

INAUGURAL MANAGEMENT REVIEW REPORT DRINKING WATER QUALITY MANAGEMENT STANDARD (DWQMS)

REPORTING PERIOD:

JANUARY 1 TO OCTOBER 31, 2008

REGULATORY COMPLIANCE AND POLICY
ENVIRONMENTAL PROMOTION AND PROTECTION BRANCH
DEPARTMENT OF ENVIRONMENTAL SERVICES



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1.0 INTRODUCTION TO DWQMS MANAGEMENT REVIEW

The best way to achieve a healthy water supply is to apply barriers that keep water contaminants from reaching users.

The requirements of management review are dictated by Element 20 “Management Review” of the Ministry of the Environment’s (MOE) Drinking Water Quality Management Standard (DWQMS). This standard requires that a management review is conducted at least once every 12 months to evaluate the continuing suitability, adequacy and effectiveness of the Quality Management System (QMS). York Region has committed to completing a DWQMS management review bi-annually.

Through the management review process, Top Management shall identify deficiencies and action items (including personnel responsible and proposed timelines for implementation) to address the deficiencies. Results of the management review are reported to the Owner through Council Reports.

The standard requires that input into management review include:

- a) incidents of regulatory non-compliance
- b) incidents of adverse drinking-water tests
- c) deviations from critical control point (CCP) limits and response actions
- d) the risk assessment process
- e) internal and third-party audits
- f) emergency response testing
- g) operational performance
- h) raw water supply and drinking water quality trends
- i) action items from previous management reviews
- j) status of other management action items
- k) changes that could affect the quality management system
- l) consumer feedback
- m) resources to maintain the DWQMS
- n) infrastructure review
- o) operational plan: currency, content, updates
- p) staff suggestions, recommendations for improvement

This report, and corresponding presentation, provides an overview of the operational performance of our drinking-water systems, as well as functional performance of our management system.

It is expected that future DWQMS management reviews will be conducted in conjunction with ISO management reviews. All current year data will be compared to previous year(s) data, where applicable.

2.0 ROLES AND RESPONSIBILITIES OUTLINED IN THE DWQMS

Element 9 of the DWQMS requires the Operational Plan to document the organizational structure, roles, responsibilities and authorities of the Operating Authority (Regional Municipality of York, Environmental Services Department). The table below outlines each group that has a role in the delivery of safe drinking water and their respective responsibilities.

