



CORPORATION OF THE CITY OF PEMBROKE



2011 D.W.Q.M.S. Management Review Report

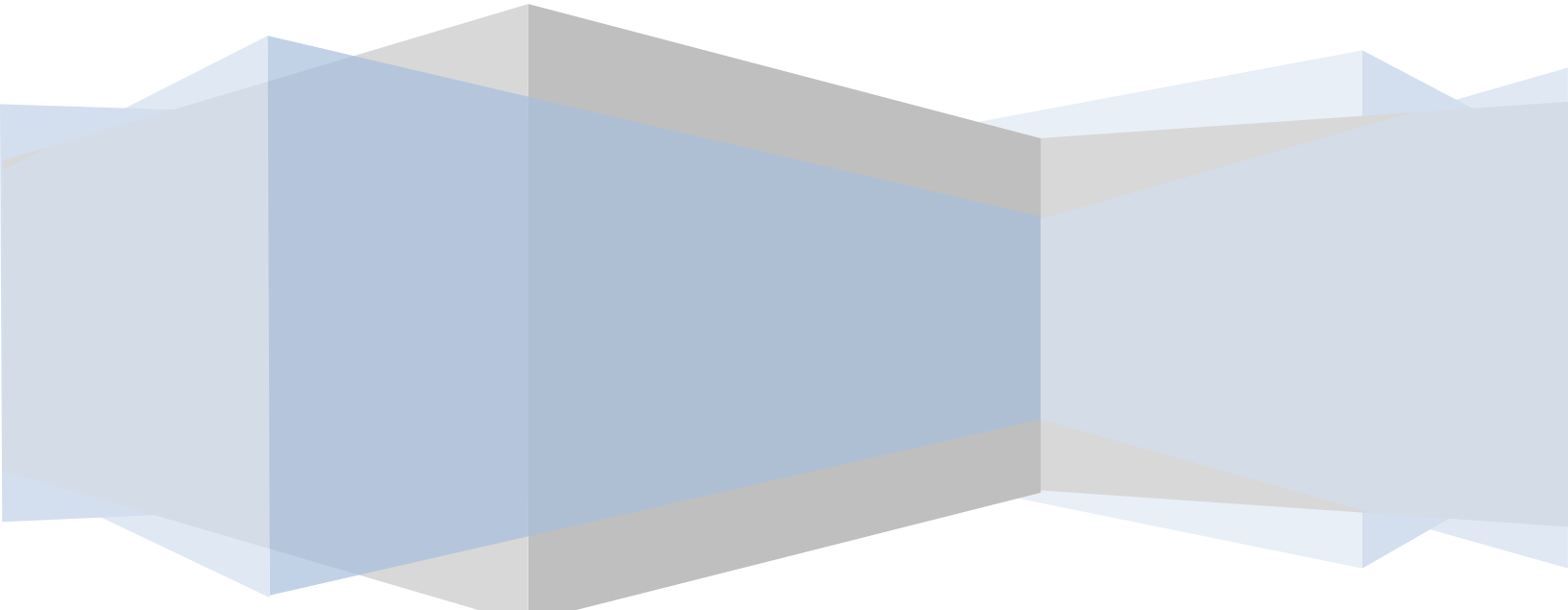




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1.0 INTRODUCTION TO DWQMS MANAGEMENT REVIEW

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).

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 following is a summary of information that Top Management must review annually in accordance with the Ontario DWQMS. The current review considers the entire 2011 calendar year (the “review period”) and where appropriate, touches on activities continuing in 2012. The following 16 aspects must be considered in the annual review:

The standard requires that input into management review include:

- 1) incidents of regulatory non-compliance
- 2) incidents of adverse drinking-water tests
- 3) deviations from critical control point (CCP) limits and response actions
- 4) the risk assessment process
- 5) internal and third-party audits
- 6) emergency response testing
- 7) operational performance
- 8) raw water supply and drinking water quality trends
- 9) action items from previous management reviews
- 10) status of other management action items
- 11) changes that could affect the quality management system
- 12) consumer feedback
- 13) resources to maintain the DWQMS
- 14) infrastructure review
- 15) operational plan: currency, content, updates
- 16) staff suggestions, recommendations for improvement

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



2.0 EXECUTIVE SUMMARY

A requirement of the Ontario Drinking Water Quality Management Standard (DWQMS) Operational Plan is for the Quality Management System (QMS) Representative to ensure annual management review results are conveyed to Top Management and the Owner (Council). This report fulfills that requirement.

This report contains a summary of information that Top Management must review annually in accordance with the Management Standard.

The DWQMS is the key tool that supports and ensures that Council, as the Owner of the drinking water systems, is meeting its duties and responsibilities under the *Safe Drinking Water Act* and Standard of Care.

The DWQMS has been designed for continual improvement, which is the foundation of the DWQMS Policy endorsed by Top Management and Council. The current review considers the entire 2011 calendar year (the "review period") and where appropriate, touches on activities continuing in 2012.

The DWQMS sets out a mandatory list of 16 issues to be examined during annual reviews and reports.

The detailed results have been reviewed by Top Management in accordance with the DWQMS management review system procedure.

Highlights of the review findings are:

- The City's Drinking Water System scored 100 per cent across the board after a detailed Ministry of the Environment inspection;
- The water quality testing program meets or is better than regulations;
- Maintenance procedures are appropriate;
- Shortcomings are being addressed.
- The operator certification program is working; and
- Staff is following procedures and showing a commitment to continual improvement.

In short, the 2011 Management Review shows the DWQMS is being implemented successfully and reinforces the fact that the City of Pembroke produces and supplies high quality, safe drinking water.



3.0 BACKGROUND

On November 18, 2009, City Council endorsed the City's QMS also known as the (Operational Plan), which is in conformance with Ministry of Environment standards.

On October 6, 2010, The City of Pembroke was advised that it had been successful in meeting the requirements of Ontario's Drinking Water Quality Management Standard to the satisfaction of the CGSB Accreditation Program for Operating Authorities and would be awarded a Limited Scope – Entire accreditation (Drinking Water Quality Management System: Operational Plan # 198-401)

The Limited Scope – Entire Accreditation Certificate was issued subject to the condition that the City of Pembroke submits an application for Full Scope – Entire DWQMS Accreditation. Full Scope Accreditation is based on a system audit and on-site verification audit of the DWQMS Elements.

The City of Pembroke filed application for Full Scope – Entire Accreditation on September 29, 2011.

Also during the calendar year 2011, under O. Reg. 188/07, the City of Pembroke was required to obtain a Drinking Water System License. The City was issued Municipal Drinking Water License # 198-101 & Drinking Water Works Permit # 198-201 on March 30, 2011.

The licensing process mandated the preparation of a Water System Financial Plan in accordance with O. Reg. 453/07, and submission to the Ministry of the Environment within six (6) months of receiving the license. The City retained the services of DFA Infrastructure International Inc. to prepare a Financial Plan for its drinking water system. The Financial Plan required under O. Reg. 453/07 is for the six (6) year period from 2011 to 2016 inclusive. The City of Pembroke Water System Financial Plan was submitted to the Ministry of Municipal Affairs and Housing as required by regulation.

As the Owner of the municipal drinking water systems, Council has a number of duties and responsibilities under the *Safe Drinking Water Act*, which are described in sections 11, 13, 16 and 17 of the Act. The duties of the Owner related to the Standard of Care are under section 19.

