

**Ministry of the Environment**

Safe Drinking Water  
Branch

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**Ministère de l'Environnement**

Direction du contrôle de la qualité de l'eau  
potable

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January 26, 2009

The Town of Markham  
Waterworks Department  
101 Town Centre Boulevard  
Markham, Ontario L3R 9W3

Attention: Jerry Klaus, General Manager

**RE: Markham Distribution System (220004162)**

**File: SI YO MA TO 540**

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Please find attached the Ministry of the Environment's inspection report for the above facility. The report details the findings of the inspection that took place December 3, 2008. Please forward the action plan and/or response to the undersigned at York Durham District Office of the Ministry of the Environment by February 28, 2008.

Please note that "*Actions Required*" are linked to incidents of non-compliance with regulatory requirements contained within the Act, a regulation, or site-specific approvals, licenses, permits, orders or instructions. Such violations could result in the issuance of mandatory abatement instruments including Orders, tickets, penalties, or referrals to the ministry's Investigations and Enforcement Branch.

"*Recommended Actions*" convey information that the owner or operating authority should consider implementing in order to advance efforts already in place to address such issues as emergency preparedness, the availability of information to consumers, and conformance with existing and emerging industrial standards. Please note that items which appear as recommended actions do not, in themselves, constitute violations.

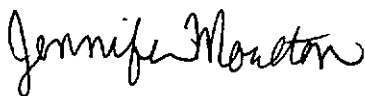
Please note, you will find in the report that bullets are shown in bold print and are the consistent and standard responses to the information gathered during the inspection. Statements shown in regular font provide additional site-specific details.

In order to measure individual inspection results, the Ministry has established an inspection compliance risk framework based on the principles of the Inspection, Investigation & Enforcement (II&E) Secretariat and advice of internal/external risk experts. The Inspection Summary Rating Record (IRR), included as Appendix D of the

inspection report, provides the Ministry, the system owner and the local Public Health Units with a summarized quantitative measure of the drinking water system's annual inspection and regulated water quality testing performance. Please note the attached IRR methodology memo describing how the risk rating model has improved to better reflect the health related and administrative non-compliance found in an inspection report. IRR ratings are published (for the previous inspection year) in the Ministry's Chief Drinking Water Inspectors' Annual Report.

I would like to thank Markham's Town Staff, especially Robert Flindall, Noris Dela Cruz, Karen Dennison and Helena Dutaud, for the assistance afforded to me during the conduct of the compliance assessment. If you have any questions or concerns please contact myself or Oral Binda, Drinking Water Program Supervisor, Central Region at 905-427-5630.

Yours truly,



Jennifer Moulton  
Central Region Drinking Water Inspector  
Safe Drinking Water Branch  
Ministry of Environment  
Phone: (905) 427-5618

cc:

Joann Simmons, Commissioner of Health  
Dr. Karim Kurji, Medical Officer of Health  
Bernard Mayer, Manager of Health Protection, York Region Health Unit  
Don Ford, Manager Geo-Environmental, Toronto Regional Conservation Authority  
John Livey, Chief Administrative Officer, Town of Markham  
Oral Binda, York Durham District Office, MOE



# Ontario

Ministry of the Environment

## MARKHAM DISTRIBUTION SYSTEM Drinking Water System Inspection Report

<b>DWS Number:</b>	220004162
<b>Inspection Number:</b>	1-6R8VK
<b>Date of Inspection:</b>	Dec 03, 2008
<b>Inspected By:</b>	Jennifer Moulton

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**Ministry of the Environment**

**MARKHAM DISTRIBUTION SYSTEM  
Drinking Water System Inspection Report**

<b>DWS Number:</b>	220004162
<b>Inspection Number:</b>	1-6R8VK
<b>Date of Inspection:</b>	Dec 03, 2008
<b>Inspected By:</b>	Jennifer Moulton

**OWNER INFORMATION:**

<b>Company Name:</b>	MARKHAM, THE TOWN OF		
<b>Street Number:</b>	101	<b>Unit Identifier:</b>	
<b>Street Name:</b>	TOWN CENTRE Blvd N		
<b>City:</b>	MARKHAM		
<b>Province:</b>	ON	<b>Postal Code:</b>	L3R 9W3

**CONTACT INFORMATION**

<b>Type:</b>	Operating Authority	<b>Name:</b>	Jerry Klaus
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<b>Title:</b>	General Manager of Waterworks Department		

<b>Type:</b>	Operator	<b>Name:</b>	Robert Flindall
<b>Phone:</b>	(905) 477-7000 x2445	<b>Fax:</b>	(905) 475-4732
<b>Email:</b>	rflindall@markham.ca		
<b>Title:</b>	Manager, Operations & Maintenance, Waterworks Department		

<b>Type:</b>	Contact	<b>Name:</b>	Noris M. Dela Cruz
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<b>Type:</b>	Coordinator	<b>Name:</b>	Helena Dutaud
<b>Phone:</b>	(905) 477-7000 x2449	<b>Fax:</b>	(905) 479-7772
<b>Email:</b>	hdutaud@markham.ca		
<b>Title:</b>	Water Quality Coordinator		

<b>Type:</b>	Coordinator	<b>Name:</b>	Anna Distefano
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<b>Email:</b>	adistefano@markham.ca		
<b>Title:</b>	Training Coordinator		

**INSPECTION DETAILS:**

**DWS Name:** MARKHAM DISTRIBUTION SYSTEM  
**DWS Address:** 101 TOWN CENTRE BLVD N  
**County/District:** Markham  
**District/Area Office:** Moe York-Durham District  
**DWS Category:** Large Municipal Residential  
**DWS Number:** 220004162  
**Inspection Type:** Unannounced  
**Inspection Number:** 1-6R8VK  
**Date of Inspection:** Dec 03, 2008  
**Date of Previous Inspection:** Feb 26, 2008

**DRINKING WATER SYSTEM COMPONENTS DESCRIPTION**

**Site (Name):** Markham Operation Office

**Type:** Other

**Sub Type:** Other

**Comments:**

The Markham Distribution System is operated and maintained by the Town of Markham, and receives most of its distribution water from the City of Toronto. The York Water System was inter-connected with Peel Region in 2006, but the Town of Markham does not receive any water from the Peel System under normal operating conditions. The trunk transmission lines and the water storage facilities located within the Markham Distribution System are owned and operated by the Regional Municipality of York.

The City of Toronto operates and maintains four surface water treatment plants utilizing chemically assisted filtration, chlorination, fluoridation and chloramination processes. The Regional Municipality of York measures and monitors the distribution water flows and volumes directed to the Town of Markham through the use of ten (10) flow meters located along the Richmond Hill, Vaughan, Toronto and Markham boundaries.

The Markham Distribution System (DS) provides potable water to approximately 293,700 residents of Markham. The Markham Distribution System comprises approximately 955 km of watermains, 7,524 hydrants, 7,510 valve chambers, 9,281 valves, 172 blow-offs, and approximately 69,485 service connections.

**Site (Name):** Distribution System Sampling Station

**Type:** Other

**Sub Type:** Other

**Comments:**

The sampling station located on Lemsford Drive (L08) in the town of Markham, is a regular sampling location for the Markham Distribution System.

**Site (Name):** Distribution System Sampling Station

**Type:** Other

**Sub Type:** Other

**Comments:**

The sampling station located on Calvert Road (A03) in the town of Markham, is a regular sampling location for the Markham Distribution System.

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**Site (Name):** Distribution System Sampling Station

**Type:** Other

**Sub Type:** Other

**Comments:**

The sampling station located on Fincham Ave. (J05) in the town of Markham, is a regular sampling location for the Markham Distribution System.

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**Site (Name):** Distribution System Sampling Station

**Type:** Other

**Sub Type:** Other

**Comments:**

The sampling station located on Hillmount Road (B05) in the town of Markham, is a regular sampling location for the Markham Distribution System.