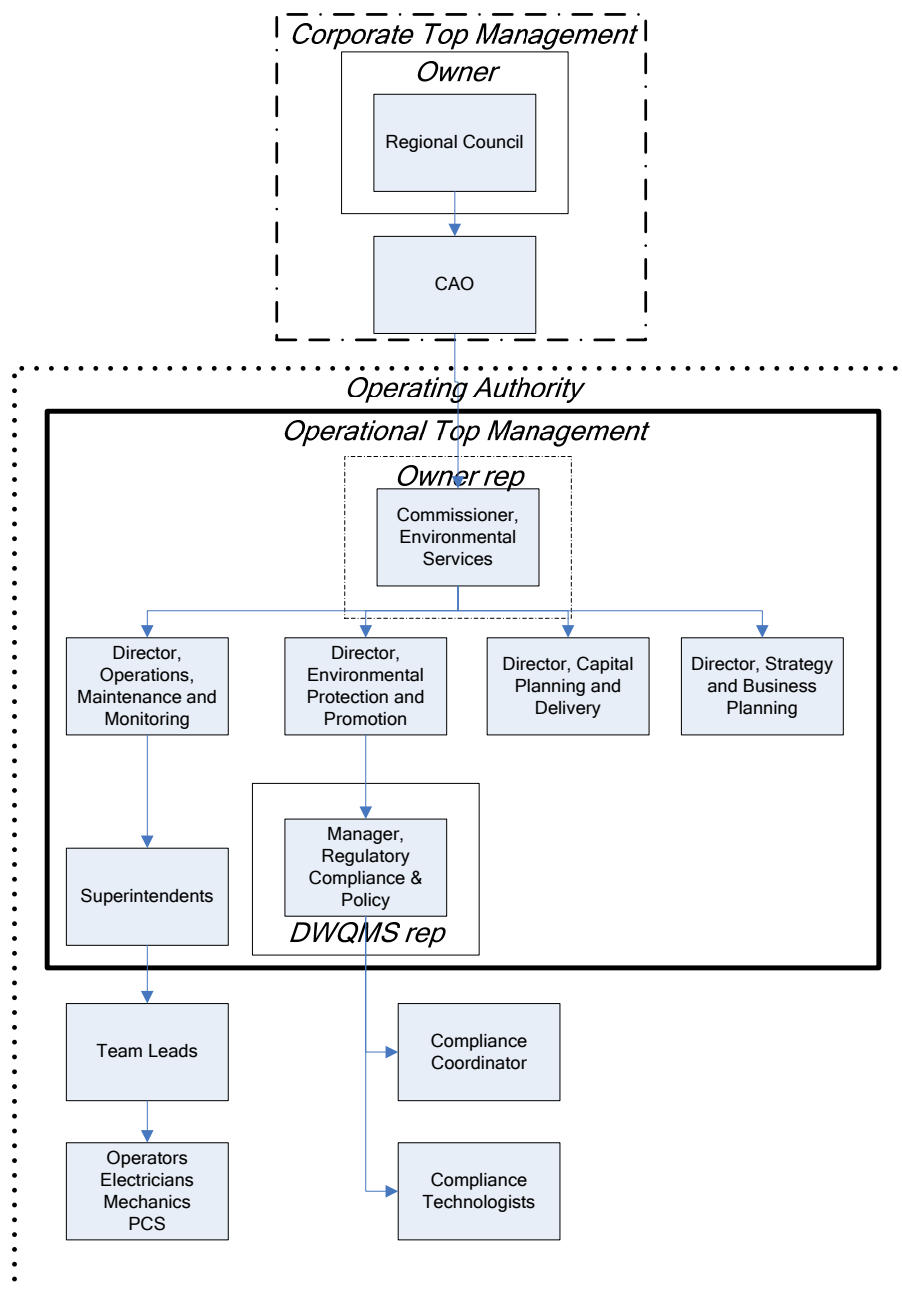


FIGURE 1: ROLES AND RESPONSIBILITIES IN THE DWQMS

3.0 DRINKING-WATER SYSTEM PERFORMANCE

3.1 INCIDENTS OF REGULATORY NON-COMPLIANCE (A)

All regulatory non-compliances, identified during the MOE inspection process, will be reported during management review. These results help Operational Management identify regulatory deficiencies in our drinking-water systems.

TABLE 1: MOE INSPECTIONS (JANUARY TO OCTOBER 2008)

<i>Year:</i>	<i># MOE Inspections Completed:</i>	<i># Non-Compliance Findings:</i>	<i># Best Practice Recommendations:</i>
2008	9 (to date)	0	6

Additional MOE inspections have occurred this year, however inspection reports have not been received from the MOE.

A summary of findings and recommendations is maintained by the Regulatory Compliance and Policy group in “MOE – Drinking Water Inspection Reports for 2008.”

3.2 INCIDENTS OF ADVERSE DRINKING-WATER TESTS (B)

To assist in the detection of real-time issues in the drinking-water systems, programs exist such as online monitoring through SCADA, and a rigorous sampling program scheduled in SiteFX. These testing and monitoring methods verify the quality of the drinking water. All adverse drinking-water test results will be reported during management review.

TABLE 2: SUMMARY OF DRINKING-WATER TESTS (JANUARY TO OCTOBER 2008)

<i>Year:</i>	<i>Parameter:</i>	<i>Quarter 1</i>	<i>Quarter 2</i>	<i>Quarter 3</i>	<i>Quarter 4</i>	<i>Total</i>
2008	# of reported adverse (Bac-T)	0	0	0	Not available	0 (to date)
	# of reported adverse (all other parameters*)	5 (sodium)	1 (combined Cl residual)	0	Not available	6 (to date)

*All other parameters as required by Schedules 1, 2 and 3 in O.Reg. 169/03, and Schedules 6, 10, 23 and 24 in O.Reg. 170/03.

3.3 ADVERSE DRINKING-WATER TESTS ARE REPORTED IN THE ADVERSE DATABASE BY OPERATIONS, MAINTENANCE AND MONITORING STAFF. DEVIATIONS FROM CRITICAL CONTROL POINT (CCP) LIMITS AND RESPONSE ACTIONS (c)

A critical control point (CCP) is considered an essential step or point in the subject system where you apply some sort of control, to prevent or eliminate a drinking-water health hazard or to reduce it to an acceptable level. In York Region's drinking-water systems, CCPs include, but are not limited to:

- primary disinfection;
- secondary disinfection;
- system pressure; and
- turbidity (for surface water).

A critical control limit is considered the point at which a response procedure is initiated for each CCP.

CCPs and limits were established for each drinking-water system facility through the risk assessment exercise. CCPs are monitored and tracked through the SCADA system and responded to using the Operating and Emergency Procedures.

In all cases where there was a possibility of improperly disinfected water being directed to users, the system functioned properly to lock-out the treatment process, record the information in the SCADA system and operators responded to the alarm. If there was an adverse sample received, operators used the operating and emergency procedures and responded as required to the MOE and other parties.

As a key performance indicator (KPI) for 2009, a report will be generated from the SCADA system trending the information. The identified priority for the Operations, Maintenance and Monitoring is the length of time a lockout occurs based on chlorine residual.

3.4 OPERATIONAL PERFORMANCE (g)

The operational performance section of management review will be used to cover operational performance parameters that are tracked and measured in our drinking-water systems, but have yet to be reported on. A number of health-related water quality parameters will be reported. There are many operational control measures that are in place to assist in maintaining peak performance of our drinking-water systems and to ensure regulatory requirements and stakeholder expectations are met.