This section of the *Act* (Standard of Care) is to come into force on December 31, 2013.

As the Owner, Council can be assured that the City of Pembroke is striving to meet the Standard of Care under the *Safe Drinking Water Act* by having a Municipal Drinking Water Licence in place for its drinking water system. The elements of the Licence include:

1. A permit to take water;
2. A drinking water works permit;
3. An operational plan;
4. A financial plan; and,
5. An accredited operating authority.

In summary, the Corporation of the City of Pembroke has met items 1 through 4 listed above.

The final requirement is for the Operating Authority to receive its Full Scope Accreditation, and in order to receive it, the Operating Authority must have a successful on-site external audit of its Operational Plan conducted by an accredited third party.

As indicated above the City of Pembroke, filed application for Full Scope – Entire Accreditation on September 29, 2011. Staff received notification in early December that the Canadian General Standards Board assigned auditor had commenced a desk top review of our DWQMS.



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On March 6th, 2012, the Ministry of the Environment contacted all owners and operating authorities to advise that **“the ministry will be transitioning accreditation bodies over the next few months”**.

March 7, 2012, owners and operating authorities were notified by CGSB, that because of the Ministry’s **“transitioning accreditation bodies”**, CGSB is not planning to conduct any further audits, but will ensure MOE is aware of the status of your file and CGSB will transfer all files to the MOE upon or before the termination of their program.

During the transition owners are expected to continue to meet your accreditation obligations, and required to notify CGSB of any changes to our quality management system.

On May 8, 2012, the City was notified that C.G.S.B. had completed their Document Review Audit of our Full Scope – Entire Accreditation resulting in the issuance of one (1) Minor Non-Conformance Corrective Action Request (CAR #1840).

The Corrective Action Request was completed by City staff on May 29, 2012, and forwarded to CGSB for review and assessment. On June 7, 2012, the City received notice that the C.A.R. had been reviewed, approved and closed.

On May 28, 2012, the City of Pembroke Signed the required Transfer of Accreditation Agreement as required before the Ministry of the Environment’s June 22, 2012 deadline, selecting QMI-SAI Global as our new Accreditation Body.

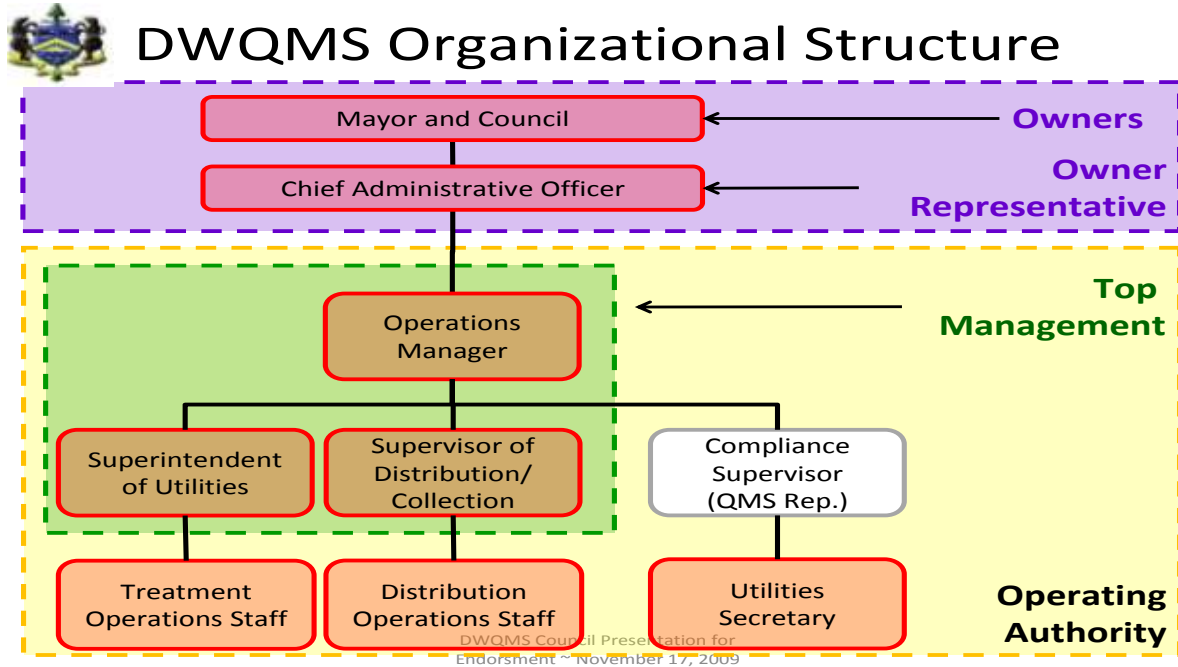
June 22, 2012, the City of Pembroke received confirmation that our Accreditation Program documentation had been transferred to the Ministry of Environment, who will assist the transition of our file to the new Accreditation Body QMI-SAI Global.

We are currently working with our new Accreditation Body to coordinate our On-Site Verification Audit.

4.0 Roles & Responsibilities

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

Chart 1: DWQMS Organizational Structure



DWQMS Roles & Responsibilities

| Participants | Roles & Responsibilities |
|---------------------|--|
| Owner | <ul style="list-style-type: none"> Maintain Municipal Drinking Water Licence Endorse DWQMS Operational Plan Endorse DWS Financial Plan Provide resources for operation and maintenance of the DWS Ensure that DWS is operated in compliance with legislation |
| Top Management | <ul style="list-style-type: none"> Develop and endorse DWQMS Policy & Operational Plan Allocate resources for operation and maintenance of the DWS Participate in DWQMS Infrastructure Review, Internal Audits, and Management Review Communicate with Owner, Staff, Suppliers & Consumers |
| QMS Representative | <ul style="list-style-type: none"> Ensure that the DWQMS is established, implemented and maintained Report to Top Management regarding QMS performance Promote awareness of legislation, regulations, and QMS throughout Operating Authority Administer document and record control processes |
| Operating Authority | <ul style="list-style-type: none"> Meet and maintain required competencies for role Perform work relating to the drinking water system as assigned Participate in DWQMS Internal Audits Maintain & continually improve DWQMS Work in compliance with legislation, regulations, and procedures |



5.0 Drinking-Water System Performance

5.1 Incidents of Regulatory Non-Compliance

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

i. Ministry of Environment (MOE): inspection reports: All waterworks were inspected during 2011-12 by the MOE. There were no items of regulatory non-compliance and 1 Best Practice recommendations made. For the 2011–12, inspection year, the water system received an inspection rating of 100 per cent. This represents the second consecutive year the City of Pembroke Drinking Water System received a rating of 100%.

ii. Operator Certification Records: The Pembroke Water Treatment and Distribution Systems were operated at all times by certified operators. Considerable management effort and documentation is required to provide training and maintain valid certificates for the 21 (twenty one) certified operators and staff are continuing to streamline and document the certification and renewal process.