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## INSPECTION SUMMARY

### INTRODUCTION

- \* The primary focus of this inspection is to confirm compliance with Ministry of the Environment legislation and authorizing documents such as Orders and Certificates of Approval, as well as evaluating conformance with Ministry drinking water related policies and guidelines during the inspection period.

The Ministry is implementing a rigorous and comprehensive approach in the inspection of drinking water systems that focuses on the source, treatment and distribution components of the system as well as management practices.

This report is based on an inspection of a "stand alone connected distribution system". This type of system receives treated water from a separately owned "donor" system. This report contains all of the elements required to assess key compliance and conformance issues associated with a "receiver" system to ensure that the system was not being operated or managed in a "deficient" condition, as defined under O. Reg. 172/03. The report does not contain items associated with the inspection of the donor system, such as source waters, intakes/wells and treatment facilities.

Commencing on December 3, 2008, Provincial Officer, Jennifer Moulton conducted an unannounced on-site inspection of the Markham Distribution System. Documents pertaining to the system were reviewed both on-site and off-site following the physical inspection. Ministry audit samples were collected on December 9, 2008.

Information and assistance with the inspection was provided by The Town of Markham staff. The data reviewed for the inspection period covered by this report was February 26, 2008 through to December 3, 2008.

### CAPACITY ASSESSMENT

- \* The owner was monitoring demand and population trends in order to monitor the need to upgrade or expand the system.

### TREATMENT PROCESSES

- \* The owner had ensured that all equipment was installed in accordance with the Permit, Licence or Approval issued under Part V of the SDWA.

The Corporation of the Town of Markham has Certificate of Approval (CofA) #0955-6S9L9A issued on August 4, 2006. The CofA pertains to the distribution system, not treatment of drinking water. The drinking water obtained from the Markham Distribution System is treated by the City of Toronto or the Region of Peel.

- \* The owner complied with the requirement to seek changes to the Permit, Licence or Approval issued under Part V of the SDWA where required, when changes were made.

- \* Up-to-date plans for the drinking-water system were available in accordance with the Permit, Licence or Approval issued under Part V of the SDWA.

Up-to-date plans are available for the distribution system.

- \* The facility and equipment appeared to be maintained and in a fit state of repair.

The equipment stored at 555 Miller Road, Markham, appeared to be maintained and in a fit state of repair.

**DISTRIBUTION SYSTEM**

- \* **The owner had up-to-date plans for the distribution system.**

Up-to-date plans were provided to the ministry in electronic format on a compact disc. Also, recent plans were provided in hard copy at 8100 Warden Avenue, Markham, during the inspection.

- \* **There was a cross-connection control/backflow prevention program, policy and/or by-law in place.**

Markham's by-law 2007-142 is in place to regulate cross connections and backflow prevention in private plumbing systems to protect the drinking water supply. The bylaw requires every owner of an applicable property to conduct a survey of their plumbing to identify any potential cross-connections, and to identify the sufficiency of existing or required backflow prevention devices.

The applicable property owner is required to retain a certified tester to carry out cross-connection surveys every three years, and to test backflow prevention devices annually. The by-law requires the surveys and testing to be reported to the Town of Markham. The completion of the first cross-connection survey and testing of backflow preventers are being phased-in according to the degree of hazard.

The Town of Markham has approximately 2000 Industrial, Commercial, and Institutional (ICI) properties. A preliminary risk/hazard assessment has been completed for half of the known ICI properties using the Canadian Standards Association (CSA) Standard CAN/CSA – B64 10.01 'Manual for the Selection and Installation of Backflow Prevention Devices,' and the City of Toronto's Risk Assessment Guide. For the remaining ICI properties a cross-connection survey should be conducted by the property owner in 2010 and a risk/hazard level will be assessed.

- \* **Backflow preventers were installed at each service connection to Industrial/Commercial/Institutional and agricultural process that were considered high hazard facilities.**

The Town of Markham is currently implementing Phase 1 of the Back Flow Prevention Program. Property plumbing surveys are required and from these backflow prevention device assembly required at each location will be determined.

- \* **There were no known cross connections between the distribution system and other water sources.**

At the time of the inspection the Town of Markham was not aware of any cross connections. Cross connection surveys are being carried out to identify any cross connections in accordance with Markham's by-law 2007-142.

- \* **Existing parts of the distribution system that were taken out of service for inspection, repair or other activities that may lead to contamination, and all new parts of the distribution system that came in contact with drinking water, were disinfected in accordance with the Procedure for Disinfection of Drinking Water In Ontario.**

Procedures for water main disinfection during repair, modification and installation, and repairs to potentially contaminated water mains were contained within the 'Waterworks Procedures Manual'.

- \* **There was a program for rehabilitation or replacement of watermains.**

A four year plan existed for the routine replacement of water mains.

- \* **The owner followed industry recognized standards or procedures in the material selection and design associated with distribution system construction and maintenance.**

- \* **The owner had implemented a program for the flushing of watermains as per industry standards.**

The Town of Markham conducts regular flushing of mains with priority sites flushed more often than others.

## **DISTRIBUTION SYSTEM**

- \* **A program was in place for inspecting and exercising valves.**

The program involves inspecting and exercising valves, where all main valves are exercised at least once every five years. Air valves are inspected and tested annually.

- \* **There was a program in place for inspecting and operating hydrants.**

Hydrants are inspected and operated annually mainly during the spring and summer months. Additional inspections are conducted in the winter months to check if the hydrants need draining.

- \* **There was a by-law or policy in place limiting access to hydrants.**

The Town of Markham's by-law #1602 outlines the access limits to hydrants.

- \* **Consumer water usage, including industrial and commercial water users, was fully metered.**

- \* **The owner had conducted an assessment of production volumes versus authorized consumption to determine the percentage of water loss in the distribution system.**

It was calculated that approximately 11% of the total amount of water distributed by the system was unaccounted for in 2007. From January 1, 2008 to October 31, 2008 it was calculated that approximately 9.54% of the total amount of water distributed by the system was unaccounted for.

- \* **The owner had undertaken efforts to identify, quantify and reduce sources of apparent water loss and/or established a leak detection/minimization program.**

A proactive leak detection program is in the development stages for the Town of Markham to identify, quantify, and repair unreported leaks. District Management Areas (DMA) are being created and instrumented to enable monitoring for system anomalies and trending. This will allow Markham to monitor and adjust pressure, as well as better account for water usages and losses. In addition, Markham actively pursues water main rehabilitation and replacement programs, and installation of cathodes to reduce degradation of existing water mains to reduce leakage.

Refer to Summary of Best Practice Issues and Recommendations.

- \* **The distribution system pressure was monitored to alert the operator of conditions which may have lead to loss of pressure below the value under which the system is designed to operate.**

Static water levels are measured at fire hydrants across the Town of Markham during hydrant inspections. Also, pressure is monitored if a water pressure complaint is received.

- \* **Based on the records available the owner was able to maintain proper pressures in the distribution system.**

The average day pressure in Markham is 74 psi. The average day pressure ranges between 42 to 108 psi.

- \* **The donor had provided an Annual Report to the receiver drinking water system.**

## **OPERATIONS MANUALS**

- \* **Operators and maintenance personnel had ready access to operations and maintenance manuals.**

Each operator has a binder with operation and maintenance procedures.

## **OPERATIONS MANUALS**

- \* **The operations and maintenance manuals contained plans, drawings and process descriptions sufficient for the safe and efficient operation of the system.**
- \* **The operations and maintenance manual contained a sampling plan.**

Regulatory sampling was scheduled annually or as required using an electronic database. The locations of all sampling stations are identified on a map.