TABLE 3: OPERATIONAL PERFORMANCE OF YORK REGION DRINKING-WATER SYSTEMS

		Q1	Q2	Q3	Q4	YTD
PUBLIC HEALTH PARAMETERS						
Health related water quality parameters	Turbidity - average value for turbidity (NTU) (Objective: < 1 NTU)	0.327	0.333	0.315	-	
	THMs - average value for THMs (mg/L) (MAC: 0.100 mg/L)	0.018	0.058	0.021	-	
	Coliforms - number of occurrences with TC counts (P/A) (MAC: absent/not detected)	0	0	-	-	
	Nitrates - average value for nitrates	0.273	0.941	0.277	-	

		Q1	Q2	Q3	Q4	YTD
	(mg/L) (MAC: 10 mg/L)					
	Lead - average value for lead (mg/L) (MAC: 0.01 mg/L)	0.0006	0.0005	0.0002	-	
	Boil water advisories - number issued by York Region	0	0	0	-	
OTHER PARAMETERS (TARGET: 100% OF TRAINING COMPLETED BY YEAR END)						
Training	Percentage of staff meeting York Region training requirements of 50 hours per year (by quarter) (Target 100%)	10%	22%	17%	-	49%

3.5 RAW WATER SUPPLY AND DRINKING WATER QUALITY TRENDS (H)

As part of each Municipal Drinking Water Licence (MDWL) application, York Region is required to provide information pertaining to raw water supply and drinking water quality trends. This information should identify key water quality issues that need to be addressed by Operational Management.

TABLE 4: RAW WATER SUPPLY AND DRINKING WATER TRENDS

Hub:	Raw Water Source:	Location:	Summary of Water Trends:
1	Surface Water	Georgina	No significant changes in trends to date
		Keswick	No significant changes in trends to date
2	Groundwater	Ballantrae	- Steady water quality trends for past 10 years - Slight increasing trend of chloride (Cl) and sodium (Na)
		Mount Albert	- Slight increasing trend of Cl and Na - Manganese (Mn) a source of odour and colour
		Stouffville	- Shallow aquifer (Oak Ridges) shows elevated Cl, Na, nitrate and sulphate - Deep water quality trends steady
3	Groundwater	Ansnoerveldt	- Different geochemistry than other areas in YSA - Naturally higher in Na, lowest hardness in York Region - Distinct difference between levels in wells, but trends are parallel and steady - Odd NOx trend – could have resulted from sampling error
		Holland Landing	- Deep water quality steady trends, dropping pH and slight rise in Na - Trihalomethane (THM) rise in treated water since Q1, 2005

<i>Hub:</i>	<i>Raw Water Source:</i>	<i>Location:</i>	<i>Summary of Water Trends:</i>
		Queensville	• THM rise in treated water since Q1, 2005 • Deep water quality steady trends but clear difference between wells 1, 2 and 3, 4
		Newmarket	• Shallow aquifer (Oak Ridges) shows elevated Cl, Na, nitrate and sulphate, dropping pH (Well 14) • Deep water quality steady trends
4	Groundwater and Surface Water	Aurora	• Observing a steady decrease in pH since 1999 • Sulphates in Well 5 higher than any other location (different aquifer) • All other “natural” parameters are steady • No observed human influence (applied chemicals or road salt) • Recovering aquifers (Feed from Toronto and Peel)
		King City	• “Roller coaster” pH trend • May be seeing a human caused influence in the Na and Cl trends for Well 3 • Minor increase in sulphates • Other natural parameters steady, no human caused changes
5	Groundwater	Kleinburg	• THM increase in treated water since Q1, 2004 • Deep water quality steady trends • Cl being monitored in Wells 3, 4 as per PTTW • Nitrate/nitrite spike Q1, Q2, 2007 (Well 2)
		Nobleton	• THM fluctuations in treated water since Q1, 2004 • Higher sulphate and increasing Cl (Well 3) • Overall drop in pH
		Schomberg	• Steady water quality trends for natural parameters • Overall drop in pH • Drop in Na in Q1, 2004 (Well 3) • Spike in sulphates every so often for Well 2 • Increase in THMs for treated water since Q2, 2004
6, 7	Surface Water	York Water System	• No raw water supply in the York Water System • Treated water supplied by the City of Toronto and Region of Peel

NOTE: Future reviews will include detailed charts summarizing raw water supply and drinking water quality trends.

3.6 CONSUMER FEEDBACK (L)

Element 12 “Communications” requires the development of a procedure for communications with various levels of the organization and its’ stakeholders. This section of management review will provide a summary of communication received from our consumers regarding water quality.

- One water quality-related communication in 2008. It was reported during the previous ISO Management Review Meeting in July 2008. A summary of the communication is below:
 - A resident was concerned about water quality in Stouffville, as material was building up on treatment system filter, iron stains in toilet bowl, etc. (reference ISOsoft Environmental Incident #00086). A sodium silicate optimization study was initiated in response (reference ISOsoft PAR #468).
 - A sodium silicate study was completed by OMM. It was recommended that some facilities adjust their sodium silicate addition based on the study results.

All communication received from consumers is documented on External Concern and Response Forms, which are managed by the Regulatory Compliance and Policy group in ISOsoft.

4.0 MANAGEMENT SYSTEM PERFORMANCE

4.1 THE RISK ASSESSMENT PROCESS (D)

Element 7 of the DWQMS requires a risk assessment process be documented that identifies potential hazardous events and associated hazards then assesses and ranks risks related to each hazardous event. Furthermore, control measures must be identified and critical control points must be realized. Reliability and redundancy of equipment must also be considered. The currency of information and assumptions used in the risk assessment process must be verified annually and a re-assessment of the risks in the drinking-water systems must occur every 36 months.

Where possible, risk assessment processes used in existing programs [i.e. the Infrastructure Improvement Program (IIP)] were incorporated into the DWQMS. Despite their differences (DWQMS: event-driven risks vs. IIP: probability of equipment failure), the risk assessment process is comparable.