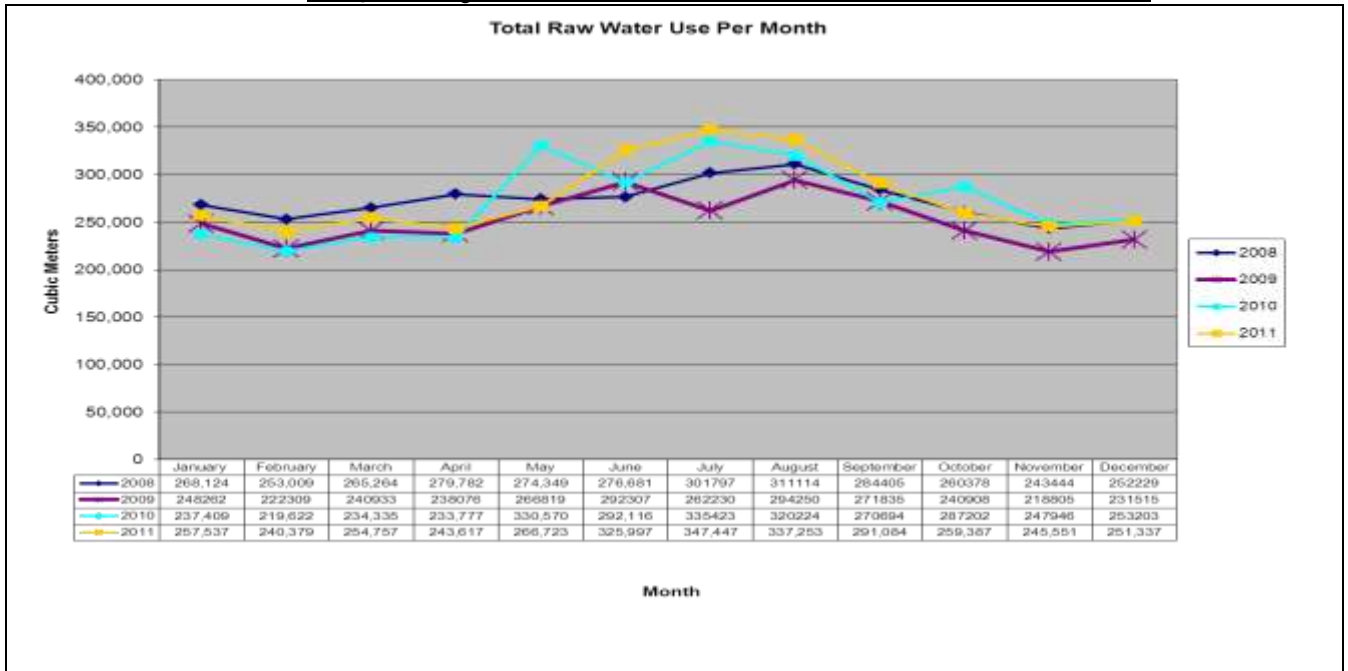
iii. Water Flow Rate Trends: There were no cases of daily “raw” water taking exceeding the permitted values stipulated in the Permit to Take Water.

Table 1: Raw Water Taking Pembroke Drinking Water System 2011

| Month | Total (m³) | Average (m³/day) | Max (m³/day) | Rated Capacity (m³/day) | % of Capacity | Max Instantaneous Peak Flow (L/s) | Rated Flows (L/s) | Exceedence |
|-----------|------------|------------------|--------------|-------------------------|---------------|-----------------------------------|-------------------|------------|
| January | 257,537 | 8,308 | 9,696 | 36,500 | 26.56 | 350.0 | 421 | no |
| February | 240,379 | 8,585 | 9,774 | 36,500 | 26.78 | 337.0 | 421 | no |
| March | 254,757 | 8,218 | 10,116 | 36,500 | 27.72 | 312.0 | 421 | no |
| April | 243,617 | 8,121 | 9,524 | 36,500 | 26.09 | 340.0 | 421 | no |
| May | 266,723 | 8,604 | 10,443 | 36,500 | 28.61 | 330.0 | 421 | no |
| June | 325,997 | 10,867 | 17,709 | 36,500 | 48.52 | 359.0 | 421 | no |
| July | 347,447 | 11,208 | 16,252 | 36,500 | 44.53 | 353.0 | 421 | no |
| August | 337,253 | 10,879 | 15,947 | 36,500 | 43.69 | 361.0 | 421 | no |
| September | 291,084 | 9,702 | 11,986 | 36,500 | 32.84 | 300.0 | 421 | no |
| October | 259,387 | 8,367 | 9,186 | 36,500 | 25.17 | 332.0 | 421 | no |
| November | 245,551 | 8,185 | 10,337 | 36,500 | 28.32 | 315.0 | 421 | no |
| December | 251,337 | 8,108 | 11,266 | 36,500 | 30.87 | 324.0 | 421 | no |
| Total | 3,321,069 | | | | | | | |
| Max | | | 17,709 | | | 361.0 | | |
| Average | | 9,096 | | | | 334.4 | | |



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iv. Water Quality Testing Records: The City of Pembroke water quality testing program has been intentionally designed to provide more than the required amount of sampling and testing to meet regulations. All Ontario requirements for microbiological, inorganic and organic testing were met.

v. Community Lead Testing Regulation:

The City of Pembroke filed application for Regulatory Relief from Lead Sampling Requirements on November 29, 2010. On January 20th, 2011 the City of Pembroke received Exemption from plumbing sampling under Schedule 15.1 of O. Reg. 170/03. As a condition of Exemption from collection of plumbing samples the City of Pembroke is still required to sample from our distribution system as follows:

- Sample for pH and Alkalinity every “winter” and “summer” period each year.
- Sample for lead once every three years, both “winter” and “summer” periods.

vi. MOE Orders: There were no MOE Orders in effect in 2011.

viii. Annual and Summary Reports: O.Reg.170/03 requires the Owner and the Operating Authority to prepare Annual Reports and Summary Reports for the waterworks. The Annual Reports for 2011 were completed within the required timeframe (by February 28, 2012) and are posted on the City of Pembroke’s website. Furthermore, the Summary Report for 2011 was completed by February 28, 2012 and endorsed by City Council February 21, 2012, as required by the regulation.

5.2 Incidents of Adverse Drinking Water Tests

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

The drinking water regulations identify several Indicators of Adverse Water Quality Incidents (AWQI) for which the waterworks must immediately notify health officials and the MOE, and carry out specific corrective actions. Adverse Drinking Water Quality Incidents for the calendar year 2011 are listed in **Table: 2**.



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During January to December 2011, there were a total of 2 AWQI. This compares to 7 in 2010. This improvement can be attributed primarily to operational changes and in part to the implementation of the DWQMS.

For each event, DWS staff immediately notified the Renfrew County & District Health Unit and the MOE as required by the regulation. In all cases, written reports were prepared and sent to the MOE and the Health Unit within 24 hours of the verbal notification, and corrective actions and re-sampling were carried out to resolve the incident. It should be noted that none of the adverse water quality events resulted in any indication of adverse health impacts or illness to the public.