- \* **The operations and maintenance manuals contained instructions pertaining to the identification of adverse drinking water conditions, as well as prescribed notification and corrective actions.**

Markham's 'Adverse of Exceedance of a Water Quality Test Response Standard Operating Procedure (SOP)' was available for review by the ministry.

- \* **The operation and maintenance manuals and the emergency/contingency plans were reviewed on a periodic basis.**

Along with the emergency/contingency plans, an emergency fan callout document has been created to provide emergency contact information for staff to use in case of an emergency. The contact information is updated immediately and is checked quarterly to ensure the document is up to date and accurate.

## **LOGBOOKS**

- \* **Logs for the distribution subsystem(s) of the drinking water system contained the required information.**

Work done on the system and observations were recorded on work orders. The work orders were stored and filed in both hard copy and electronic copy.

A log book is also kept at 555 Miller Avenue, Markham. The log book was reviewed on December 4, 2008. Entries were made with no indication of who recorded the entry, and/or the time of the event. On August 25, 2008 an entry with no indication of who made the entry or the time of the event, was scratched out. It was explained that this entry was recorded on the wrong day. Although the work orders (both hard copy and electronic copy) have the required information, the log book should reflect the work orders.

Refer to Summary of Best Practice Issues and Recommendations.

- \* **Logbook entries were made in chronological order.**
- \* **The record system allowed the reader to unambiguously identify the person who made the logbook entry.**

Although the work order logs identified the individual making the entry, the log book kept at 555 Miller Avenue, sometimes did not.

Refer to Summary of Best Practice Issues and Recommendations.

- \* **Entries in the logbook were made only by appropriate and authorized personnel.**
- \* **Records or other record keeping mechanisms confirmed that operational testing not performed by continuous monitoring equipment was being done by a certified operator, water quality analyst, or person who suffices the requirements of O. Reg. 170/03 7-5**

## **LOGBOOKS**

- \* **For every required operational test and every required sample, a record was made of the date, time, location, name of the person conducting the test and result of the test.**

This information is recorded on each chain of custody as well on work orders.

- \* **The operator-in-charge ensured that records were maintained of all adjustments made to the processes within his or her responsibility.**

- \* **Logs or other record keeping mechanisms were available for at least five (5) years.**

Records are kept on site and are sent annually to archives where, if immediately needed, they can be acquired within two hours. Records are also kept electronically in Hansen, which Markham commenced using in 2002.

## **CONTINGENCY/EMERGENCY PLANNING**

- \* **The owner had developed a written contingency/emergency plan as required by the Permit, Licence or Approval issued under Part V of the SDWA.**

The Town of Markham has an 'Emergency Response Procedure Manual', which lists the SOP's for four different levels of emergencies. The waterworks emergency plan also contains a 'Fan Callout System', contact information, and information concerning the responsibilities of key persons, staff and other agencies.

- \* **The contingency/emergency plan was available for reference by all staff as required by the Permit, Licence or Approval issued under Part V of the SDWA.**

The Town of Markham staff has been given the emergency plan. The most recent copy of the 'Fan Callout' document is also available on the Town's intranet site for all staff.

- \* **The contingency/emergency plan did provide for key equipment to be made available in the event of an emergency or upset condition.**

The Town of Markham has materials and spare equipment, stored at 555 Miller Avenue, which can be made available.

- \* **The contingency/emergency plan addressed spill scenarios.**

- \* **Clean-up equipment and materials were in place for the clean up of spills.**

## **SECURITY**

- \* **The owner had provided adequate security measures to protect components of the drinking-water system.**

The majority of the drinking water components are unexposed, sample stations are locked, and extra equipment is stored securely at 555 Miller Avenue, Markham.

## **CONSUMER RELATIONS**

- \* **Water conservation was being practiced by the owner or operating authority.**

Markham's by-law #105-95, outlines restrictions for water usage between June 1 and September 30. Markham's website also references Water Efficiency tips for the public.

## **CONSUMER RELATIONS**

- \* **A documented system that records consumer complaints, steps taken to determine the cause of the issue, and corrective measures taken to alleviate the cause and prevent its reoccurrence did exist.**

Consumer complaints are managed through the Hansen system.

- \* **Required documents were available free-of-charge during normal business hours at a location accessible to the public.**

Documents are available at the Contact Centre inside the Civic Centre at 101 Town Centre Blvd, Markham. Documents are also available at the Town of Markham's new office located at 8100 Warden Avenue, Markham.

- \* **The owner did take effective steps to advise users of the water system of the availability of Annual Reports.**

Notification to the public of the availability of the 2007 annual report was provided by the Town of Markham's internet site, and upon public request.

- \* **The owner posted the Annual Reports on the internet.**

## **CERTIFICATION AND TRAINING**

- \* **The overall responsible operator had been designated for each subsystem.**

The overall responsible operator (ORO) was Rob Flindall, Manager of Operations & Maintenance from January 1, 2008 to October 15, 2008. For the remainder of the inspection period the ORO was rotated weekly through the Waterworks Supervisor assigned to stand-by duties.

- \* **Operators in charge had been designated for all subsystems which comprised the drinking-water system.**
- \* **All activities that were undertaken by uncertified persons in the DW subsystems were overseen by persons having the prescribed qualifications.**
- \* **All operators possessed the required certification.**

- \* **Operator certificates or water quality analyst certificates were displayed in a conspicuous location at the workplace or at the premises from which the subsystem was managed.**

Operator certificates were on display at the Waterworks Operations Office at 555 Miller Avenue, Markham.

- \* **The classification certificates of the subsystems were conspicuously displayed at the workplace or at premises from which the subsystem was managed.**

The classification certificate was displayed at the Waterworks Operations Office at 555 Miller Avenue, and at the Waterworks Administration Office at 101 Town Centre Blvd.

- \* **An adequately licenced operator was designated to act in place of the overall responsible operator when the overall responsible operator was unable to act.**

The Markham Distribution System has a procedure in place for personnel coverage. As part of the procedure Waterworks Supervisors are assigned to stand-by duties on a rotational basis. The supervisor on stand-by is designated as the ORO.

**CERTIFICATION AND TRAINING**

- \* **The owner/operating authority was aware of the operator training and record keeping requirements, and they were taking reasonable steps to ensure that all operators receive the required training.**

The Town of Markham's Training Coordinator maintains a record of all operator training. A spreadsheet is maintained with the hours of training for each operator.

- \* **Operators were regularly trained with respect to the contents of the operations and maintenance manual and Contingency/Emergency Plan.**

In 2008, staff had a training session on the Contingency/Emergency Plan and on the emergency fan callout document. Records of the training were kept.

**WATER QUALITY MONITORING**

- \* **Relief from water quality monitoring requirements had not been granted.**
- \* **All microbiological water quality monitoring requirements for distribution samples were being met.**
- \* **All trihalomethanes water quality monitoring requirements prescribed by legislation were conducted within the required frequency.**
- \* **Trihalomethane samples were being collected from a point in the distribution system or connected plumbing system that was likely to have an elevated potential for the formation of trihalomethanes.**
- \* **The owner ensured that water samples were taken at the prescribed location.**
- \* **The owner had not established water quality goals over and above regulatory requirements.**
- \* **All sampling requirements for lead prescribed by schedule 15.1 of O. Reg. 170/03 were being met.**

The Town of Markham is required to collect one hundred and thirty (130) samples, per sampling period, in total for lead. Lead sampling records demonstrate that the requirements were achieved for the last two sampling periods.
- \* **All sampling requirements for alkalinity and pH prescribed by schedule 15.1 of O. Reg. 170/03 were being met.**
- \* **The owner was conducting sampling beyond the minimum legislative requirements.**

The Town of Markham tests for sodium, fluoride, nitrite and nitrates, which is not required by the distribution system.
- \* **Samples for chlorine residual analysis were tested using an acceptable portable device.**

**WATER QUALITY MONITORING**

- \* **The secondary disinfectant residual was measured as required for the distribution system.**

Chlorine residuals are collected daily and with every microbiology sample, as required.