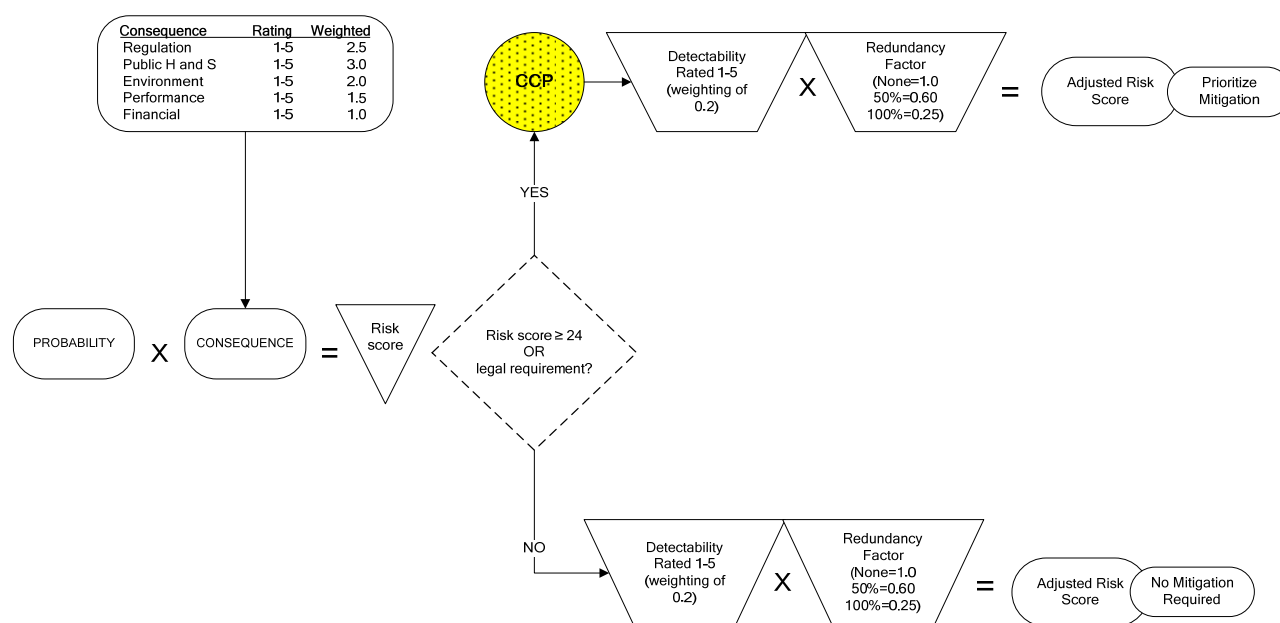


FIGURE 2: RISK ASSESSMENT FLOW CHART

The risk assessment database contains all drinking-water facilities and their associated risks. The database was created and is maintained by the Regulatory Compliance and Policy group. A sample of information contained in the database is located in Appendix A.

4.2 INTERNAL AND THIRD-PARTY AUDITS (E)

The DWQMS requires each Operating Authority to implement a procedure that ensures internal audits are conducted at least once every 12 months to evaluate conformance to the Standard. York Region's Operational Plan specifies that each drinking water system facility is audited internally once every three years. A procedure has been developed that outlines aspects of the internal audit process (i.e. scheduling, audit preparation, conducting the audit and reporting results).

All internal and third-party audit results will be communicated during management review.

4.2.1 INTERNAL AUDITS

A series of internal audits were conducted in October and November 2008. Most elements of the DWQMS were reviewed, except elements 19 and 20. A summary of the audit results are below:

TABLE 5: INTERNAL AUDIT RESULTS

<i>DWQMS element:</i>	<i>Internal Audit Results:</i>	<i>Status:</i>
<i>Element 2 – QMS Policy</i>	Currently, a Quality Policy has not been finalized	A consultant has been hired to consolidate all policies (9001, 14001, DWQMS).
<i>Element 4 – QMS Representative</i>	A Quality Management Representative (QMR) has been appointed, however there is a lack of communication to staff	Communication will be developed to notify staff of the QMR appointment.
<i>Element 5 – Document and Records Control</i>	Documents reviewed (i.e. drinking-water system descriptions and training matrix) were inaccurate or had no document control measures	A thorough review of documentation identified in the internal audits will be completed.
<i>Element 13 – Essential Supplies and Services</i>	A list of essential supplies and services has not been finalized, and suppliers have not been contacted	A list of Essential Suppliers has been developed (draft). Suppliers will be contacted to inform them of new requirements from DWQMS.
<i>Element 15 – Infrastructure Maintenance, Rehabilitation and Renewal</i>	Issues with the implementation of the Computerized Work Management System (CWMS), Maximo	Projects are underway to rectify current issues with Maximo.
<i>Element 16 – Sampling, Testing and Monitoring</i>	Upstream sampling points missed in documentation	A thorough review of documentation identified in the internal audits will be completed.
<i>Element 18 – Emergency Management</i>	Documents and processes referenced in this section are not available or have not been completed	Documents have been developed, Op. Plan updates are required. Action items are assigned for incomplete processes.

4.2.2 THIRD-PARTY AUDITS

The Canadian General Standards Board (CGSB) has been contracted by the MOE to complete the accreditation audits. Our Quality Management System has not been audited by a third-party for accreditation to the DWQMS. The CGSB suggested that the initial round of audits will occur approximately six to eight weeks after submission of the Operational Plan (i.e. mid to late February).