Table 2: Adverse Water Quality Occurrences in the Pembroke Drinking Water System 2011

| Incident Date | AWQI # | Adverse Indicator | Maximum Allowable Parameter | Corrective Action | Corrective Action Date |
|---------------|---------------|-----------------------------------|-----------------------------|-------------------|------------------------|
| Oct. 18/11 | AWQI # 104068 | Total Trihalomethanes* 113.5 ug/L | 100 ug/L | Re-sampled | Nov. 01/11 |
| Aug. 15/11 | AWQI # 102732 | Sodium** 23.2 mg/L | 20 mg/L | Re-sampled | Aug. 17/11 |

****Trihalomethanes** are formed as a by-product predominantly when chlorine is used to disinfect water for drinking. They represent one group of chemicals generally referred to as disinfection by-products. They result from the reaction of chlorine and/or bromine with organic matter present in the water being treated.**

****Result of Plant Optimization Trials** Operational staff were experimenting with chemical dosages in an effort to maximize floc formation to increase settling results.**

5.3 Deviations from Critical Control Point Limits and Response Actions

Through the DWQMS risk assessment review process completed late 2011, five Critical Control Points (CCPs) within Water Production were reviewed and fourteen CCPs were identified for Water Distribution. Critical Control Limits (CCLs) are identified for each of these CCPs. The CCLs are self-imposed limits and are typically more stringent than MOE Drinking Water Standards or Municipal Drinking Water licence requirements. The identification of CCPs and associated CCLs results in a more rigorous screening of potential risks to water quality and is one benefit of the implementation of the DWQMS.

Deviations from CCLs do occur from time to time and do not necessarily mean that unsafe drinking water was delivered to the consumer. However, CCL deviations do require prompt action from water system operators to remediate the problem and prevent the passage of potentially unsafe water.

One deviation of a Critical Control Limit was identified in 2011, found under, DWQMS Risk Assessment Matrix OPS-UTL-DWS-GEN-FRM-004-001, Line Item #44 – Distribution (City) – Watermain – Commissioning of New Watermains.

The deviation of CCL occurred on November 11, 2011, during the commissioning of a watermain on Cecilia Street by a contractor. The commissioning of a watermain is identified as a Critical Control Point in the City of Pembroke Drinking Water System Risk Assessment and has identified Critical Control Limits attached.



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On this date, as directed by the Manager of Operations the contractor utilized the services of a Senior Water Purification Plant Operator to oversee the commissioning on a watermain project. While the personnel utilized in this circumstance is “deemed to hold” a Class 1 Water Distribution Certificate by the Ministry of the Environment, they did not possess adequate knowledge of City distribution operation, infrastructure or procedure to be providing oversight responsibilities on such a project.

5.4 Operational Performance

Table 3: Per Capita Water Consumption for the City of Pembroke 2011

Customer Services: Per capita residential water consumption declined slightly in 2011.

| <i>Per Capita Water Consumption for the City of Pembroke</i> | | | | | |
|--|-------------------|-------------------|----------------|--|--|
| <i>Treated Water Flows for 2010 & 2011</i> | | | | | |
| MONTH | 2010 <i>m3</i> | 2011 <i>m3</i> | | 2010 Monthly Per Capita Useage Litres | 2011 Monthly Per Capita Useage Litres |
| <i>Jan</i> | 229,565 | 229,056 | | 14,232 | 14,201 |
| <i>Feb</i> | 209,172 | 210,285 | | 12,968 | 13,037 |
| <i>Mar</i> | 223,030 | 227,990 | | 13,827 | 14,135 |
| <i>Apr</i> | 226,341 | 214,694 | | 14,032 | 13,310 |
| <i>May</i> | 307,984 | 235,503 | | 19,094 | 14,600 |
| <i>Jun</i> | 262,913 | 279,284 | | 16,300 | 17,315 |
| <i>Jul</i> | 300,094 | 294,408 | | 18,605 | 18,252 |
| <i>Aug</i> | 288,663 | 295,323 | | 17,896 | 18,309 |
| <i>Sep</i> | 244,114 | 253,975 | | 15,134 | 15,746 |
| <i>Oct</i> | 254,376 | 228,796 | | 15,770 | 14,185 |
| <i>Nov</i> | 218,750 | 213,650 | | 13,562 | 13,246 |
| <i>Dec</i> | 229,175 | 218,233 | | 14,208 | 13,530 |
| <i>Total</i> | 2,994,177 | 2,901,197 | <i>Average</i> | 15,469 | 14,989 |
| <i>Population</i> | 16,130 | 16,130 | <i>Minimum</i> | 12,968 | 13,037 |
| <i>Per Capita</i> | 186 | 180 | <i>Maximum</i> | 19,094 | 18,309 |

Calculations compiled above are based on data from Statistics Canada, as well as information obtained from the Ontario Ministry of the Environment - Drinking Water Website.

Population Data - There are a total of 16,130 persons served by the Pembroke Drinking Water System. This number includes 1,770 residents of Laurentian Valley, serviced by 629 connections to the Pembroke system.

Water Distribution Key Performance Indicators (KPI): The KPI’s for Water Distribution give an indication of the effectiveness and the efficiency of the corrective and preventative maintenance programs. During the 2011 calendar year there were a total of 11 Watermain Breaks in the Distribution System. Seven (7) watermain failures were a result of environmental conditions, (Frost/Ground movement). Three (3) resulted from failed infrastructure and One (1) was the result of another utility breaking the main while anchoring a pole. Distribution personnel were able to complete the required repairs while maintaining pressure in the system in all but 2 cases, therefore customers affected by a loss of service was minimal. The impact on customers averaged 7.5 hours per break.



5.5 Raw Water Supply and Drinking Water Quality Trends

As part of the Municipal Drinking Water License (MDWL), the City of Pembroke 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.

The Ottawa River provides a steady and abundant supply of source water for the treatment plants. Raw water quality monitoring for 2011 covered in excess of 400 test parameters utilizing in house testing and external laboratory testing. Our source water monitoring program exceeds the MOE requirements. In general, raw water trends were found to show typical levels of variation during 2011. There were no indications of raw water quality that would cause difficulties for the treatment process.

Table 4: Raw Water Supply Quality Trends City of Pembroke 2011

| Month | pH | Temp (C) | Hardness | Alkalinity | Colour | Turbidity | Alum. | Iron |
|--------|------|----------|----------|------------|--------|-----------|-------|-------|
| Jan-11 | 7.06 | 1.8 | 26 | 22 | 1 | 2.746 | 0.02 | 0.002 |
| Feb-11 | 7.00 | 1.6 | 25 | 21 | 0 | 4.010 | 0.02 | 0.005 |
| Mar-11 | 6.99 | 1.8 | 26 | 21 | 0 | 4.201 | 0.02 | 0.001 |
| Apr-11 | 6.91 | 4.6 | 22 | 18 | 0 | 3.228 | 0.02 | 0.001 |
| May-11 | 6.90 | 10.1 | 20 | 16 | 0 | 2.235 | 0.02 | 0.003 |
| Jun-11 | 6.89 | 16.0 | 18 | 16 | 0 | 2.501 | 0.03 | 0.001 |
| Jul-11 | 6.96 | 20.6 | 22 | 19 | 0 | 2.241 | 0.02 | 0.001 |
| Aug-11 | 7.15 | 22.8 | 23 | 22 | 1 | 1.456 | 0.01 | 0.012 |
| Sep-11 | 7.09 | 19.8 | 25 | 22 | 0 | 1.208 | 0.02 | 0.000 |
| Oct-11 | 7.07 | 15.1 | 27 | 23 | 0 | 1.348 | 0.01 | 0.000 |
| Nov-11 | 7.03 | 10.1 | 27 | 24 | 0 | 1.729 | 0.01 | 0.000 |
| Dec-11 | 7.04 | 5.1 | 25 | 22 | 0 | 2.292 | 0.02 | 0.001 |

pH – measurement of hydrogen ion activity; indication of acidity; effects efficiency of all chemical reactions in water treatment

Alkalinity – buffering capacity of water; the capacity of water to neutralize itself. Alkalinity stabilizes water at pH levels around 7.

