



Clause 3 in Report No.6 of Committee of the Whole was adopted, without amendment, by the Council of The Regional Municipality of York at its meeting held on March 26, 2015.

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2014 Integrated Management System Update for Water, Wastewater and Waste Management

Committee of the Whole recommends:

1. Receipt of the presentation by Brett Bloxam, Director of Operations, Maintenance and Monitoring and David Szeptycki, Head of Strategy, Liaison and Policy Implementation, Environmental Services regarding “Delivering Operational Excellence for Water and Wastewater Services”.
2. Adoption of the following recommendation contained in the report dated January 14, 2015 from the Commissioner of Environmental Services:

1. Recommendation

It is recommended that this report be received for information.

2. Purpose

This report updates Council on the status of Environmental Services’ Integrated Management System as required by the Ministry of the Environment and Climate Change’s Drinking Water Quality Management Standard. This report also supports Council in meeting commitments under Standard of Care, as prescribed in the *Safe Drinking Water Act, 2002*.

3. Background

Environmental Services’ Integrated Management System has evolved to include ISO 14001, ISO 9001 and Ontario’s Drinking Water Quality Management Standard

Starting in 2000, Environmental Services’ began the process of ISO 14001 certification by voluntarily adopting an Environmental Management System for wastewater operations. This standard helps York Region minimize operational

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impacts on the environment, comply with applicable laws, regulations and other environmental requirements, while continually improving environmental management. In 2001, Environmental Services' water operations received ISO 9001 registration after Council endorsed implementation of a quality management system. This standard assists York Region with meeting the needs of customers and other stakeholders, while continually monitoring and improving quality.

To prepare for inclusion of waste management services and the Ministry of the Environment and Climate Change's Drinking Water Quality Management Standard, Council authorized implementation of a single Integrated Management System Policy in 2009. In 2010, the existing ISO 14001 certification was expanded to include waste management operations and in 2014 to include the Environmental Monitoring and Enforcement unit.

In response to the Walkerton water quality tragedy in 2000, the Province created the Drinking Water Quality Management Standard, which is a legal requirement under the *Safe Drinking Water Act, 2002* and the Municipal Drinking Water Licensing Program. This tool helps ensure that consistent processes and procedures are in place to manage risks associated with production and delivery of high quality drinking water.

Integrated Management System provides a mechanism for discipline and control of the drinking water system to support Council's Standard of Care obligations

Councillors have an important role to play in ensuring that York Region's drinking water systems provide safe, high-quality drinking water. Effective December 31, 2012, Section 19 of the *Safe Drinking Water Act, 2002* clarifies the legal responsibility held by people with decision-making authority over municipal drinking water systems by imposing a statutory Standard of Care. This requirement is further defined in the 2014 Annual Drinking Water System Summary Report (also on this agenda).

An Integrated Management System helps Council meet Standard of Care and due diligence requirements by providing confidence that appropriate management controls over drinking water systems have been established. Under Environmental Services' Integrated Management System, Corporate Top Management is identified as Council and the Chief Administrative Officer. Corporate Top Management must be provided with details on the continuing suitability, adequacy and effectiveness of the management system, Figure 1. This report is one way that information is provided, along with the 2014 Annual Drinking Water System Summary Report.

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Figure 1
**Standard of Care Roles and Responsibilities
for York Region's Drinking Water System**



Integrated Management System Policy provides foundation for management system commitments and is prominently displayed at all registered facilities

Environmental Services is committed to demonstrating leadership through the Integrated Management System; the department's commitments are summarized in an Integrated Management System Policy, which contains objectives and obligations for delivering an effective and integrated management system. In 2014, the Policy was updated to better align with the Corporate Strategic Plan and includes clear line of sight to the four principle objectives of the Integrated

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Management System as required by the International Organization for Standardization and the Drinking Water Quality Management Standard, Figure 2.

Figure 2
Integrated Management System Policy

Our innovative people provide environmental services that protect public health and the environment to meet the needs of our thriving communities.