- \* **Records confirmed that the maximum free chlorine residual in the distribution system was less than 4.0 mg/L or that the combined chlorine residual was less than 3.0 mg/L.**

The maximum combined chlorine residual for the inspection period (February 26, 2008 to December 3, 2008) was 1.50 mg/L on July 17, 2008.

- \* **Records confirmed that chlorine residual tests were being conducted at the same time and at the same location that microbiological samples were obtained.**
- \* **Records confirmed that disinfectant residuals were routinely checked at the extremities and "dead ends" of the distribution system.**
- \* **Testing for parameters required by legislation, Order, or a Permit, Licence or Approval issued under Part V of the SDWA was conducted by laboratories in Ontario licenced to test for that parameter, or by eligible laboratories outside Ontario.**  
  
Regulatory water samples are submitted for analysis to the York-Durham Regional Environmental Laboratory, which is a licensed laboratory by the Ministry of the Environment.
- \* **The drinking water system owner had submitted written notices to the Director that identified the laboratories that were conducting tests for parameters required by legislation, Order Certificate of Approval (OWRA) or a Permit, Licence or Approval issued under Part V of the SDWA.**  
  
Markham Distribution System has recently submitted a laboratory services notification (LSN) update on January 23, 2008. The LSN declares York-Durham Regional Environmental Laboratory in Pickering, Ontario, as their contracted laboratory.
- \* **Based on information provided by the owner/operator, samples were being taken and handled in accordance with instructions provided by the drinking-water system's laboratories.**
- \* **The owner indicated that the required records are kept and will be kept for the required time period.**

As previously mentioned, records are kept on site and are sent annually to archives where, if immediately needed, they can be acquired within two hours. Records are also kept electronically in Hansen, which Markham commenced using in 2002.

**WATER QUALITY ASSESSMENT**

- \* **The inspector collected audit samples during the inspection.**

Audit samples were collected on December 9, 2008, at the following sampling locations:

J08 – 10 Lemsford Drive

B05 – 280 Hillmount Road

A03 – 267 Calvert Road

J05 – 113 Fincham Avenue



## **WATER QUALITY ASSESSMENT**

- \* **Results of Ministry audit sampling met the standards included in the Ontario Drinking Water Quality Standards (O. Reg. 169/03) and O.Reg. 170/03.**
- \* **Records show that all water sample results taken during the review period met the Ontario Drinking Water Quality Standards (O.Reg. 169/03).**

During the inspection period total coliforms were detected 14 times, 4 of which were re-samples.

## **REPORTING & CORRECTIVE ACTIONS**

- \* **Corrective actions (as per Schedule 17) were taken to address adverse conditions, including any other steps that were directed by the Medical Officer of Health.**

During the inspection period, the Town of Markham reported 15 adverse water quality incidents to the Ministry's Spills Action Centre, including 14 total coliform, 4 of which were re-sample adverse results, and 1 low chlorine residual. The corrective actions were taken to address adverse conditions, as required.
- \* **All required notifications of adverse water quality incidents were immediately provided as per O.Reg. 170/03 16-6.**
- \* **All required notifications of adverse water quality incidents were provided as per O.Reg. 170/03 16-7.**
- \* **In instances where written notice of issue resolution was required by regulation, the notice was provided as per O.Reg. 170/03 16-9.**
- \* **All reporting requirements for lead plumbing samples were complied with as per schedule 15.1-9 of O. Reg. 170/03.**

The Town of Markham did not have any lead exceedances for either sampling periods (Dec. 15, 2007 – Apr. 15, 2008, and June 15, 2008 – October 15, 2008). Test result reports were sent to residents and non-residential sampling locations, within seven days of the results being received by the Town.
- \* **Annual Reports included the required information.**
- \* **The Annual Report was prepared by February 28th of the following year.**

The 2007 Annual Report was prepared on January 23, 2008.
- \* **Summary Reports for municipal council were completed on time, included the required content, and were distributed in accordance with the regulatory requirements.**

The summary report was submitted to Council on February 25, 2008.
- \* **All written notices, warning notices and reports were issued by the owner in a form provided by or approved by the Director.**
- \* **The system was registered with the Ministry and provided the required notice containing information about the system.**

**REPORTING & CORRECTIVE ACTIONS**

- \* **All changes to the system registration information were provided within ten (10) days of the change.**

All information was up to date with the exception of the population the drinking water system serves. The latest population update from the town placed the population at 268,599. Now the population has grown to approximately 293,700.

Refer to Summary of Best Practice Issues and Recommendations.

**OTHER INSPECTION FINDINGS**

- \* **The following issues were also noted during the inspection:**

1. It is recommended that the Town of Markham continue in its proactive leak detection program to identify factors contributing to unaccounted water loss.

2. It is recommended that the Town of Markham submit a Drinking Water System Profile Information form (publication #5386e) to the Ministry of the Environment (reg170\_formsubmission.moe@ontario.ca) to update the population served by the system. It is also recommended that if the population is updated in an annual report, the Town of Markham give written notice of the change within 10 days of the report being finalized.

3. It is recommended that although the work orders have the required information, the log book should reflect the work orders. The entries in the log book should also unambiguously identify the person making each entry and give the time of each event. Errors in the log book should be crossed out with a single line with the individual's identity made known (i.e. initials).

4. It is recommended that operating procedure #101, 'Adverse Water Quality Result Response SOP', be submitted to the undersigned inspector after revisions have been made.

- \* **The owner/operator had complied with all Orders or other control documents issued since the date of the previous inspection.**

There were two recommendations in last year's inspection report. The first recommendation was to continue in the proactive leak detection program to identify factors contributing to unaccounted water loss. Refer to Summary of Best Practice Issues and Recommendations for further recommendations from this inspection.

The second recommendation was to review operating procedure #101 to reflect the corrective actions listed in O. Reg. 170/03, Schedule 17-5 and 17-6, and submit the modified procedure to the issuing officer. Prior to the report being finalized, the operating procedure was modified accordingly and submitted. The Town of Markham is updating the procedure further and will send the revised version to the undersigned inspector. Refer to Summary of Best Practice Issues and Recommendations for further recommendations from this inspection.

**NON-COMPLIANCE WITH REGULATORY REQUIREMENTS AND ACTIONS REQUIRED**

This section provides a summary of all non-compliance with regulatory requirements identified during the inspection period, as well as actions required to address these issues. Further details pertaining to these items can be found in the body of the inspection report.

Not Applicable

## **SUMMARY OF BEST PRACTICE ISSUES AND RECOMMENDATIONS**

This section provides a summary of all best practice issues identified during the inspection period. Details pertaining to these items can be found in the body of the inspection report. Best Management Practices are recommendations and not mandatory requirements, but may lead to safe drinking water for the consumer.

In the interest of continuous improvement in the interim, it is recommended that owners and operators develop an awareness of the following practices and consider measures to implement them so that all drinking water systems continuously improve their processes.

### **1. The following issues were also noted during the inspection:**

#### **Recommendation:**

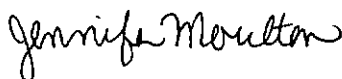
1. It is recommended that the Town of Markham continue in its proactive leak detection program to identify factors contributing to unaccounted water loss.
2. It is recommended that the Town of Markham submit a Drinking Water System Profile Information form (publication #5386e) to the Ministry of the Environment (reg170\_formsubmission.moe@ontario.ca) to update the population served by the system. It is also recommended that if the population is updated in an annual report, the Town of Markham should give written notice of the change within 10 days of the report being finalized.
3. It is recommended that although the work order logs have the required information, the log book should reflect the work order logs. The entries in the log book should also unambiguously identify the person making each entry and give the time of each event. Errors in the log book should be crossed out with a single line with the individual's identity made known (i.e. initials).
4. It is recommended that operating procedure #101, 'Adverse Water Quality Result Response SOP', be submitted to the undersigned inspector after revisions have been made.