Hardness - The hardness is determined by the number of calcium and magnesium atoms present

Turbidity - measure of non-transparency of water due to the presence of suspended matter

Chart 2: 2011 Raw Water Characteristics

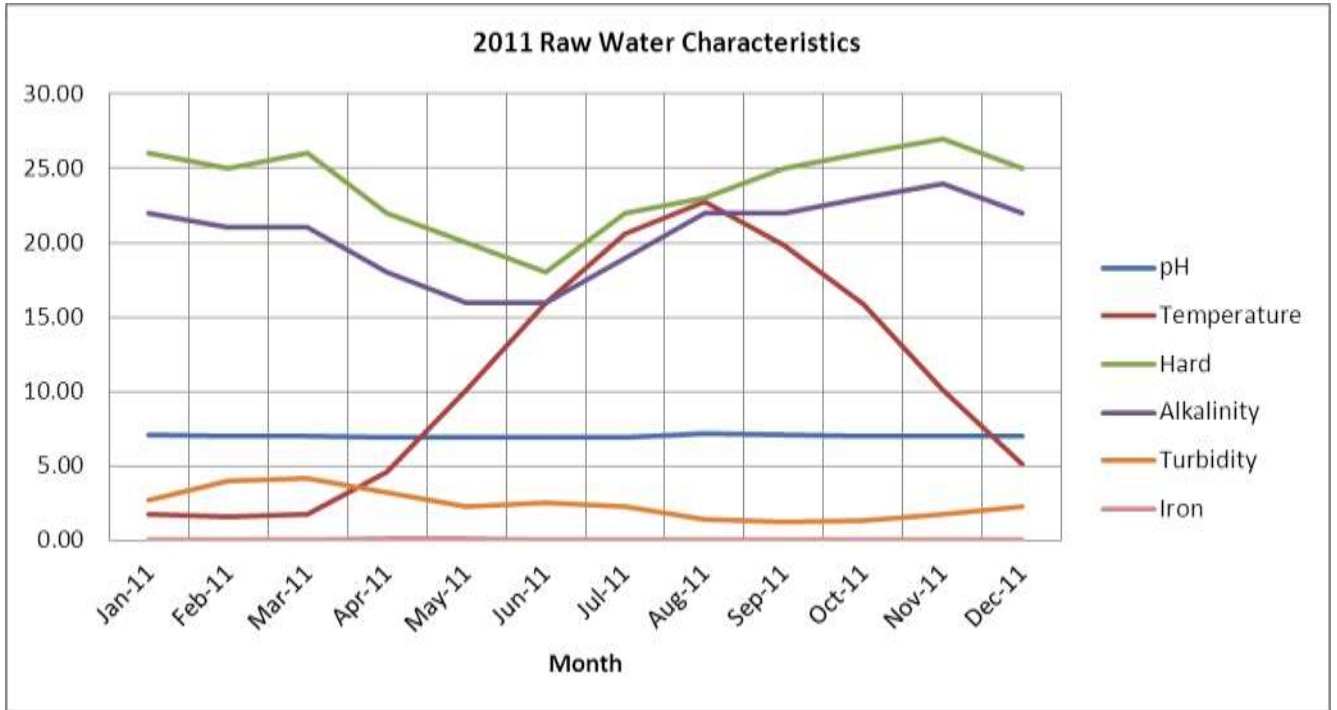
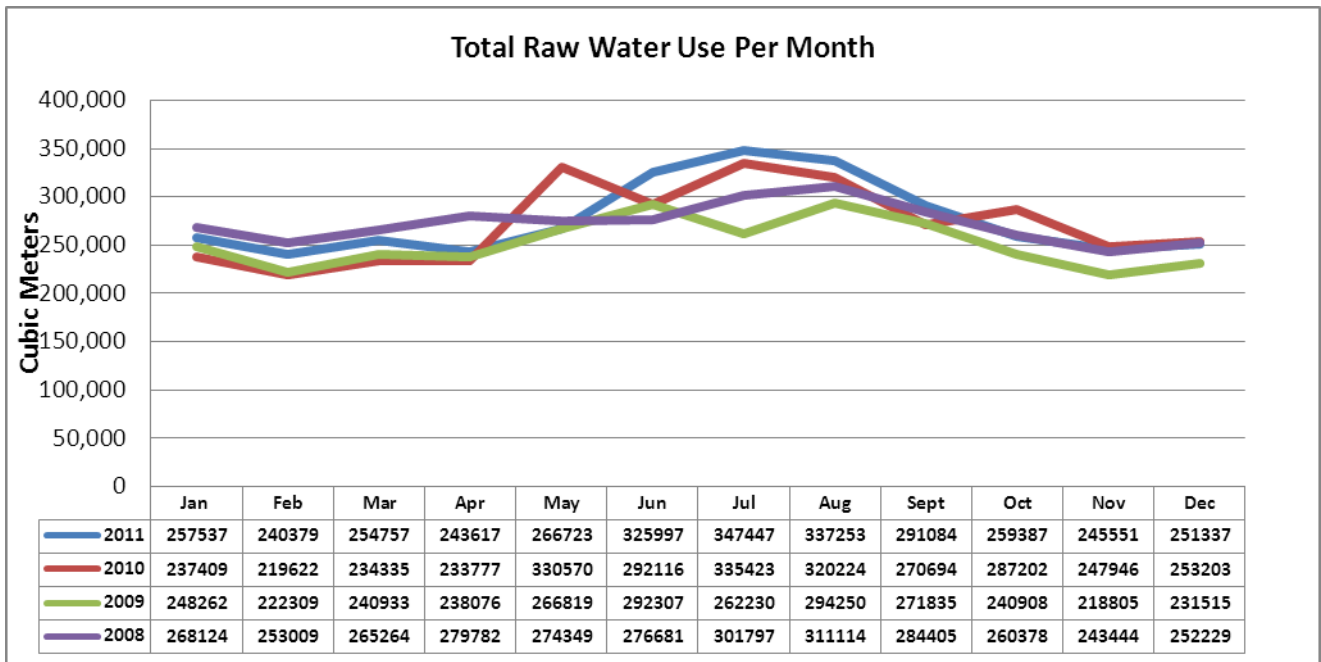


Chart 3: 2011 Raw Water Use Monthly Comparison





5.6 Treated Water Quality:

The 2011 performance measures for Water Quality indicate ongoing high quality drinking water. A 100 per cent rating for microbiological quality indicates that the treatment process effectively removed pathogens at all times. Similarly, a 100 per cent rating for chemical water quality indicates that all water quality tests were within the provincial and federal standards for safe drinking water.

