed a sample of purchases and found that all requisitions and purchase orders had been properly approved, but purchasing files often did

Figure 13: OCWA Competitive Purchasing Process

Source of data: OCWA

Value of Purchase (\$)	Competitive Process Required
< 1,000	no mandatory competitive process
1,000–10,000	3 verbal quotations
10,000–100,000	3 written quotations
100,000–250,000	request for quotation—OCWA invites certain vendors to bid (invitational tender)
> 250,000	request for tender—an advertised open tender where all interested vendors can bid

not contain the relevant documents to justify decisions or show adherence to competitive and other purchasing policies. For example:

- OCWA did not ensure that formal contracts, which spell out the terms and conditions of the purchase, were in place for all major acquisitions. For example, a three-year contract that came into effect on January 1, 2007, remained unsigned by the vendor at the time of our audit. As of January 31, 2008, without a formal contract in place, OCWA had paid this vendor \$545,000 for the provision of liquefied chlorine.
- Procedures were not in place to ensure that three written quotes were received for the purchases in our sample where they were required. In fact, most of these purchases were sole-sourced with no documented justification on file.
- We found cases where purchases greater than \$250,000 were acquired through a request for quotation (that is, invitational tender) rather than an open advertised competition. For example, OCWA entered into a \$3.7 million contract in 2001 with a vendor for sludge haulage and removal. The vendor was originally obtained through a request for quotation (invitational tender), not a public request for tender, as required. When the contract expired in 2006, it was extended without competition.
- A process was not in place to ensure that OCWA paid the agreed-upon price. We noted several examples where prices set in contract

agreements or purchase orders did not agree with the actual prices charged. In one case, a chemical supplier charged almost 21¢ per litre for chemicals when the contract specified 18¢ per litre. This small discrepancy accumulated over 40 invoices for a total overpayment of \$29,000 in 2007. We were informed that this overpayment, and the others we found, would be recovered.

RECOMMENDATION 7

To comply with its procurement policies, which provide for the acquisition of goods and services in an open and competitive manner, OCWA should implement procedures to ensure that:

- corporate-card and travel-expense statements submitted for review are supported by original and itemized receipts;
- goods and services are acquired in accordance with OCWA's competitive purchasing policy;
- signed contracts and other relevant documentation is on file for all major purchases; and
- payments to vendors are made in accordance with agreed-upon terms and prices.

OCWA RESPONSE

OCWA thanks the Auditor General for his review of procurement policies and the comments offered. OCWA will reinforce with staff the need to include original and itemized receipts for all business expenses. We recognize the importance

of competitive acquisition as a means of ensuring that goods and services are acquired economically. In instances where an acquisition must be single-sourced, we will ensure that documentation supporting that decision is retained in the procurement file.

Wherever possible, OCWA endeavours to ensure that signed contracts are in place for all major purchases prior to making payments. However, in the situation identified, we proceeded with the acquisition of chemicals while final contract terms, which protect the interests of the agency and its clients, were still being finalized. This was necessary in order to adhere to requirements under legislation and regulation and to ensure the health and safety of the communities in which we operate.

We have recovered the overpayment referred to and have implemented additional control procedures to ensure that such incidents do not recur.

GOVERNANCE, ACCOUNTABILITY, AND EFFECTIVENESS

Governance and Accountability

OCWA is governed by a Board of Directors, the members of which are appointed by the Lieutenant-Governor-in-Council on the recommendation of the Premier and the Minister of the Environment. The Board is responsible for overseeing OCWA's affairs and setting its strategic direction. The Board is accountable to the provincial Legislature through the Minister of the Environment.

In May 2002, the *Part Two Report of the Walkerton Commission of Inquiry* recommended changes in the Board's composition. The inquiry resulted from the May 2000 incident in the municipally run system in Walkerton, Ontario, where seven people died and 2,500 became ill when the water supply was contaminated with a deadly strain of *E. coli* bacteria. Justice O'Connor, the commissioner of the inquiry, looked into the risks posed throughout the

drinking water industry; with respect to OCWA, he recommended an arm's-length agency with an independent, qualified board responsible for choosing the chief executive. OCWA's Board of Directors at that time consisted of deputy ministers from various government ministries.

In 2007, the government began appointing persons from outside the Ontario Public Service to OCWA's Board of Directors. As of June 2008, five of the eight Board members had been appointed from outside the public service, and it was evident that an effort has been made to add Board members with industry experience. Two civil servants and OCWA's Chief Executive Officer (CEO) made up the remaining three positions. The Board is still not able to appoint its CEO, as this would require a legislative change.