4.3 EMERGENCY RESPONSE TESTING (F)

Element 18 of the DWQMS is Emergency Management. An emergency is considered a potential situation or service interruption that may result in the loss of the ability to maintain a supply of safe drinking water. The DWQMS requires the Operating Authority to maintain a state of emergency preparedness. There are approximately 30 procedures that have been developed to effectively handle emergency situations in our drinking water systems.

Several methodologies have been identified to train staff and test emergency procedures including:

- large-scale mock emergency testing of procedures related to a specific event
- small-scale, localized emergency testing that audits a specific procedure
- requirement for Operations and Maintenance staff to review all emergency procedures annually during the “Emergency Procedures Annual Review and Sign-Off” (required by December 31st of each calendar year and tracked in ISOsoft)

Results of emergency response testing will be reported during management review.

4.3.1 EMERGENCY TEST: DIESEL FUEL DELIVERY

On July 29, 2008, a mock test of the emergency diesel supplier “4Refuel” was conducted. The sites chosen for fuel delivery were Stouffville Wells 5 and 6. These sites were chosen because they are more remote than facilities in the southern end of the Region. 4Refuel stated that they are able to supply fuel within 2 hours of an emergency call. At the conclusion of the emergency test, 4Refuel was unable to provide diesel in a reasonable time (within 2 – 3 hours). An internal meeting was held on October 29, 2008 to review the emergency test results and action items include:

- schedule a meeting with representatives from 4Refuel to review the results from the emergency test and determine next steps;
- review existing procedures to determine whether the procedures specify when to order diesel fuel;
- research options for 24-hour emergency diesel supply beginning in 2009; and
- determine the preferred amount of fuel to be stored at each facility to ensure adequate supply in emergencies.

A report was written that contains details from the emergency test and timelines. The report is located in ISOsoft. The report is included in Appendix B.

4.4 ACTION ITEMS FROM PREVIOUS MANAGEMENT REVIEWS (i)

Action items from management review meetings are initiated to address deficiencies in the Quality Management System. At each management review, the status of action items from previous management reviews will be reported.

- This is the inaugural DWQMS management review, therefore there are no actions items from previous management reviews

4.5 STATUS OF OTHER MANAGEMENT ACTION ITEMS IDENTIFIED BETWEEN REVIEWS (j)

In addition to action items generated through the management review process (Element 20 i), other management action items, identified between management reviews, to address deficiencies in the management system, will be reported at each management review.

- One action item was generated in July 2008 regarding how QMS performance parameters are reported to add value and improve effectiveness (i.e. include MAC limits, report per capita usage in L, etc.) These suggestions have been reflected in performance parameters reported in this management review.

4.6 CHANGES THAT COULD AFFECT THE QUALITY MANAGEMENT SYSTEM (k)

Similar to the management review requirements in ISO 9001 and 14001, the 'changes that could affect the QMS' allows for discussion of changes that have occurred within the organization or management system over the review period. This section provides an opportunity to report plans for the management system and program updates.

Organizational Changes:

- Re-organization of the Environmental Services department, modifying the roles and responsibilities outlined in the DWQMS
- Coordinate with the Operations, Maintenance and Monitoring (OMM) group to develop key performance indicators for tracking in the management systems
- The management systems rely on programs that are managed by parties outside of the Regulatory Compliance and Policy group, changes to those programs need to be communicated to the management system administrators (i.e. SiteFX, Maximo, IIP, etc.)

Management System Plans and Program Updates:

- Changes to the management system may be recommended during CGSB accreditation audits
- Upgrade from ISOsoft to Intalex 5 (software for management systems)
- Develop administrative procedures for the management systems, some have been created for the DWQMS
- Integration plans for the DWQMS with the existing ISO 9001 QMS and ISO 14001 Environmental Management System (EMS) (including the implementation of an Environmental Management System for select Solid Waste facilities)

4.7 RESOURCES TO MAINTAIN THE DWQMS (M)

Resources are broadly defined as those things needed to implement and maintain the management systems – they include human, physical work environment and financial resources. As part of the maintenance and continual improvement of the DWQMS, resources required to run the system will be discussed at management review.

- Resources in Regulatory Compliance and Policy (2008) that help to maintain the existing management systems:
 - Manager, Regulatory Compliance and Policy
 - Compliance Coordinator (1 PFT)
 - Compliance Technologists (2 PFT, 2 TFI)
 - ISO Student (1 TFI)
 - Internal Auditors (5 from Operations, Maintenance and Monitoring)
- Request for a Program Manager in Regulatory Compliance and Policy (2009)
 - May submit other requests for human resources
- Existing resources in Operations, Maintenance and Monitoring (OMM):
 - Management staff: 1 Director, 3 Superintendents, 2 Program Managers
 - 51 Certified Operators (including Casual staff)
 - 11 Mechanical/Electrical staff
 - 3 PCS/SCADA staff
 - 6 Project Coordinators/Asset Inspectors
 - 4 Administrative staff
- Intelix 5 upgrade
 - No changes to software maintenance fees, unless user access levels are modified
 - Incur less than \$10,000 in training fees
- Costs to train staff on the use/maintenance of programs used in the DWQMS (i.e. SCADA, SiteFX, Risk Assessment database, Intelix 5, etc.)