Table 5: Summary of Distribution Bacteriological Sampling 2011

| | # of Samples | Average Cl₂ | **Min Cl₂ | Max Cl₂ |
|------------------|---------------------|-------------------------------|-----------------------------|---------------------------|
| January | 30 | 0.82 | 0.59 | 1.22 |
| February | 24 | 0.78 | 0.41 | 1.17 |
| March | 30 | 0.85 | 0.41 | 1.19 |
| April | 24 | 0.79 | 0.34 | 1.10 |
| May | 24 | 0.84 | 0.54 | 1.29 |
| June | 24 | 0.71 | 0.48 | 1.12 |
| July | 24 | 0.60 | 0.19 | 1.17 |
| August | 30 | 0.45 | 0.13 | 1.21 |
| September | 24 | 0.57 | 0.16 | 1.15 |
| October | 24 | 0.57 | 0.12 | 1.25 |
| November | 24 | 0.58 | 0.18 | 1.03 |
| December | 24 | 0.67 | 0.17 | 1.28 |

** Where the provision of secondary disinfection is required by the Regulation, the drinking-water system's distribution system must be operated such that at all times and at all locations within the distribution system, where there is a daily flow, there is at least a free chlorine residual of 0.05 mg/L at a pH 8.5 or lower.



Table 6: Treated Water Produced Pembroke Water Purification Plant 2011

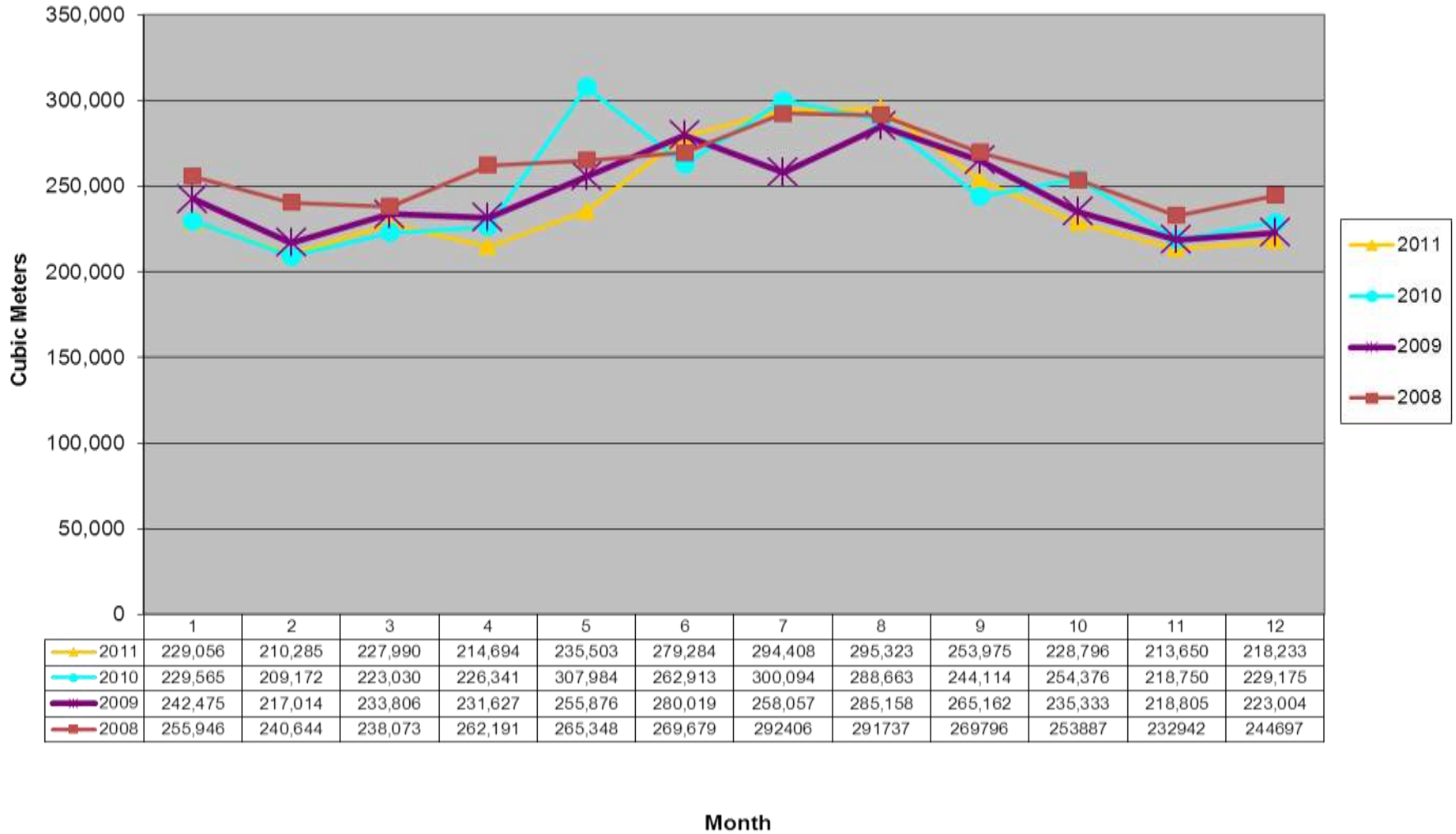
Treated Water for 2011

| Month | Total (m ³) | Average (m ³ /day) | Max (m ³ /day) | Rated Capacity (m ³ /day) | % of Capacity | Max Instantaneous Peak Flow (L/s) | Rated Flows (L/s) | Exceedence | Min. Monthly CL2 Residual | Max. Monthly CL2 residual |
|-----------|-------------------------|-------------------------------|---------------------------|--------------------------------------|---------------|-----------------------------------|-------------------|------------|---------------------------|---------------------------|
| January | 229,056 | 7,388 | 8,424 | 36,374 | 23.16 | 309.0 | 421 | no | 1.16 | 1.42 |
| February | 210,285 | 7,510 | 8,500 | 36,374 | 23.37 | 311.0 | 421 | no | 1.17 | 1.38 |
| March | 227,990 | 7,354 | 8,392 | 36,374 | 23.07 | 307.0 | 421 | no | 1.12 | 1.88 |
| April | 214,694 | 7,156 | 8,044 | 36,374 | 22.11 | 323.0 | 421 | no | 1.16 | 1.44 |
| May | 235,503 | 7,596 | 8,947 | 36,374 | 24.60 | 360.0 | 421 | no | 1.14 | 1.36 |
| June | 279,284 | 9,309 | 14,976 | 36,374 | 41.17 | 305.0 | 421 | no | 1.14 | 1.38 |
| July | 294,408 | 9,497 | 12,588 | 36,374 | 34.61 | 292.0 | 421 | no | 1.16 | 1.41 |
| August | 295,323 | 9,527 | 13,956 | 36,374 | 38.37 | 315.0 | 421 | no | 1.16 | 1.54 |
| September | 253,975 | 8,466 | 10,032 | 36,374 | 27.58 | 298.0 | 421 | no | 1.19 | 1.57 |
| October | 228,796 | 7,381 | 8,980 | 36,374 | 24.69 | 298.0 | 421 | no | 1.20 | 1.51 |
| November | 213,650 | 7,122 | 7,874 | 36,374 | 21.65 | 412.0 | 421 | no | 1.15 | 1.50 |
| December | 218,233 | 7,040 | 8,648 | 36,374 | 23.78 | 385.0 | 421 | no | | |
| Total | 2,901,197 | | | | | | | | | |
| Min | | | | | | | | | 1.12 | |
| Max | | | 14,976 | | 41.17 | 412.0 | | | | 1.88 |
| Average | | 7,948 | | | | | | | | |

Average Daily Flow = 7,948 m³/day



Treated Water Monthly Totals



5.7 Summary of Consumer Feedback

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 customers regarding water quality.