**SIGNATURES**

Inspected By:

Jennifer Moulton

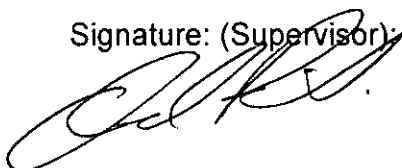
Signature: (Provincial Officer):



Reviewed &amp; Approved By:

Oral Binda

Signature: (Supervisor):



Review &amp; Approval Date:

Jan 22/09

Note: This inspection does not in any way suggest that there is or has been compliance with applicable legislation and regulations as they apply or may apply to this facility. It is, and remains, the responsibility of the owner and/or operating authority to ensure compliance with all applicable legislative and regulatory requirements.

## **APPENDIX A**

### **DRINKING WATER SYSTEM COMPONENTS DESCRIPTION**

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**DRINKING WATER SYSTEM COMPONENTS DESCRIPTION**

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**Name:** Markham Operation Office  
**Station Id #:** 2200041628001  
**Type:** Other  
**Sub Type:** Other

**Street Number:** 555 **Street Name:** Miller Ave

**Lot:** **Concession:**  
**Part:** **Reference Plan:**

**Map Datum:** NAD 83  
**Geo-Referencing Method:** GPS  
**Accuracy Estimate:** 10-30 Meters (Med Quality GPS)  
**Location Reference:** Entrance to Object **UTM Zone:** 17  
**UTM Northing:** 4852949 **UTM Easting:** 629972  
**Latitude:** **Longitude:**

---

**Name:** Distribution System Sampling Station  
**Station Id #:** J08  
**Type:** Other  
**Sub Type:** Other

**Street Number:** 10 **Street Name:** Lemsford Dr

**Lot:** **Concession:**  
**Part:** **Reference Plan:**

**Map Datum:** NAD 83  
**Geo-Referencing Method:** GPS  
**Accuracy Estimate:** 1-10 Meters (Good Quality GPS)  
**Location Reference:** Near Object **UTM Zone:** 17  
**UTM Northing:** 4857239 **UTM Easting:** 641628  
**Latitude:** **Longitude:**

---

**Name:** Distribution System Sampling Station  
**Station Id #:** A03  
**Type:** Other  
**Sub Type:** Other

**Street Number:** 267 **Street Name:** Calvert Rd

**Lot:** **Concession:**  
**Part:** **Reference Plan:**

---

<b>Map Datum:</b>	NAD 83		
<b>Geo-Referencing Method:</b>	GPS		
<b>Accuracy Estimate:</b>	1-10 Meters (Good Quality GPS)		
<b>Location Reference:</b>	Near Object	<b>UTM Zone:</b>	17
<b>UTM Northing:</b>	4859206	<b>UTM Easting:</b>	632290
<b>Latitude:</b>		<b>Longitude:</b>	

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**Name:** Distribution System Sampling Station  
**Station Id #:** J05  
**Type:** Other  
**Sub Type:** Other

**Street Number:** 113      **Street Name:** Fincham Ave  
**Lot:**      **Concession:**  
**Part:**      **Reference Plan:**

<b>Map Datum:</b>	NAD 83		
<b>Geo-Referencing Method:</b>	GPS		
<b>Accuracy Estimate:</b>	1-10 Meters (Good Quality GPS)		
<b>Location Reference:</b>	Near Object	<b>UTM Zone:</b>	17
<b>UTM Northing:</b>	4860859	<b>UTM Easting:</b>	639977
<b>Latitude:</b>		<b>Longitude:</b>	

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**Name:** Distribution System Sampling Station  
**Station Id #:** B05  
**Type:** Other  
**Sub Type:** Other

**Street Number:** 280      **Street Name:** Hillmount Rd  
**Lot:**      **Concession:**  
**Part:**      **Reference Plan:**

<b>Map Datum:</b>	NAD 83		
<b>Geo-Referencing Method:</b>	GPS		
<b>Accuracy Estimate:</b>	1-10 Meters (Good Quality GPS)		
<b>Location Reference:</b>	Near Object	<b>UTM Zone:</b>	17
<b>UTM Northing:</b>	4859685	<b>UTM Easting:</b>	630484
<b>Latitude:</b>		<b>Longitude:</b>	

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## **APPENDIX B**

### **CERTIFICATE OF APPROVAL**

**Ministry of the Environment**  
Environmental Assessment and  
Approvals Branch  
Floor 12A  
2 St Clair Ave W  
Toronto ON M4V 1L5  
Fax: (416)314-8452  
Telephone: (416) 314-8172

**Ministère de l'Environnement**  
Direction des évaluations et des  
autorisations environnementales  
Étage 12A  
2 av St Clair O  
Toronto ON M4V 1L5  
Télécopieur : (416)314-8452  
Téléphone : (416) 314-8172



August 1, 2006

Robert Flindall, Manager of Operations and Maintenance  
The Corporation of the Town of Markham  
101 Town Centre Boulevard  
Markham, Ontario  
L3R 9W3

Dear Sir:

**Re: Application for Approval of Municipal Drinking Water Systems  
Certificate of Approval  
Markham Town, Regional Municipality of York  
MOE Reference Number 4643-6NLJES**

Enclosed is the amended Certificate of Approval for the above noted water works, issued in accordance with Part V of the Safe Drinking Water Act. This certificate revokes and replaces the previously issued certificate, Certificate No. 9352-5PRHRG, issued on July 24, 2003.

If you have any questions regarding the above, please contact Robert Holtforster, P.Eng. at 416-212-4840.

Yours truly,

Aziz Ahmed, P.Eng.  
Director, Part V, SDWA

c: Drinking Water Supervisor, MOE York-Durham  
Robert Flindall, The Corporation of the Town of Markham



Ministry  
of the  
Environment

Ministère  
de  
l'Environnement

AMENDED CERTIFICATE OF APPROVAL  
MUNICIPAL DRINKING WATER SYSTEMS  
NUMBER 0955-6S9L9A  
Issue Date: August 4, 2006

The Corporation of the Town of Markham  
101 Town Centre Boulevard  
Markham, Ontario  
L3R 9W3

Site Location: Markham Distribution System  
101 Town Centre Boulevard  
Markham Town, Regional Municipality of York  
L3R 9W3

*Pursuant to the Safe Drinking Water Act, 2002, S.O. 2002, c. 32, and the regulations made thereunder and subject to the limitations thereof, this approval is issued under Part V of the Safe Drinking Water Act, 2002, S.O. 2002, c. 32 to:*

The Corporation of the Town of Markham  
101 Town Centre Boulevard  
Markham, Ontario  
L3R 9W3

### **PART 1 - DRINKING-WATER SYSTEM DESCRIPTION**

- 1.1 for those parts of a drinking-water distribution system serving the Town of Markham, that obtains treated water from the City of Toronto via the Region of York.
- 1.2 all in accordance with the applications and plans and other supporting documents listed in Schedule "A", and all other Schedules, which are attached to, and form part of this approval, except as specified in the conditions contained herein.

### **PART 2 - DEFINITIONS AND INFORMATION**

- 2.1 Words and phrases not defined in this approval shall be given the same meaning as those set out in the *Safe Drinking Water Act, 2002*, S.O. 2002, c. 32 and any regulations made in accordance with that act, unless the context requires otherwise.