We are committed to the following objectives:



4. Analysis and Options

Auditing verifies effectiveness of the Integrated Management System by evaluating conformance with each management system standard

ISO 9001, 14001, and the Drinking Water Quality Management Standard emphasize the importance of audits as a tool for monitoring and verifying effective implementation of quality and environmental policies. An effective

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auditing program is a critical component of the Integrated Management System to monitor compliance with regulatory requirements and enhance system performance via continuous improvement.

York Region's Integrated Management System uses three types of audits:

1. Internal audits conducted by staff to proactively confirm conformance with management system requirements
2. Compliance audits conducted by staff to evaluate operational activities against applicable regulatory requirements to ensure compliance with regulations
3. External audits completed by a third-party registration body to confirm registration/accreditation

In 2014, 100 audits were conducted, covering 55 per cent of York Region's water, wastewater and waste management facilities. Each facility is visited at least twice in a three-year period, once for an internal audit and once for a compliance audit. This audit frequency exceeds industry best practice. Over the last year, findings from internal and external audits identified opportunities for system enhancements to further strengthen decision-making processes and management system performance, as identified in continuous improvement initiatives below. A summary of the Region's water, wastewater and waste management audits completed in the 2014 calendar year are listed in Table 1.

Table 1
2014 Water, Wastewater and Waste Management Audits

System	Internal Audits	Compliance Audits	External Audits
Water	29	29	6
Wastewater	6	14	7
Waste Management	3	3	3
2014 Total	38	46	16

York Region successfully completed third-party surveillance audits for ISO 9001, 14001 and Drinking Water Quality Management Standards in 2014

Registration to ISO 9001 and ISO 14001 requires an annual onsite assessment of conformance to ISO standards by a third-party registration body. An ISO 9001 audit occurred in February 2014, resulting in one minor non-conformity. An ISO 14001 audit occurred in October/November 2014, resulting in three minor non-

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conformities. All findings were related to internal business processes, ultimately posing no risk to drinking water quality or environmental performance. Corrective action plans were developed and approved by the third-party registration body.

Accreditation under the Drinking Water Quality Management Standard involves ongoing assessment and evaluation by a third-party Registrar. In December 2014, a third-party Registrar performed a documentation audit on York Region's quality management system for drinking water, which found the system effective. One non-conformity and three opportunities for improvement were identified through the audit. All findings were related to documentation, which posed no risk to the Region's drinking water quality. A corrective action plan was implemented and accepted by the third-party Registrar.

Staff immediately acted to implement corrective action plans in response to audit findings. No significant impediments are anticipated to complete tasks related to the corrective actions or opportunities for improvement.

Opportunities to evaluate and improve system performance include an annual management review with Operational Top Management

Annual management review meetings are a requirement of the Drinking Water Quality Management Standard and ISO management standards. This is an important mechanism used by Operational Top Management to assess the adequacy, suitability and effectiveness of the Integrated Management System. The review focuses on operational performance, management system performance, audit results, regulatory requirements and resources. These reviews help identify opportunities for continuous improvement of business practices to improve efficiency and drive results. System accomplishments are highlighted during the annual management review meeting. A summary of accomplishments in 2014 that support the four main objectives of the Integrated Management System Policy are summarized in Attachment 1.

Continuous improvement initiatives demonstrate success in Integrated Management System performance

As part of ongoing continuous improvement initiatives, Environmental Services completed a number of improvements to the Integrated Management System in 2014. Completed initiatives include a water and wastewater sample program review, resulting in program efficiencies such as a reduction in cost and time associated with conducting sampling and analysis. Additional initiatives that have resulted in efficiencies include redeployment of staff to high-risk program areas such as adverse water quality event reporting, a focused effort on closing long-term action items in the document and task management software, and a streamlined process to track improvement initiatives. An upgraded document

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management process was also implemented, which consolidated policy documentation, requiring less time to maintain. Together these initiatives support efficiency, cost savings, and enhanced system performance, which help position the Integrated Management System for future growth, refinement and continuous improvement.