The number of water quality investigations for 2011 was 11 and has remained fairly consistent over the last four years (2010-11 investigations), (2009-14 investigations), (2008-14-investigations).

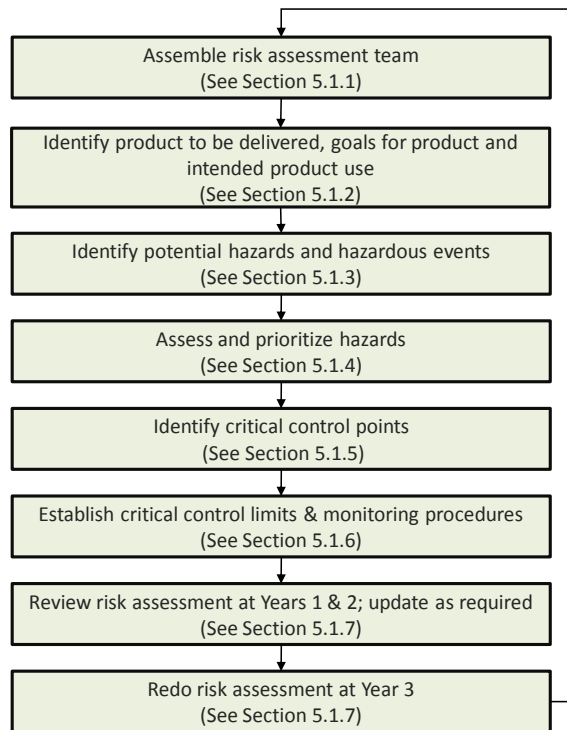
The average time taken to resolve customer complaints has been relatively steady for general water quality investigations. In 2011 the time spent resolving customer complaints averaged 1 hour and 27 minutes. This represents the time between the initial telephone call received and the final reporting of results to the customer. The Operations Department receives water quality questions, interview customers and initiates “service requests”. If a customer service visit is required, results are communicated to the customer after the investigation has been completed.

6.0 Management System Performance

6.1 The Risk Assessment Process

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 measures must be identified and critical control points must be realized. 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 system must occur every 36 months.

Chart 5: Risk Assessment Process Risk Assessment Process – Overview





The risk assessment matrix contains all drinking-water components and their associated risks. The matrix is maintained by the Compliance Supervisor.

The risk assessment outcomes from 2011 were critically reviewed during the 2012 risk assessment review in order to make the CCPs/CCLs more effective as an operational tool and capture additional risks deemed important for safe drinking water. No changes to CCPs were identified for Water Production or Water Distribution.

6.2 Results of Audits (Internal and External)

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. The City of Pembroke's Operational Plan specifies that the Drinking Water System is audited internally once every 12 months. An external audit is conducted by an Accreditation body in response to an Operating Authority's application for accreditation.

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.

Internal Audit: Internal audits were conducted in January, March and September of 2011. The internal audit reports noted progress in implementing the DWQMS. Major non-conformances in 2011 related to: the vacant position of Superintendent and how the associated duties of this position were being fulfilled, By-law enforcement, and Roles & Responsibilities of the Operating Staff, including general awareness of the DWQMS. The Internal Audit Reports were completed and for items identified, Preventative & Corrective Action Requests (PCARs) were reviewed by Upper Management. These non-conformances require a sustained, long-term effort in order to fully implement. Minor non-conformances were mainly administrative in nature and are being addressed with continual improvement efforts.

External Audit: The Limited Scope – Entire Accreditation Certificate was issued subject to the condition that the City of Pembroke submits an application for Full Scope – Entire DWQMS Accreditation. Full Scope Accreditation is based on a system audit and on-site verification audit of the DWQMS Elements by an accredited third party..

The City of Pembroke filed application for Full Scope – Entire Accreditation on September 29, 2011.

As indicated previous the City of Pembroke, filed application for Full Scope – Entire Accreditation on September 29, 2011. Staff received notification in early December 2011, that the CGSB assigned auditor had commenced a desk top review of our DWQMS.

On March 6th, 2012, the Ministry of the Environment contacted all owners and operating authorities to advise that the ministry will be **“transitioning accreditation bodies over the next few months”**.

March 7, 2012, owners and operating authorities were notified by CGSB, that because of the Ministry's **“transitioning accreditation bodies”**, CGSB was not planning to conduct any further audits, but will ensure MOE is aware of the status of your file and CGSB will transfer all files to the MOE upon or before the termination of their program.

During the transition owners are expected to continue to meet your accreditation obligations, and required to notify CGSB of any changes to our quality management system.

On May 8, 2012, the City was notified that C.G.S.B. had completed their Document Review Audit of our Full Scope – Entire Accreditation resulting in the issuance of one (1) Minor Non-Conformance Corrective Action Request (CAR #1840).



The Corrective Action Request was completed by City Staff on May 29, 2012, and forwarded to CGSB for review and assessment. On June 7, 2012, the City received notice that the CAR had been reviewed, approved and closed.

On May 28, 2012, the City of Pembroke Signed the required Transfer of Accreditation Agreement as required before the Ministry of the Environment's June 22, 2012 deadline, selecting QMI-SAI Global as our new Accreditation Body.

June 22, 2012, the City of Pembroke received confirmation that our Accreditation Program documentation had been transferred to the Ministry of Environment, who will assist the transition of our file to the new Accreditation Body QMI-SAI Global.

We are currently working with our new Accreditation Body to coordinate our On-Site Verification Audit.

6.3 Results of Relevant Emergency Response Testing

Element 18 of the DWQMS is Emergency Management. An emergency is considered a potential situation that may result in the loss of the ability to maintain a service to customers. The DWQMS requires the Operating Authority to maintain a state of emergency preparedness. There are approximately 19 procedures that have been developed to effectively handle emergency situations in our drinking water system.

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

- mock emergency testing of procedures related to a specific event, that audits a specific procedure.
- requirement for Operational Staff to review all emergency procedures annually and "sign off".

6.3.1 Emergency Test – Chlorine Emergencies

On November 30, 2011 a round table walk through emergency exercise was conducted involving Water Treatment Plant Operational Staff and Management. The exercise tested the Water Treatment Plant's response to Chlorine Emergencies (*OPS-UTL-DWS-GEN-SOP-014-005*). The exercise was successful as it demonstrated overall staff competency and ability to respond to an incident. As a result of the exercise the corresponding Response Plan was reviewed and procedural improvements were made in a number of areas identified.

Appendix A – Copy of Emergency Exercise Review Minutes.

6.4 Follow up items from Previous Management Review

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.

2011 marks the City of Pembroke's second Management Review.

During the calendar year 2011, twenty five (25) Preventative and Corrective Action Requests (PCARs) were issued as a result of Internal Audits. Twenty one (21) PCARs were addressed and closed.

6.5 Status of Management Action Items identified between Reviews

As identified during the 2011 Management Review, some items must be addressed over the long term, but it is expected that the majority of items will be completed by the time of the next management review in the fourth quarter of 2012. Action items will be prioritized and tracked to completion.



6.6 Changes that could affect the QMS

Changes that could affect the QMS' allows for discussion of changes that have occurred within the organization or management system that cover the review period.