## 2.2 In this approval

“adverse effect”, “contaminant”, “impairment” and “natural environment” shall have the same meanings as in the *Environmental Protection Act*, R.S.O.1990, c. E.19 and the *Ontario Water Resources Act*, R.S.O.1990, c. O.40;

"approval" means this entire approval document, issued in accordance with section 36 of the *SDWA*, and includes any schedules to it;

"Director" means a Director appointed pursuant to s. 6 of the *SDWA* for the purposes of Part V of the *SDWA*;

"drinking-water system" includes the works set out in Part 1;

"operating authority" and "owner" mean, in addition to the respective meanings given in the Act, The Corporation of the Town of Markham;

"provincial officer" means a provincial officer appointed pursuant to s. 8 of the *SDWA*;

“rated capacity” means the maximum flow rate of water which can be treated when operating the drinking-water system under design conditions;

"*SDWA*" means the *Safe Drinking Water Act, 2002, S.O. 2002, c. 32*, as amended.

## **PART 3 - GENERAL**

### **Compliance**

- 3.1 The owner and operating authority shall operate the drinking-water system in accordance with the *SDWA*, any applicable regulations made thereunder, and this approval.
- 3.2 Despite any condition of this approval to the contrary, the owner and operating authority set out in Part 2 are jointly and severally liable to comply with all conditions of this approval.
- 3.3 The owner and operating authority shall ensure that any person authorized to carry out work on or operate any aspect of the drinking-water system has been informed of the *SDWA*, all applicable regulations made in accordance with that act, and this approval and shall take all reasonable measures to ensure any such person complies with the same.
- 3.4 A copy of this approval shall be kept in a conspicuous place so that it is available for reference by all persons responsible for all or part of the operation of the drinking-water system.

### **Build, etc. in Accordance**

- 3.5 Except as otherwise provided by this approval, the drinking-water system shall be designed, developed, built, operated and maintained in accordance with Part 1 above and the documentation listed in Schedule "A".

### **Interpretation**

- 3.6 Where there is a conflict between the provisions of this approval and any other document, the following hierarchy shall be used to determine the provision that takes precedence:

- i. The *SDWA*;
- ii. a condition imposed in this approval in accordance with s. 38 of the *SDWA*;
- iii. any regulation made under the *SDWA*;
- iv. this approval;
- v. any application documents listed in Schedule "A" from most recent to earliest; and
- vi. all other documents listed in Schedule "A" from most recent to earliest.

- 3.7 The requirements of this approval are severable. If any requirement of this approval, or the application of any requirement of this approval to any circumstance, is held invalid or unenforceable, the application of such requirement to other circumstances and the remainder of this approval shall not be affected thereby.

- 3.8 Nothing in this approval shall be read to provide relief from the need for strict compliance with the *Environmental Assessment Act*, R.S.O. 1990, c E.18.

### **Other Legal Obligations**

- 3.9 The issuance of, and compliance with the conditions of, this approval does not:
- i. relieve any person of any obligation to comply with any provision of any applicable statute, regulation or other legal requirement; or
  - ii. limit in any way the authority of the Ministry to require certain steps be taken or to require the owner to furnish any further information related to compliance with this approval.
- 3.10 For greater clarity, nothing in this approval shall be read to provide relief from regulatory requirements in accordance with section 38 of the *SDWA*, except as provided in Part 9.

### **Adverse Effects**

- 3.11 Nothing in this approval shall be read as to permit: i) the discharge of a contaminant into the natural environment that causes or is likely to cause an adverse effect; or ii) the discharge of any material of any kind into or in any waters or on any shore or bank thereof or into or in any place that may impair the quality of the water of any waters.
- 3.12 All reasonable steps shall be taken to minimize and ameliorate any adverse effect on the natural environment or impairment of the quality of water of any waters resulting from the operation of the drinking-water system including such accelerated or additional monitoring as may be necessary to determine the nature and extent of the effect or impairment.
- 3.13 Fulfillment of one or more conditions imposed by this approval does not eliminate the requirement to fulfill any other condition of this approval or the requirements of any applicable statute, regulation, or other legal requirement resulting from any act or omission that causes or is likely to cause an adverse effect on the natural environment or the impairment of water quality.

### **Change of Owner**

- 3.14 The owner or the operating authority, as the case may be, shall notify the Director, in writing, of any of the following changes within 30 days of the change occurring:
- i. change of owner or operating authority;
  - ii. change of address;
  - iii. change of partners where the owner is or at any time becomes a partnership, and a copy of the most recent declaration filed under the *Business Names Act*, R.S.O. 1990, c. B17; or
  - iv. change of name of the corporation where the owner or operating authority is or at any time becomes a corporation, and a copy of the most current information filed under the *Corporations Information Act*, R.S.O. 1990, c. C.39.
- 3.15 In the event of any change in ownership of the drinking-water system, other than change to a successor municipality, the owner shall notify the successor of and provide the successor with a copy of this approval, and the owner shall provide a copy of the notification to the district manager of the local office of the Ministry and the Director.

### **Inspections**

- 3.16 No person shall hinder or obstruct a provincial officer in the performance of his or her duties, including any and all inspections authorized by the *SDWA*.

## Information

- 3.17 Any information requested, by the Ministry, concerning the drinking-water system and its operation under this approval, including but not limited to any records required to be kept by this approval shall be provided to the Ministry, upon request.
- 3.18 Records required by or created in accordance with this approval, unless specifically referenced in s. 12 of O. Reg. 170/03, shall be retained for at least 5 years in a location where a provincial officer who is inspecting the treatment system can conveniently view them.

## **PART 4 - RELIEF FROM REGULATORY REQUIREMENTS**

### **Relief from regulatory requirements**

- 4.1 Subject to Condition 4.2, the Owner is not required to comply with the following provisions of O. Reg. 170/03:
- i. Section 17-9 of Schedule 17

### **Conditions in exchange for relief from regulatory requirements**

- 4.2 If a report is required to be made under section 18 of the SDWA in respect of *Aeromonas* spp., *Pseudomonas aeruginosa*, *Staphylococcus aureus*, *Clostridium* spp., or fecal *streptococci* (Group D *streptococci*), the owner shall ensure that the following corrective action is taken:
1. Immediately resample and test.
  2. If *Aeromonas* spp., *Pseudomonas aeruginosa*, *Staphylococcus aureus*, *Clostridium* spp., or fecal *streptococci* (Group D *streptococci*) are detected under paragraph 1, immediately flush the watermain to ensure that a combined chlorine residual of at least 0.25 mg/L is achieved at all points in the affected parts of the distribution system.
  3. Continue to resample and test until *Aeromonas* spp., *Pseudomonas aeruginosa*, *Staphylococcus aureus*, *Clostridium* spp., or fecal *streptococci* (Group D *streptococci*) are not detected in all of the samples from two consecutive sets of samples taken 24 to 48 hours apart or as otherwise directed by the Medical Officer of Health.
  4. Take such other steps as are directed by the Medical Officer of Health.

## **SCHEDULE - A**

The following supporting documents form part of this approval.

Application dated April 5, 2006

**This Certificate of Approval revokes and replaces Certificate(s) of Approval No. 9352-5PRHRG issued on July 24, 2003**

*All or part of this decision may be reviewable in accordance with the provisions of Part X of the SDWA. In accordance with Section 129(1) of the Safe Drinking Water Act, Chapter 32 Statutes of Ontario, 2002, as amended, you may by written notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this notice, require a hearing by the Tribunal. Section 129(2) sets out a procedure upon which the 15 days may be extended by the Tribunal. Section 129(3) of the Safe Drinking Water Act, Chapter 32 Statutes of Ontario, 2002, provides that the Notice requiring the hearing shall state:*

1. The aspect of the decision, including the portion of the permit, licence, approval, order or notice of administrative penalty in respect of which the hearing is required; and
2. The grounds for review to be relied on by the person at the hearing.