4.8 INFRASTRUCTURE REVIEW (N)

Elements 14 and 15 of the DWQMS require a documented procedure for infrastructure review to ensure adequate infrastructure is in place to operate and maintain the drinking water systems. A summary of York Region's infrastructure maintenance, rehabilitation and renewal programs are also required to be documented. The Environmental Services Department has extensive infrastructure management programs, such as the Infrastructure Improvement Program (IIP) and Maximo. This section of management review will be used to report on system reliability, system capacity and an update from the IIP.

TABLE 6: DRINKING WATER SYSTEM INFRASTRUCTURE

		Q1	Q2	Q3	Q4	YTD
SYSTEM RELIABILITY						
Maintenance	Number of scheduled Preventive Maintenance work orders	4,678	4,204	4,680	-	13,562
	Percentage of Preventive Maintenance work orders completed on time	86%	80%	87%	-	84%
	Number of Preventive Maintenance work orders identified as unplanned/unscheduled (by Reported Date)	429	695	807	-	1,931
Watermain breaks	Watermain breaks	0	1	1	-	2
	Watermain breaks caused by incorrect stakeout	0	0	0	-	0
SYSTEM CAPACITY						
Water restrictions	Days with water restrictions	0	0	0	-	0
Demand	ML distributed	27,814	30,125	-	-	57,939
	Per capita demand (L/day)	280	300	-	-	290
INFRASTRUCTURE IMPROVEMENT PROGRAM						
**FUTURE REPORTS TO INCLUDE PROJECT DETAILS INCLUDING START DATE, COMPLETION DATE, REASON FOR DELAYS, ETC.						
Number of water projects to start in 2008 (scheduled)		April start (scheduled)	August start (scheduled)		December start (scheduled)	
14		6	5		3	

Infrastructure Improvement Program project information is maintained by Strategy and Business Planning staff.

4.9 OPERATIONAL PLAN: CURRENCY, CONTENT, UPDATES (O)

The DWQMS requires an Operating Authority to document a QMS for each drinking-water system in the form of an Operational Plan. The Operational Plan is required by the Director's Direction; therefore it must be submitted to the MOE for acceptance. Essentially, the Operational Plan is the document that describes how the Regional Municipality of York plans to meet the requirements of the DWQMS. It is then the responsibility of the Operating Authority to implement the plan.

Currently, the Operational Plan developed by York Region is in final draft. The plan is open for comments from management and key personnel in the Operating Authority until November 28, 2008. From November 28 to December 5, all comments will be incorporated into version 1 of the Operational Plan. Version 1 will be endorsed, on behalf of the Owner, by the Commissioner of

Environmental Services, Erin Mahoney, prior to submission to the MOE. The target submission date is December 12, 2008. Ontario Regulation 188/07 requires submission on January 1, 2009. An information report for Regional Council is scheduled in February 2009.

5.0 STAFF SUGGESTIONS, RECOMMENDATIONS FOR IMPROVEMENT (P)

Staff suggestions and recommendations for improvement is an integral part of the management review process.

- Research technology options to help administer the QMS (e.g. document management, mobile computing “air cards” for tablets)
- Develop communication material for internal and external stakeholders to improve confidence in the safety of drinking-water, provide direct links to how a management system helps
- Host a KnowYork session, an open house and develop information for the York Works newsletter about the DWQMS
- Implement Root Cause Analysis procedures to address key areas of concern for DWQMS administration
- Revisit ‘Operational Top Management’ to determine whether to include the Directors of Strategy and Business Planning and Capital Planning and Delivery (NOTE: completed December 2008)
- Determine needs for SCADA information required for reporting deviations from CCPs
- Future reviews will include an overview of suggestions from operations staff

6.0 NEXT MANAGEMENT REVIEW MEETING

- The next Management Review Meeting will consist of elements from all management systems we are registered/accredited to (i.e. ISO 9001, ISO 14001, DWQMS)
- The 2009 meetings are not yet scheduled, however the plan is to schedule management reviews in the first quarter (Q1: to review previous year) and third quarter (Q3: to review Q1 and Q2 of current year)

APPENDIX A - SAMPLE RISK ASSESSMENT FOR AURORA WELLS 1 - 4

The Regional Municipality of York
Environmental Services - Regulatory Compliance and Policy