During the period covered by this Management Review, there have been no significant changes within the organization or management system. As reported in last year's report the City's Operations Department has undertaken a Strategic Alignment Initiative. Contrary to initial projections, the restructuring did not significantly affect QMS documentation, or changes involving responsibility centres referenced in the DWQMS Operational Plan. Other specific elements within the QMS were reviewed to ensure that any changes were correctly reflected. Changes outside the Department are not anticipated; however, staff will ensure that these changes are reflected in the QMS accordingly as they become evident.

6.7 Resources Needed to Maintain the QMS

Resources are broadly defined as those things needed to implement and maintain the management system – 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.

These resources support the implementation of the continual improvement process under the DWQMS and involve the dedication of staff to support the Drinking Water System.

Additional resource needs relate to ongoing implementation of operational improvements and staff “buy in”.

During the 2011 period covered by this report the Operations Department lost a number of trained internal auditors due to attrition. Arrangements will be made to provide for the training of additional auditors and at the same time provide refresher training to our current pool of auditors.

Efforts continue to address the needs and priorities within the Drinking Water System by having Supervisors dedicate time and resources for development of required procedures and documents.

6.8 Results of the Infrastructure Review

The annual review of the provision of drinking water infrastructure has two objectives: (i) to identify new drinking water infrastructure needs related to growth and system optimization and (ii) to identify upgrades or renewals of existing infrastructure to optimize operations and maintenance.

In February 2011, a Multi Year Capital Construction Plan (MYCCP) was approved in principle by Council. This MYCCP identified the intentions of the City for infrastructure renewal for the next several years. This is the first time that the City has undertaken this exercise and the MYCCP will evolve over time.

The Operations Department was required to develop a “Financial Plan” (under Ont. Regulation 453) as it relates to the water system. This “Financial Plan” was required to be completed no later than 6 months after the date of the issuance of the updated Drinking Waterworks Permit and Drinking Water License.

The City retained the services of DFA Infrastructure International Inc. to prepare a Financial Plan for its drinking water system. The Financial Plan required under O. Reg. 453/07 is for the six (6) year period from 2011 to 2016 inclusive. The City of Pembroke Water System Financial Plan was submitted to the Ministry of Municipal Affairs and Housing as required by regulation.

Over the last several years, data has been collected relating to such items as watermain repairs, inoperable valves, etc.. The challenge remains to integrate this data into the MYCCP and either advance or defer major capital expenditures to address inferred infrastructure deficiencies.



The Operations Department began populating an infrastructure management database (Municipal Data Works – MDW) in 2011. This database will also be used to update the MYCCP and confirm priorities. The Operations Department continues to make extensive use of our Geographical Information System (G.I.S.)

The Operations Department is aware of capital needs for water related infrastructure renewal. These capital needs must be balanced with the rate payers “ability to pay” and integrated with other priority infrastructure renewal initiatives (Roads for example).

6.9 Operational Plan Currency, Content and Updates

The DWQMS requires Operating Authorities to document QMS for our 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. The Operational Plan is the document that describes how the City of Pembroke plans to meet the requirements of the DWQMS. It is then the responsibility of the Operating Authority to implement the plan.

The DWQMS Operational Plan has not gone through any significant revisions during the 2011 calendar year. Revisions and updates made to System Level Procedures & Supporting Documentation have been completed as per schedule or as required in a timely manner and updated controlled hard copies were distributed.

7.0 Summary of Staff Suggestions

Any staff suggestions regarding DWQMS are presented initially to Supervisors; once validated a *Change Request Form* OPS-UTL-DWS-GEN-FRM-002-003 is then filled out to accommodate the necessary change. Staff suggestions continue to be addressed through the DWQMS continual improvement process.

8.0 Next Management Review Meeting

Scheduled for the fourth quarter of 2012.



Appendix A

| Test of Emergency Response Plan – Debriefing Notes | |
|---|---|
| Date of Training: | <i>November 30, 2011</i> |
| Training of Document(s) #: | <i>OPS-UTL-DWS-GEN-SOP-014-005 – Chlorine Emergencies</i> |
| Participants: | <i>Douglas Sitland, Manager of Operations; Douglas Burton, Compliance Supervisor; Blaine McEwen, Supervisor of Utilities; Tim Thom, Chief Operator; Operator; Tim Ward, Operator; Michel Dubois, Operator; Brenda Lowe, Utilities Secretary</i> |
| Absent: | |

In accordance with the DWQMS, the City of Pembroke is required to test the performance of the Emergency Response Plan as it specifically relates to the Utilities Section and as documented in the DWQMS.

For the purposes of this exercise, a round table walk through of the procedure for chlorine emergencies was undertaken. The test of the procedure will involve theoretical response at the water purification plant.

EXPECTED RESPONSE

The procedure for response under these circumstances is very detailed, including step by step instructions and the communications protocol. The exact sequence of events and communications protocol will be evaluated.

For the purposes of the exercise, only Operations Department staff will participate. There shall be no involvement of other City staff.

GENERAL OBSERVATIONS

- *PPE to include:*
 - *Escape mask (up to 1 ppm)*
 - *SCBA*
 - *Encapsulated suit – NA (as per Blaine McEwen, the operators will not be exposed to these limits)*
 - *During routine changeovers – long sleeve shirt and eye protection (goggles or face shield)*
- *SCBA – extra bottle on hand as a back-up*
- *Chlorine Tonner Changeover is a **3-person procedure**; 2 operators perform changeover with proper PPE with a third standby operator with SCBA outside tonner room.*
- *2 plant operators required for the unloading of the chlorine tonners;*
 - *check for leaks with ammonia before unloading the tonner*



- 3 scenarios of Procedures to be developed
 - Alarm during the day;
 - Alarm during a tonner changeover; and
 - Alarm after hours
- Responsibilities sections of procedure require revision.
- Doug Sitland to check with awareness of chlorine emergencies with the City of Pembroke Corporate Emergency Response Plan – may need add Chlorine Emergencies to corporate plan
- Alarm on SCADA needs to be adjusted so chlorine alarm doesn't go off every time there is a power outage ****identification of chlorine concentration on SCADA**** for afterhours emergencies
- Review of responsibilities matrix on page 37
- For after hour emergencies; set up system to identify that it is an actual chlorine leak so that there are always 2 operators***

IMPROVEMENTS

- Fit Test for escape mask and SCBA; co-ordinate with the Fire Chief with new Firefighter Annual SCBA training through the Fire Department
- Maintenance/Electrical operator to change alarm set-point on QEL from 2 p.p.m. to 1 p.p.m.
- Maintenance/Electrical operator QEL hook-ups; meter needs to be set after power bump at monitor
- Trending?

DEBRIEFING

*In summary a round table discussion/review of a Chlorine Emergency at the Water Purification Plant was conducted with the intent to test procedure: **OPS-UTL-DWS-GEN-SOP-014-005 – Chlorine Emergencies***

*Identification of short comings was noted and the Supervisor of Utilities is to assign the revision of the procedure **OPS-UTL-DWS-GEN-SOP-014-005 – Chlorine Emergencies**, as well as any other procedures that deal with power outages.*

The Operations department will continue with “hands-on” emergency response training for water operations and this training will expand to include the distribution operators. As requested, the need for a write-up for operators not directly involved in the procedure will be produced.