Action underway to bring additional business units and processes into Integrated Management System to further mitigate risks

In 2014 staff expanded the scope of ISO 14001 registration to include the Environmental Monitoring and Enforcement unit, responsible for the enforcement of York Region's Sewer Use Bylaw. A direct benefit realized is the establishment of standardized processes and procedures that provide clarity and consistency for staff. Another benefit of ISO registration is the opportunity to create meaningful key performance indicators and targets, which are tracked and actioned to formalize continuous improvement activities.

Staff also implemented compliance audit processes to review requirements of the commissioning phase of capital projects and formalize the operational integration of new or replaced infrastructure. In 2015, staff will develop multi-year implementation recommendations for further inclusion of the Capital Planning and Delivery Branch into the Integrated Management System. Incorporating additional business units into the Integrated Management System will bring robust auditing and controls through various stages of Environmental Services' program delivery.

Link to key Council-approved plans

This report provides Council with an overview of the department's Integrated Management System for water, wastewater and waste management. Following a common framework of systematic continuous improvement and integration of quality and environmental standards in decision-making demonstrates a commitment to protecting public health and the environment.

Maintaining Environmental Services' management system aligns with the Region's 2015 to 2019 Strategic Plan objective of strengthening organizational capacity and effectiveness. This work supports our growing communities by identifying and leveraging performance, and continuous improvement initiatives.

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5. Financial Implications

Investment in the Integrated Management System provides a framework to mitigate risk, monitor and comply with regulatory requirements and continuously improve

The Integrated Management System provides a structured system of checks and balances for staff to mitigate risk, monitor and comply with regulatory requirements and continually improve programs and processes used to deliver water, wastewater, and waste management services. Additionally, investment in the management system assists Council with meeting obligations prescribed in the *Safe Drinking Water Act, 2002*.

Total program costs to operate the Integrated Management System are budgeted at \$1.24 million for 2015. Ninety-one per cent of program costs are funded from user rates, representing 0.25 per cent of the total rate budget. Nine per cent of total program costs are funded from the tax levy.

6. Local Municipal Impact

An Integrated Management System for Environmental Services provides a benefit to local municipalities as it supports a shared interest in mitigating environmental impacts, improving service delivery and complying with regulatory requirements in a two-tier service delivery model. All local municipalities have a quality management system to meet requirements of the Drinking Water Quality Management Standard. Following regulatory requirements with a high degree of compliance assists the Region in delivering a safe, sustainable supply of drinking water, as well as providing wastewater and waste management services with minimal operational impact on the environment.

7. Conclusion

Environmental Services' Integrated Management System helps York Region limit risk by minimizing operational impacts on the environment, complying with applicable laws, regulations and other environmental requirements, and continually evaluating program delivery. Providing information on the performance and enhancements to the Integrated Management System supports Council in meeting Standard of Care requirements under the *Safe Drinking Water Act, 2002*. Rigorous and comprehensive evaluation features, such as the audit program and management review process, which are built into the management system, demonstrates leadership and commitment to ongoing improvement of the Department's programs and services.

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For more information on this report, please contact David Szeptycki, Head of Strategy, Liaison and Policy Implementation at ext. 75723.

The Senior Management Group has reviewed this report.

Attachments (2)

York# 5963585 - 2014 Integrated Management System Accomplishments

Accessible formats or communication supports are available upon request.

Environmental Services



2014 Integrated Management System Accomplishments

Objective 1) Mitigate our environmental impact related to day-to-day activities through protection and preservation of the environment

- Implemented review of Integrated Management System operational performance and status of improvement initiatives through monthly Continuous Improvement team meetings
- Continued use of root cause analysis exercises to analyze environmental incidents to mitigate future occurrences and identify opportunities for system-wide improvement
- Expanded scope of ISO 14001 registration to include Environmental Monitoring and Enforcement to mitigate environmental impact on Regional wastewater infrastructure

Objective 2) Comply with legislation and requirements, report to Council and Integrated Management System top management related to our services, including provision of safe drinking water

- Achieved 100 per cent compliance score on Ministry of the Environment and Climate Change water facility inspection reports for 2012 – 2013 reporting period
- Conducted internal audits at 38 facilities, compliance audits at 46 facilities and external audits at 16 water, wastewater and waste management facilities
- Redeployment of staff to high-risk program areas (e.g. adverse water quality event reporting)
- Completed facility walk-throughs at water facilities to confirm conformance with regulatory approvals and identified opportunities to incorporate updates into Municipal Drinking Water Licence applications
- Formalized internal response process to Ministry of the Environment and Climate Change inspections