Hazard Analysis Report

Aurora Well No.1,2,3,4 (Main Plant)																
Area	Process	Hazard	Haz Description	Comment	Probability	Consequence					Legal Req't	CCP	Detectability	Redundancy	Adjusted Risk Score	Mitigation Measures
						Legal	Public H.S	Environmental	Performance	Financial						
Analyzers/Meters	Chlorine Analyzers	Control	Improper readings	Out of calibration	4	2	5	1	1	1	✓	39.20	3	1	23.520001	Influent Free Asset # 2019
Analyzers/Meters	Chlorine Analyzers	Physical	Reagent runs out	No longer test Cl levels	1	2	5	1	1	1	✓	9.800	1	1	1.9600001	Infl Free CL LL=.50 LA=.6
Analyzers/Meters	Chlorine Analyzers	Control	PC board malfunctions		1	2	5	1	2	2	✓	10.80	1	1	2.1600001	SCADA Status Fail Alarm
Analyzers/Meters	Flow Meters	Control	PC board malfunctions		1	2	5	1	2	2	□	10.80	1	1	2.1600001	
Analyzers/Meters	Flow Meters	Control	Improper readings	Out of calibration	1	2	3	1	2	1	□	8.000	3	1	4.8000001	
Analyzers/Meters	Flow Meters	Control	Signal failure	SCADA/Chemical flow paced	4	1	5	1	1	1	□	35.20	1	1	7.0400002	SCADA Signal Failure Alar
Analyzers/Meters	Turbidity meters	Physical	Build up	Lack of Maintenance/cleaning	3	1	2	1	1	1	□	15.60	1	1	3.1200001	
Analyzers/Meters	Turbidity meters	Control	Improper readings	Out of calibration	3	1	2	1	1	1	□	15.60	3	1	9.3600003	
Analyzers/Meters	Turbidity meters	Control	PC board malfunctions		1	1	1	1	2	2	□	5.000	1	1	1.0000000	
Chemical Addition	Ammonia	Physical	Pump Failure	Dosing Stops	2	2	1	1	2	2	✓	12.00	1	0.25	0.6000000	SCADA Status Fail Alarm
Chemical Addition	Ammonia	Chemical	Mix Wrong concentration	Manually measured and mixed	3	1	1	1	1	1	✓	12.00	5	1	12.0000000	Mixing Instructions Locate
Chemical Addition	Ammonia	Physical	Miltonic's failure	Level not accurately measured	1	1	1	1	1	1	✓	4.000	1	0.25	0.2000000	Monitored by SCADA
Chemical Addition	Ammonia	Physical	Mix Motor failure		2	1	1	1	3	2	✓	11.20	3	1	6.7200002	Mix Motor Located On Eac
Chemical Addition	Ammonia	Physical	Run out of Chemical	Chemical tanks not filled/ordered	3	1	1	1	1	1	✓	12.00	1	1	2.4000001	Ammonia Tank Level Alar
Chemical Addition	Chlorine Gas	Physical	Weigh Scale malfunction	Run out of chemical	4	1	5	1	1	2	□	36.80	3	0.25	5.5200002	Weigh Scale (kg) LL10.00
Chemical Addition	Chlorine Gas	Physical	Capital Control Malfunction		3	2	5	1	2	2	✓	32.40	1	0.25	1.6200000	Infl Free CL LL=.50 LA=.6
Chemical Addition	Chlorine Gas	Physical	Booster Pumps Fail	Lack of chemical feed	3	2	5	1	4	2	✓	36.00	1	0.25	1.8000001	SCADA Status Fail Alarm
Chemical Addition	Chlorine Gas	Physical	Venturi Malfunction (Injector)		1	2	5	1	2	2	✓	10.80	4	0.25	2.1600001	Infl Free CL LL=.50 LA=.6
Chemical Addition	Chlorine Gas	Chemical	Wrong Chemical injection into raw water	Delivered/Ordered wrong Chemical	1	4	5	2	3	2	✓	14.20	4	0.5	5.6800002	Infl Free CL LL=.50 LA=.6
Chemical Addition	Chlorine Gas	Chemical	Regulator Malfunction/Leak	To little disinfection	3	2	5	2	2	2	✓	34.80	1	0.25	1.7400001	Infl Free CL LL=.50 LA=.6
Chemical Addition	Silicate	Physical	Underground tank infiltration	Ground water Contamination	1	1	1	1	4	2	□	6.200	3	1	3.7200001	
Chemical Addition	Silicate	Physical	Injector failure	Clog	2	1	1	1	2	1	□	9.200	3	0.25	1.3800000	
Chemical Addition	Silicate	Physical	Chemical Pumps fail	Dosing stops	2	1	1	1	2	2	□	10.00	1	0.25	0.5000000	
Chemical Addition	Silicate	Physical	Pipes Clog	Lack of Maintenance	3	1	1	1	1	2	□	13.20	3	0.25	1.9800001	
Chemical Addition	Silicate	Physical	Underground tank penetration	Animals, chemical	1	1	1	1	3	2	□	5.600	4	1	4.4800001	
Chemical Addition	Silicate	Physical	Run out of Chemical	Chemical tanks not filled/ordered	3	1	1	1	1	1	□	12.00	3	1	7.2000002	
Communications	SCADA	CADA Failure	Communication Tower malfunctions	Communication	3	1	2	1	1	1	□	15.60	1	1	3.1200001	
Contact Chamber	Contact Chamber	Physical	Sludge/Iron Build up	Contaminated water	1	1	1	1	2	1	□	4.600	5	1	4.6000001	
Contact Chamber	Contact Chamber	Physical	Chamber integrity	Infiltration	1	3	5	1	4	4	□	13.80	4	1	11.0400000	
Plant General	Employees	physical	Cross contamination	Multiple disciplines	1	1	3	1	2	1	□	7.000	5	1	7.0000002	
Plant General	Security	mical/Biolog	Intentional contamination of water Source	Terrorism attack	1	3	5	1	4	3	□	13.40	2	1	5.3600002	
Plant General	Security	Physical	Damage to Process equipment	Equipment damage due to break in	1	1	2	2	4	3	□	8.600	3	1	5.1600002	
Pumps	Pumps	Chemical	Contamination	Contamination due to Maint./grease, oil etc.	1	1	1	1	1	1	□	4.000	5	0.5	2.0000001	
Pumps	Pumps	Chemical	Shaft lubrication contamination		1	1	1	1	3	3	□	6.000	4	0.5	2.4000001	
Pumps	Pumps	Physical	Air Vent Open to air	Possible contamination	1	1	1	1	2	1	□	4.600	5	0.5	2.3000001	
Source	Raw Water	Chemical	Accidental Chemical Spill (Off site)	Contaminated Raw Water	1	3	5	3	4	1	□	14.20	3	1	8.5200003	
Well	Raw Water	Physical	Screen Integrity failure	Particulate in Raw Water	2	1	1	1	4	4	□	14.00	3	0.5	4.2000001	