Except with leave of the Tribunal, a person requiring a hearing in relation to a reviewable decision is not entitled to,

- (a) a review of an aspect of the decision other than that stated in the notice requiring the hearing; or
- (b) a review of the decision other than on the grounds stated in the notice

*The Notice should also include:*

1. The name of the appellant;
2. The address of the appellant;
5. The Certificate of Approval number;
6. The date of the Certificate of Approval;
7. The name of the Director;
8. The municipality within which the works are located;

*And the Notice should be signed and dated by the appellant.*

*This Notice must be served upon:*

The Secretary\*  
Environmental Review Tribunal  
2300 Yonge St., Suite 1700  
P.O. Box 2382  
Toronto, Ontario  
M4P 1E4

AND

The Director  
Part V, *Safe Drinking Water Act*, 2002  
Ministry of the Environment  
2 St. Clair Avenue West, Floor 12A  
Toronto, Ontario  
M4V 1L5

**\* Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 314-4600, Fax: (416) 314-4506 or [www.ert.gov.on.ca](http://www.ert.gov.on.ca)**

*The above noted water works are approved under Part V of the Safe Drinking Water Act.*

DATED AT TORONTO this 4th day of August, 2006



A handwritten signature in black ink, appearing to read "A. Ahmed", is written over a horizontal line.

Aziz Ahmed, P.Eng.

Director

Part V *of the Safe Drinking Water Act, 2002*

RH/

c: District Manager, MOE York-Durham  
Robert Flindall, The Corporation of the Town of Markham

## **APPENDIX C**

### **MOE AUDIT SAMPLE RESULTS**

Login: **C165081**

Program Code 130071401      Program: MOE OPERATIONS DIVISION  
Study: WATER, COMMUNAL  
Project: CENTRAL REG. - YORK-DURHAM DIS  
Activity: WTP MUNIC INSPECT/ADVERS NOTIF  
Organization: District Manager York-Durham

Org. Id: 4514

Mail this copy to :

MOULTON, JENN  
MOE - YORK-DURHAM DISTRICT OFFICE  
230 WESTNEY ROAD SOUTH, 5TH FLOOR  
AJAX,ONT  
L1S 7J5

Final reports to : MOULTON, JENN  
RAPHAEL, PAULINE  
SAFEDRINKINGWATERBRANCH.CALENDAR.MOE

Approved by: PAUL YANG Manager, Applied Chromatography Section  
Inquires to: RUSTY MOODY  
PAUL YANG

Approved date: Dec. 22, 2008  
Telephone : 416-235-5863  
416-235-6004

**LOGIN DESCRIPTION:** 220004162 MARKHAM DISTRIBUTION SYSTEM JENNIFER MOULTON 905-427-5618

The results relate only to items tested.  
To provide customer service feedback on this report and/or other services provided by LaSB, please contact the LaSB HelpDesk at 416-235-6030 or the Customer Service Manager at 416-235-5831.

Login: **C165081**

Field Id JLM-MRKM-01	Station ID 2200041628002 Sample ID C165081-0001	Sample Location Description J08 10 LEMS FORD DR. DISTRIBUTION	Sampling Date 09 DEC 2008	Time 11:35	Zone 5	Sampler Information
MOE*LIMS Products Requested:		Sample Comment Description				
WD	E3144B	VOL3144	WD	E3226A	PA3226	WD E3473 PB3473

Field Id JLM-MRKM-02	Station ID 2200041628002 Sample ID C165081-0002	Sample Location Description B05 280 HILLMOUNT ROAD DISTRIBUTION	Sampling Date 09 DEC 2008	Time 10:20	Zone 5	Sampler Information
MOE*LIMS Products Requested:		Sample Comment Description				
WD	E3144B	VOL3144	WD	E3226A	PA3226	WD E3473 PB3473

Field Id JLM-MRKM-03	Station ID 2200041628002 Sample ID C165081-0003	Sample Location Description J05 113 FINCHAM AVE. DISTRIBUTION	Sampling Date 09 DEC 2008	Time 10:55	Zone 5	Sampler Information
MOE*LIMS Products Requested:		Sample Comment Description				
WD	E3226A	PA3226				

Field Id JLM-MRKM-04	Station ID 2200041628002 Sample ID C165081-0004	Sample Location Description A03 267 CALVERT ROAD DISTRIBUTION	Sampling Date 09 DEC 2008	Time 10:05	Zone 5	Sampler Information
MOE*LIMS Products Requested:		Sample Comment Description				
WD	E3226A	PA3226				



Login: **C165081**

Field ID: Sample ID: MOE*LIMS ID: Station ID: Collect Date: Sample Location Description:		JLM-MRKM-01 C165081-0001 2008WD50-00081 2200041628002 09 DEC 2008 J08 10 LEMS FORD DR. DISTRIBUTION				JLM-MRKM-02 C165081-0002 2008WD50-00082 2200041628002 09 DEC 2008 B05 280 HILLMOUNT ROAD DISTRIBUTION				JLM-MRKM-03 C165081-0003 2008WD50-00083 2200041628002 09 DEC 2008 J05 113 FINCHAM AVE. DISTRIBUTION			
Sample Comments Description:													
Listid	Parmname	Value	Units	Qual	Rmk1	Value	Units	Qual	Rmk1	Value	Units	Qual	Rmk1
3144L1	Chloroethene	.05	ug/L	<=W		.05	ug/L	<=W		See Non-Target Textual result			
	1,1-dichloroethene	.05	ug/L	<=W		.05	ug/L	<=W					
	Dichloromethane	.2	ug/L	<=W		.2	ug/L	<=W					
	Tert-butyl methyl ether	.05	ug/L	<=W		.05	ug/L	<=W					
	trans-1,2-dichloroethene	.05	ug/L	<=W		.05	ug/L	<=W					
	Diisopropylether	.05	ug/L	<=W		.05	ug/L	<=W					
	1,1-dichloroethane	.05	ug/L	<=W		.05	ug/L	<=W					
	cis-1,2-dichloroethene	.05	ug/L	<=W		.05	ug/L	<=W					
	Chloroform	4.4	ug/L			4.8	ug/L						
	1,1,1-trichloroethane	.05	ug/L	<=W		.05	ug/L	<=W					
	Carbon tetrachloride	.2	ug/L	<=W		.2	ug/L	<=W					
	1,2-dichloroethane	.05	ug/L	<=W		.05	ug/L	<=W					
	Benzene	.05	ug/L	<=W		.05	ug/L	<=W					
	Trichloroethene	.05	ug/L	<=W		.05	ug/L	<=W					
	1,2-dichloropropane	.05	ug/L	<=W		.05	ug/L	<=W					
	Bromodichloromethane	4.6	ug/L			5.0	ug/L						
	Dichloroacetone nitrile	0.5	ug/L	<T		0.5	ug/L	<T					
	Toluene	.05	ug/L	<=W		.05	ug/L	<=W					
	1,1,2-trichloroethane	.1	ug/L	<=W		.1	ug/L	<=W					
	Tetrachloroethene	.05	ug/L	<=W		.05	ug/L	<=W					
	Dibromochloromethane	3.0	ug/L			3.2	ug/L						
	1,2-dibromoethane	.1	ug/L	<=W		.1	ug/L	<=W					
	Chlorobenzene	.05	ug/L	<=W		.05	ug/L	<=W					
	Ethylbenzene	.05	ug/L	<=W		.05	ug/L	<=W					
	m- and p-xylene	.05	ug/L	<=W		.05	ug/L	<=W					
	o-xylene	.05	ug/L	<=W		.05	ug/L	<=W					
	Styrene	.05	ug/L	<=W		.05	ug/L	<=W					
	Bromoform	.5	ug/L	<=W		.5	ug/L	<=W					
	1,1,2,2-tetrachloroethane	.2	ug/L	<=W		.2	ug/L	<=W					
	1,3-dichlorobenzene	.05	ug/L	<=W		.05	ug/L	<=W					
	1,4-dichlorobenzene	.05	ug/L	<=W		.05	ug/L	<=W					
	1,2-dichlorobenzene	.05	ug/L	<=W		.05	ug/L	<=W					
	Trihalomethanes; total	12.0	ug/L			13.0	ug/L						
3226L1	NT: Total Coliforms	See Non-Target Textual result				See Non-Target Textual result				See Non-Target Textual result			
3473L3	Lead	.42	ug/L	+/-0.36		.31	ug/L	+/-0.31					