Objective 3) Monitor and maintain infrastructure to continue to provide quality services to our communities

- Implemented capital infrastructure commissioning review process
- Piloted a management inspection and tour of facilities reviewing key findings/outcomes of external inspections and audits to promote greater awareness of audit protocols
- Formalized review method for monitoring customer concerns on a quarterly basis
- Modified system objectives, targets and programs to align with corporate and departmental strategic goals



2014 Integrated Management System Accomplishments

Objective 4) Maintain and continually improve the effectiveness of our management systems

- Reviewed water and wastewater sample program, resulting in reduced sample analysis costs and reduced sample time for employees
- Implemented document management process change, resulting in documentation improvements
- Upgraded document and task management software (Intelex) resulting in improved task tracking and reporting functions
- Planned integration activities to further expand scope of registration in Environmental Services
- Successfully implemented monthly performance measures to monitor Integrated Management System effectiveness



Operational Excellence for Water and Wastewater Services

Presentation to
Committee of the Whole

David Szeptycki and Brett Bloxam

March 12, 2015

Overview

- Proactively managing risk to support regulatory compliance
- IMS Update
- Summary of drinking water quality results for 2014
- Reporting requirement of the Safe Drinking Water Act
- Operations Maintenance and Monitoring Achievements



Providing high quality drinking water to our communities through programs designed to meet Ontario's regulatory requirements for drinking water