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APPENDIX B – EMERGENCY TEST REPORT

Diesel Delivery Mock Emergency Test

July 29, 2008

2100Hrs

Purpose

In accordance with Element 4.4.7 Emergency Preparedness and Response, section 4.3, we are required to conduct an annual emergency test in the form of a questionnaire, fire drill or mock emergency test.

For this event a Mock Emergency Test was conducted to assess the timelines of 4Refuel Ltd. (Emergency Diesel Supplier) to deliver diesel to a pre-determined facility as per the Diesel Storage Tank Filling Procedure (Rev 7).

Site(s)

The emergency test was conducted at Stouffville Wells 5 and 6 on Hwy 48.

Pre-test actions

To confirm that testing of the emergency diesel supplier was not in violation of contract terms, Supplies and Services was contacted to obtain contract details. An official contract could not be provided as the contract with 4Refuel was an informal Request for Quotation initially obtained in 2006 4Refuel was contacted in order to give them prior notice that we would be conducting an emergency test in the near future. Two messages were left to contact Marc Simmons (YR) regarding the test, response from a 4Refuel representative was never received. It was decided to proceed with emergency testing.

Overview - Event Scenario and Timelines

The Control Panel operator received a “power fail” alarm and a “diesel run” alarm. Operator is called out to Stouffville Wells 5 and 6 after hours as there is an unexpected power outage in the area. Operator arrives on site to monitor the diesel generator operation and notices that the volume of diesel fuel is low and requires an emergency diesel delivery. The operator follows the Diesel Storage Tank Filling Procedure.

Exercise Timeline

Sequence of Events		
Step No.	Activity	Estimated Time
1	Station Operator and Compliance representative arrive on site Notifies control panel operator of the diesel test	20:45
2	Station Operator cuts power to station to simulate actual power failure	21:00
3	Diesel starts after 30 second power fail delay	21:00:30
4	Diesel generator starts up and power to station restores, pumps start	21:01

5	Call #1 is made to 4Refuel 1-888-473-3835 Call is answered by switchboard and transferred to local distributor Message left on distributor voice mail	21:02
6	No calls have been received by distributor	21:16
7	Call #2 is made to 4Refuel 1-888-473-3835 Call is answered by switchboard and transferred to local distributor Message left on distributor voice mail	21:17
8	Received call from distributor Advised that a fuel supply was required at the Stouffville wells 5 and 6 Distributor informed me that their area was for the downtown Toronto area and gave me the Mississauga dispatch number to call (905) 501-0922	21:30
9	Call #3 made to Mississauga Dispatch (905) 501-0922 Left message	21:31
10	Call #4 made to Mississauga Dispatch (905) 501-0922 Answered by Mississauga dispatcher, informed me that they were on their way in to the office and that they will call me back in 15 minutes (cell phone reception was not good)	22:00
11	Call #5 made to Mississauga Dispatch Requested diesel delivery to Stouffville Informed me that there was no one in the area who could deliver until at least 04:00 the next morning. Explained it was an emergency and that fuel was needed ASAP Informed me that she will have to speak to the operations manager and will get back to me in 15 minutes	22:30
12	Received call from dispatcher Operations manager confirmed that a delivery will not be available until the next morning. Advised that if we were located in Brampton or similar it wouldn't be a problem Informed her that that will be too late and that we will attain diesel by another means	22:40
13	Transferred station back to hydro power, shut down diesel generator	22:45
14	Completed Logbook entries	22:50
15	Left Station	23:00

Participants and Observers

Name: Justin Quail, Hub 2 Operator

Name: Marc Simmons, Compliance Technologist

Reference Documentation

The reference documents used to produce this exercise/drill are:

Diesel Storage Tank Filling Procedure

Diesel Test Run Procedure – Wells and water Pump Stations

Summary

In summary 4Refuel was not able to deliver diesel in a timely manner.

Currently as per ISO procedure “Diesel Storage Tank Filling Procedure” there are two contingency plans:

1. The maintenance crew has a vehicle with a portable fuel tank and are able to pick up fuel from a fuel station and deliver to the facility in need;
2. If fuel stations are offline (i.e. August 2003 black out) maintenance has the ability to pump fuel from either Leslie PS or Aurora PS diesel tanks to the portable tank and deliver fuel where needed.

It is recommended that the “Diesel Storage Tank Filling Procedure” be reviewed and a meeting be held with Kevin Quinn (Operations Liaison), Brett Bloxam (Director of Operations and Maintenance), Don Francis (Superintendent Maintenance) and a representative from 4Refuel to discuss details of what occurred on the test night so that a formalized contract can be developed detailing what is expected during emergency events.