A key role of a board of directors is to set and monitor the strategic direction of an organization and to evaluate the CEO's performance in achieving the organization's objectives and targets. In this respect, it may not be appropriate for the CEO to be a member of the Board of Directors. Rather, the CEO should be available to answer questions and provide information requested by the board. We reviewed the board membership of other Ontario government operational enterprises to determine if their CEOs are board members and noted that they typically are not.

Management reporting to OCWA's Board of Directors typically consists of a number of reports and presentations, such as quarterly status reports on all key initiatives and performance measures published in the business plan, a review of quarterly financial results, an annual review of litigations and claims, and an annual compliance report. We reviewed OCWA's annual compliance reports for the last three years and noted that they were often incomplete and inconsistent. For example:

- The reports did not include any information on the results of facility assessment reviews or compliance audits, which are OCWA's main internal activities for monitoring compliance.

- Data on the number of ministry inspections and resulting issues raised included the results of inspection reports received at the time the annual report was produced. However, the comparative numbers for previous years did not include the inspection results for the entire year, even though these figures were available. The report included, as prior year comparatives, the incomplete figures from the previous year's report.
- In 2005, OCWA provided a breakdown of issues identified during ministry inspections and reported the number of provincial officer's orders. However, these useful statistics were not provided in the 2006 and 2007 reports. In addition, in 2005 and 2006, OCWA reported year-to-year statistics on the frequency of employee injuries. Such comparisons were not reported in the 2007 report.

OCWA lacks a set of corporate policies that outline internal reporting requirements from one level of the organization to the next, which are needed to produce accurate and reliable summary reports for the Board. Such information would assist the Board in its oversight role.

RECOMMENDATION 8

To assist the Board of Directors in carrying out its responsibility to oversee the affairs of the organization and set its corporate direction, OCWA should enhance the reliability and usefulness of its summary reporting to its Board.

OCWA RESPONSE

OCWA's Board of Directors and the Board's Audit and Risk Management Committee have established a comprehensive work plan detailing reporting requirements for the year. Over the last 12 to 18 months, the Board has transitioned from a board comprising public service employees to a board of individuals of whom the majority are from the private or municipal sec-

tors. The current Board has been working with senior management to define more clearly the information required to carry out the Board's oversight responsibilities with respect to OCWA.

To facilitate further the flow of information to senior management and the Board, we have expanded the role of our internal operations committee to ensure that timely and relevant information required by the Board concerning all areas of OCWA's operations is provided.

Measuring and Reporting on Effectiveness

The objectives of OCWA, according to legislation, are to assist municipalities and others in providing drinking-water treatment and wastewater facilities on a cost-recovery basis by financing, planning, developing, building, and operating such facilities and services; and to provide these services so as to protect human health and the environment. Also, as a government operational enterprise, OCWA is expected to sell goods or services to the public commercially in competition with the private sector.

OCWA has developed a number of good-performance measures during its business planning process and has reported on these measures in its annual report, which is available to the public. Given its mandate, many of OCWA's performance measures focus on the business side of its operations, including providing client service and securing new clients. Other measures focus on compliance with legislation and employee relations. In its 2007 annual report, OCWA reported that it had achieved 18 of 28 performance measures and that the rest were either on track or being reconsidered as to their appropriateness. OCWA could enhance its annual report by including performance information that directly assesses its objective to protect human health and the environment, such as reporting on adverse water-quality incidents and releases of unprocessed wastewater into the environment.

Some of OCWA's performance measures are outcome-based and others are activity-based. Examples of outcome-based performance measures include achieving \$2 million in new business, having at least 80% of its clients renew their contracts, and reducing the number of non-compliant events compared to the previous year. Examples of activity-based performance measures include completing facility assessments for all facilities, having senior management attend a specified number of hub staff meetings, and updating processes and procedures. Activity-based measures can help achieve organizational objectives, but they do not measure the level of organizational success.

RECOMMENDATION 9

In order to enhance the performance measures currently contained in its annual report, OCWA should:

- enhance performance measures for its mandate to protect human health and the environment; and
- consider enhancing its performance measures by focusing more on outcomes than on activities.

OCWA RESPONSE

OCWA will review its established performance measures for opportunities to reflect better our commitment to protecting human health and the environment for inclusion in our 2009 business plan.

OCWA has also engaged a recognized expert in performance metrics to assist it in developing measures that place a greater focus on outcomes rather than activities. These measures will be included in OCWA's 2009 business plan.