14

WATER
SYSTEMS

3

WATER
TREATMENT
PLANTS

44

STORAGE
FACILITIES



72

KILOMETRES
for water to travel
to Council Chambers



75

KILOMETRES
for water to travel
to the treatment plant



COMPLEX AND GROWING SYSTEM

40

WELLS

344

KILOMETRES of WATER MAINS

322

KILOMETRES of
WASTE WATER PIPES

8

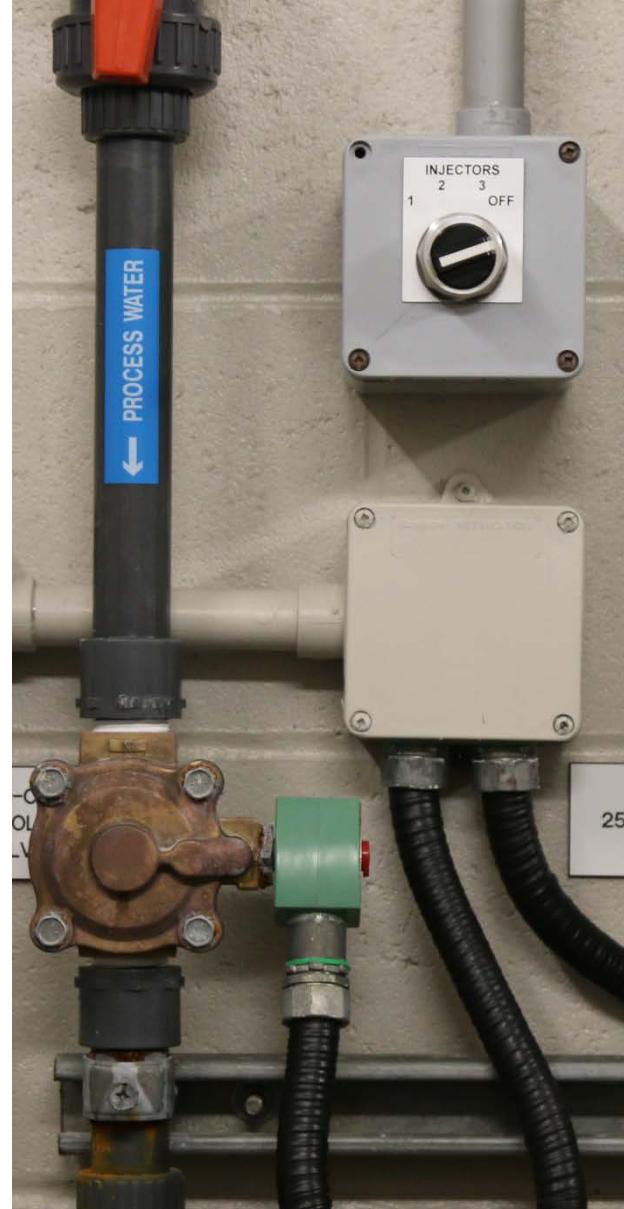
WASTEWATER
TREATMENT
PLANTS



Council Responsibilities

Statutory Standard of Care – Safe Drinking Water Act, 2002

- Integrated Management System comprehensively manages risk
 - Drinking Water Quality Management Standard
 - ISO 9001 Quality Management Standard
 - ISO 14001 Environmental Management Standard
- Drinking Water Summary Report
 - Provides water quality and quantity information to inform Standard of Care
 - Meets requirements under Sec. 11 and Sch. 22 of Safe Drinking Water Act



Environmental Services well positioned to meet regulatory requirements and beyond

Integrated Management System (IMS) Update





ISO 9001/14001 and Drinking Water Quality Management Standard help mitigate risk to deliver high quality services



Corporate Top Management

- Council
- Chief Administrative Officer

Roles and Responsibilities

- Standard of care for drinking water
- Overall direction for Environmental Services
- Approval of resources and budget

Council Report Updates



Operational Top Management

- Commissioner
- Directors
- Managers

Roles and Responsibilities

- Strategic direction for Integrated Management System
- High-level operational decision making
- Drinking Water Quality Management Standard Representative

Management Review • Audits • MOECC Inspections



Water and Wastewater Operations

- Operators and Water Quality Analysts
- Technical Support Staff
- Integrated Management System Coordinators

Roles and Responsibilities

- Front line operations and water quality sampling
- Maintenance, inspection and asset management
- Internal audits and regulatory reporting

DWQMS provides framework of accountability to deliver safe drinking water

Proactively Managing Risk and Compliance

- Consistent practices through operating and emergency procedures
- Periodic documentation review and updates
- Centralized administration of compliance
- Monitoring of certification and training
- Identification and management of risks



Comprehensive system with documentation, training and audit oversight to deliver high quality services

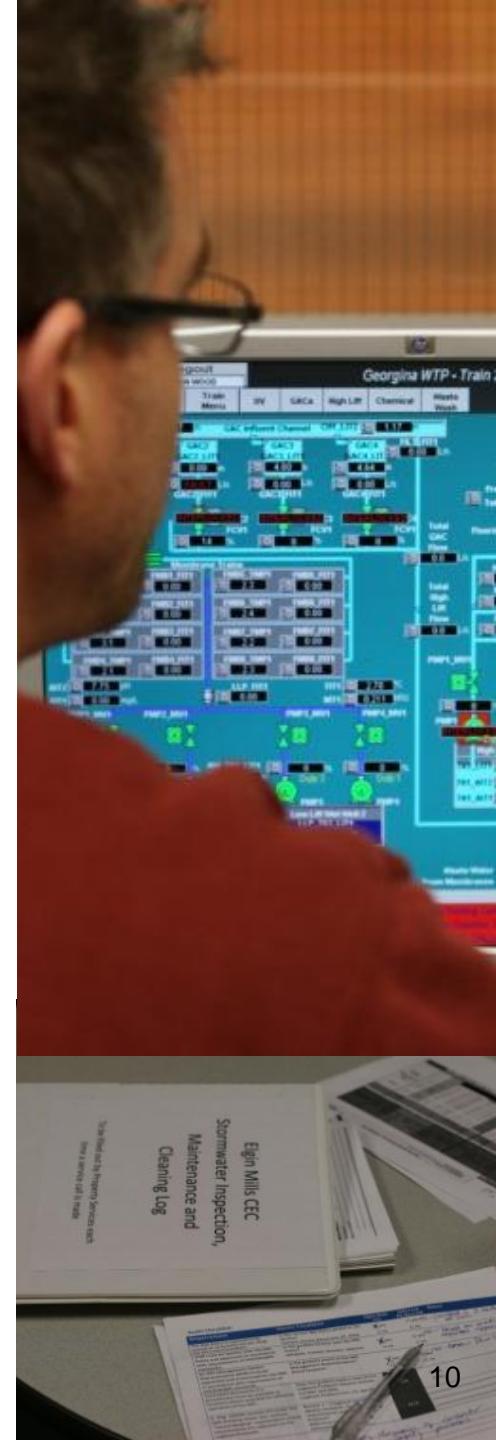
Comprehensive Audit Program

System	Internal Audits	Compliance Audits	External Audits
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TOTAL	38	46	16

Integrated Management System is Council's safeguard to achieving Statutory Standard of Care responsibilities

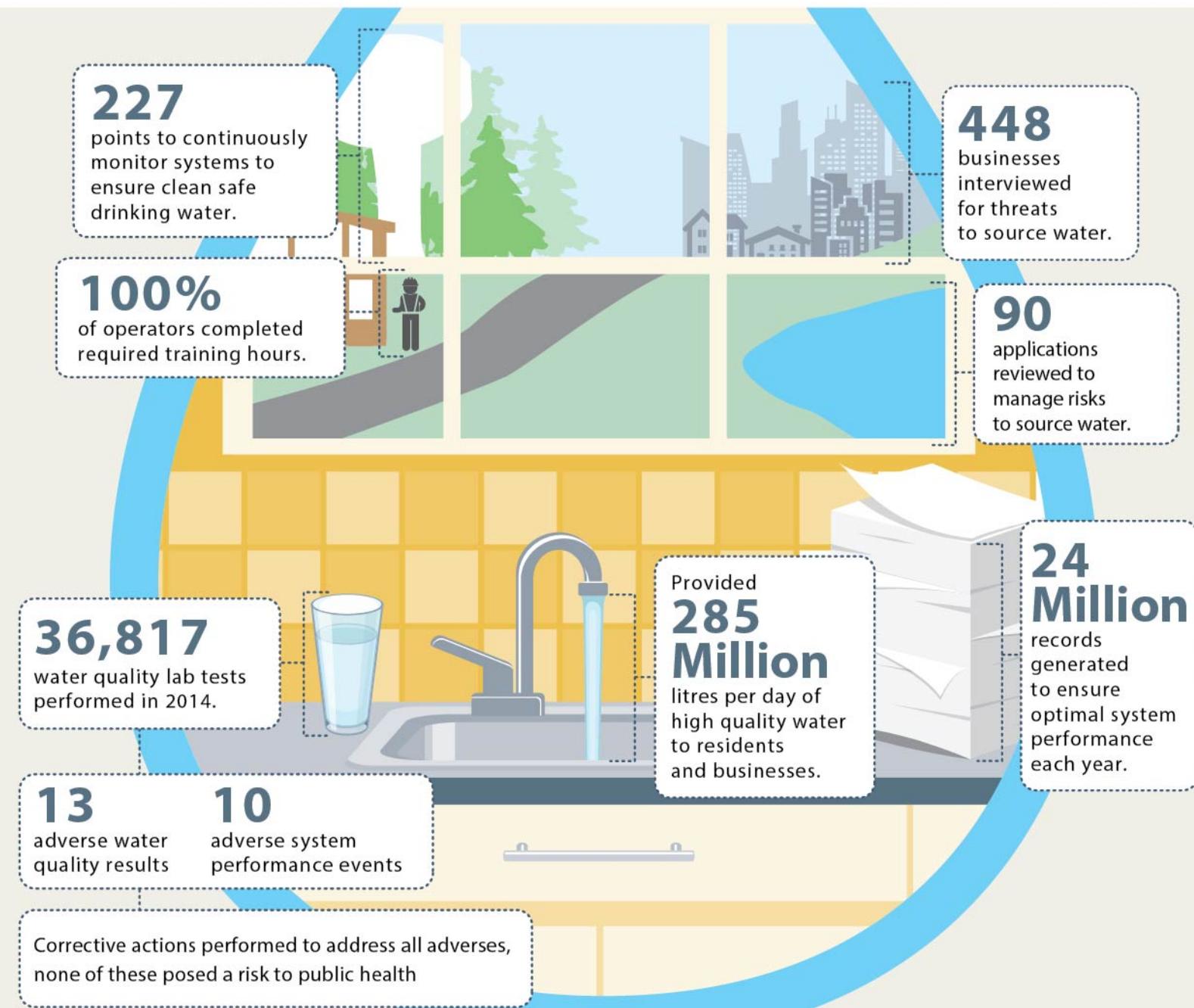
Continuous Improvement

- 2014 initiatives support efficiency, cost savings and enhanced system performance
- Completed initiatives include:
 - Water and wastewater sample program review
 - Redeployment of staff to priority program areas such as adverse water quality event reporting
 - Upgraded document management process, requiring less time to maintain
 - Integration activities to include additional Environmental Services business areas into scope of registration
- Conduct annual management review meeting



A photograph of three women in a kitchen. On the left, a woman in a blue zip-up jacket is washing a orange carrot in a stainless steel sink. In the center, an older woman with grey hair, wearing a red cardigan and a patterned scarf, is smiling broadly. On the right, a younger woman with dark hair, wearing a teal hoodie over a grey top, is smiling and has her arm around the older woman's shoulder. They are standing in front of a kitchen counter with various vegetables like bell peppers and mushrooms on it.

Annual Drinking Water Quality Report



Water Quality Sample and Performance Results

Adverse Water Quality Results

Parameter	Number of Events
Sodium	11
Coliforms	1
Nitrate	1
TOTAL	13

Adverse System Performance Events

Parameter	Number of Events
Chlorine	5
Fluoride	2
Contact Time	1
Turbidity	1
System Pressure	1
TOTAL	10

Over 24 million records of continuous monitoring of drinking water and wastewater systems

MOECC Inspections – Water and Wastewater

System	Year	# MOECC Inspections Completed	# Non-Compliance Findings	# Best Practice Recommendations
Water	2014	15	7	8
Wastewater	2014	1	2	0

- Inspections resulted in high overall inspection ratings
- All non-compliance and best practice recommendations were followed up on with appropriate corrective actions including:
 - Successful application and approval to use continuous monitoring for turbidity and chlorine
 - Operator training
 - Updated protocols and procedures



100% York Region's Drinking Water Systems operated within allowable flow and withdrawal limits set by MOECC issued Permits to Take Water

Ontario Chief Drinking Water Inspector's Annual Reports 2011-2013

Municipality	Inspection Rating (%)		Water Quality (% Tests Meeting Standards)	
	2011 - 2012	2012 - 2013	2011 - 2012	2012 - 2013
York	100	100	100	100
Durham	99.83	100	99.90	99.96
Halton	98.78	100	99.95	99.99
Peel	99.59	99.35	99.97	99.96
Toronto	99.42	98.38	99.89	99.91

York Region perfect in 2012 – 2013
Ontario Chief Drinking Water Inspector's report

Operations Maintenance and Monitoring Achievements



Key Achievements for Operations Maintenance and Monitoring in 2014



Leveraging Efficient and Effective Operations

- Implementation of 24/7 shift to increase coverage
- Strong business continuity plans to respond to emergencies due to climate change
- Continuous improvement and reliability teams created to provide support to front line
- Multi-barrier approach to manage risk

Using data and key performance indicators for continuous improvement of operations



Operational Excellence in a Highly Regulated Business

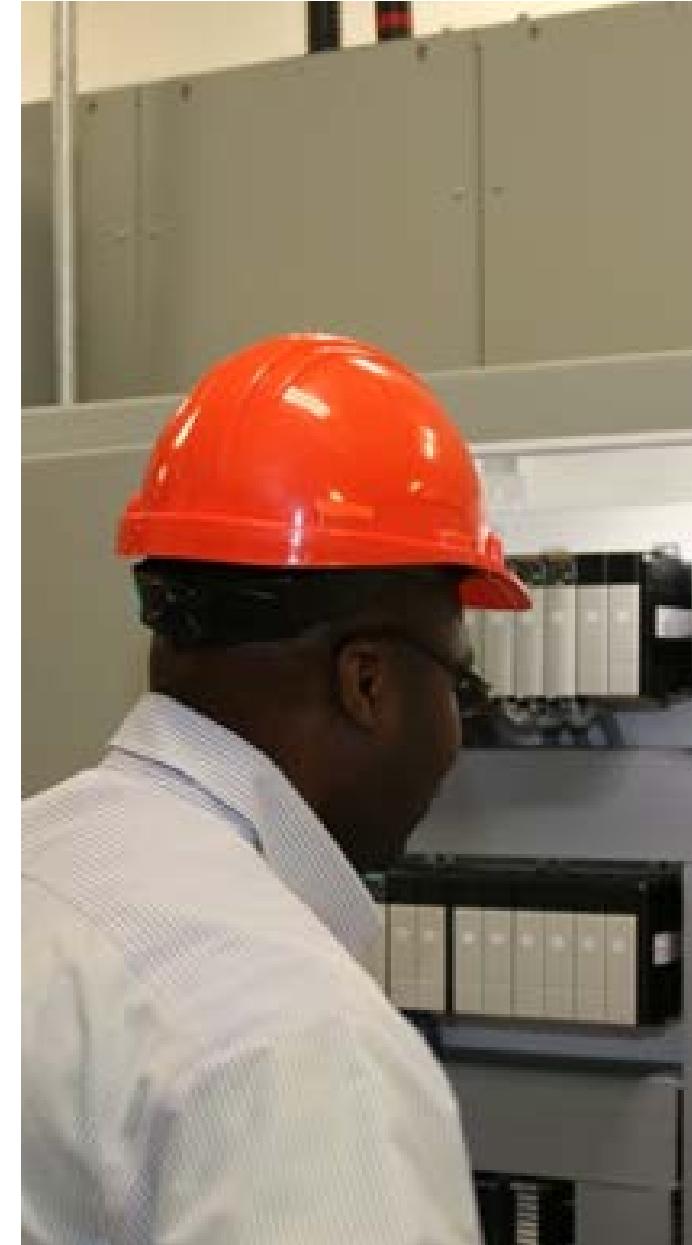
- Continue to achieve industry leading top marks for MOECC inspections
- Leveraging data to make evidence based decisions
- Continue to maintain compliance while operating facilities during construction of complex capital projects



Technology and automation optimizes staff resources and reduces risk

Fiscal Responsibility to Manage Costs

- Driving out costs through review of program activities and optimization of business processes
- Savings in standby and overtime costs by realigning business
- Implementation of proactive maintenance strategy reduces costs and increases reliability of assets
- Process optimization to manage increasing energy and chemical costs
- Review of sampling, training and purchasing programs to save costs



Operations Maintenance and Monitoring is responsible for maintaining assets valued at nearly \$4 billion

Industry Leadership and Best Practices

- Key partnerships with University of Toronto and Water Research Foundation
- Collaboration with local municipalities to develop operating strategies, data sharing and service level agreements
- Participation on industry committees to leverage industry best practices



Operating in a Complex Environment

- Increased focus by MOECC on wastewater inspections using rigorous water inspection methodology
- Developed succession plans to retain and attract trained staff in a competitive market
- Increasing focus on asset condition and maintenance practices to understand risk and consequence of system failures



Operations well positioned to successfully tackle complex challenges delivering water and wastewater services

Delivering Essential Services to Our Customers

Extensive alarm management strategy reduced alarms as high as
75%

Over **26,800** work orders successfully completed

~30% increase in assets by 2016

Completed **5,294** utility locates

Inspected **52km** trunk sewers and watermains

Support for **70** capital projects with over **35** in construction in 2014

ZERO
boil water advisories since 2004 or water restrictions since 2008

Meeting Changing Customer Expectations

- Public understanding of complex business
- Reliable and resilient 24/7 services
- Essential service for community growth and well being
- Protect public health and the environment
- Deliver Council commitments and Statutory Standard of Care





**“The most important health care provider in your community
is the person who takes care of the water.”**

Bernadette Conant, Executive Director of Canadian Water Network