Login: **C165081**

Field ID:	JLM-MRKM-04				
Sample ID:	C165081-0004				
MOE*LIMS ID:	2008WD50-00084				
Station ID:	2200041628002				
Collect Date:	09 DEC 2008				
Sample Location Description:	A03 267 CALVERT ROAD DISTRIBUTION				
Sample Comments Description:					
Listid	Parmname	Value	Units	Qual	Rmk1
3226L1	NT: Total Coliforms	See Non-Target Textual result			

Login: **C165081**

CODE	DESCRIPTION
NDAT	NO DATA: ABSENT NT: TOTAL COLIFORMS
NDDN	NO DATA: NOT DETECTED NT: DETERIORATION INDICATORS
<T	A MEASURABLE TRACE AMOUNT:INTERPRET WITH CAUTION
<=W	NO MEASURABLE RESPONSE (ZERO): <REPORTED VALUE
BG	BACTERIAL GROWTH DETECTED AT 48 HR. NO ACID/GAS
NDAE	NO DATA: ABSENT NT: ESCHERICHIA COLI

#### NON-TARGET TEXTUAL RESULT

Sample ID: C165081-0001	Listid : 3226L1	Parmname : NT: Total Coliforms	Value:	Units: c/100mL	Qual: NDAT	Remarks:
Absent						
Sample ID: C165081-0001	Listid : 3226L1	Parmname : NT: Escherichia coli	Value:	Units: c/100mL	Qual: NDAE	Remarks:
Absent						
Sample ID: C165081-0001	Listid : 3226L1	Parmname : NT: Deterioration Indicators	Value:	Units: c/100mL	Qual: NDDN	Remarks: BG
Not Detected						
Sample ID: C165081-0002	Listid : 3226L1	Parmname : NT: Total Coliforms	Value:	Units: c/100mL	Qual: NDAT	Remarks:
Absent						
Sample ID: C165081-0002	Listid : 3226L1	Parmname : NT: Escherichia coli	Value:	Units: c/100mL	Qual: NDAE	Remarks:
Absent						
Sample ID: C165081-0002	Listid : 3226L1	Parmname : NT: Deterioration Indicators	Value:	Units: c/100mL	Qual: NDDN	Remarks:
Not Detected						
Sample ID: C165081-0003	Listid : 3226L1	Parmname : NT: Total Coliforms	Value:	Units: c/100mL	Qual: NDAT	Remarks:
Absent						
Sample ID: C165081-0003	Listid : 3226L1	Parmname : NT: Escherichia coli	Value:	Units: c/100mL	Qual: NDAE	Remarks:
Absent						
Sample ID: C165081-0003	Listid : 3226L1	Parmname : NT: Deterioration Indicators	Value:	Units: c/100mL	Qual: NDDN	Remarks:
Not Detected						



Login: **C165081**

#### NON-TARGET TEXTUAL RESULT

Sample ID: C165081-0004	Listid : 3226L1	Parmname : NT: Total Coliforms	Value:	Units: c/100mL	Qual: NDAT	Remarks:
Absent						
Sample ID: C165081-0004	Listid : 3226L1	Parmname : NT: Escherichia coli	Value:	Units: c/100mL	Qual: NDAE	Remarks:
Absent						
Sample ID: C165081-0004	Listid : 3226L1	Parmname : NT: Deterioration Indicators	Value:	Units: c/100mL	Qual: NDDN	Remarks:
Not Detected						

#### TEXT COMMENTS

#### Product Completion

Sample ID	Matrix	Method	Product	Analytical Department	Completion Date	By
C165081-0001	WD	E3144B	VOL3144	4410	12-DEC-08	SALEMIRO
C165081-0001	WD	E3226A	PA3226	6510	11-DEC-08	CHOWJA
C165081-0001	WD	E3473	PB3473	6410	22-DEC-08	MOODYRU
C165081-0002	WD	E3144B	VOL3144	4410	12-DEC-08	SALEMIRO
C165081-0002	WD	E3226A	PA3226	6510	11-DEC-08	CHOWJA
C165081-0002	WD	E3473	PB3473	6410	22-DEC-08	MOODYRU
C165081-0003	WD	E3226A	PA3226	6510	11-DEC-08	CHOWJA
C165081-0004	WD	E3226A	PA3226	6510	11-DEC-08	CHOWJA

\*\*\* End of Report \*\*\*

**APPENDIX D**

**INSPECTION RATING REPORT**

## **APPLICATION OF THE RISK METHODOLOGY USED FOR MEASURING MUNICIPAL DRINKING WATER SYSTEM INSPECTION RESULTS (FY 2008/2009)**

The Ministry of the Environment (MOE) has a rigorous and comprehensive inspection program for municipal residential drinking water systems (MRDWS). Its objective is to determine the compliance of MRDWS with requirements under the *Safe Drinking Water Act, 2002*, associated regulations and MOE Certificates of Approval (CofAs). It is the responsibility of the municipal residential drinking water system owner to ensure their drinking water systems are in compliance with all applicable legal requirements.

This document describes the risk rating methodology which will be applied to the findings of the Ministry's MRDWS inspection results starting in fiscal 2008/2009. The primary goals of introducing this type of assessment are to encourage ongoing improvement of these systems and to establish a way to measure their improvements.

The Ministry's Municipal Residential Drinking Water Inspection Protocol contains up to 14 inspection modules and consists of up to 117 regulatory questions. Those protocol questions are also linked to definitive guidance that Ministry inspectors use when conducting MRDWS inspections. The questions address a wide range of regulatory issues, from administrative procedures to drinking water quality monitoring. Additionally, the inspection protocol contains many other non-regulatory questions.

A team of drinking water specialists in the Ministry have assessed each of the inspection protocol regulatory questions to determine the risk of having a response in the negative (i.e. not complying with the regulatory framework) that would compromise the delivery of safe drinking water. This assessment was based on established provincial risk assessment principles, with each question receiving an assigned risk rating. Based on the number of areas where a system is deemed to be non-compliant during the inspection, and the significance of these areas to administrative, environmental, and health consequences, a risk-based inspection rating is calculated by the Ministry for each MRDWS.

A low inspection rating would not necessarily mean that the drinking water provided by that system is unsafe; however, it does indicate the degree to which there is room for improvement in meeting the province's regulatory requirements.

The inspection rating for a drinking water system will reflect the inspection results of the specific DWS for the reporting year. When the methodology is applied consistently over a period of years, it can serve as a comparative measure both provincially and in relation to the individual system. Each MRDWS and the public will be able to track its performance over time, which will encourage continuous improvement and allow systems to identify specific areas requiring attention.

This methodology for assessing inspection findings will be used as a tool to track progress towards the Chief Drinking Water Inspector's goal of achieving 100% compliance with the regulatory framework on a province-wide basis.

## **Determining Potential to Compromise the Delivery of Safe Water**

As noted, each MRDWS Inspection Protocol question was assessed by MOE drinking water specialists to determine the potential to compromise the delivery of safe water using a risk management approach that is aligned with the Government of Ontario's Inspections, Investigations and Enforcement (II&E) Risk Management Framework which, in turn, is built on a universally accepted risk assessment method. Risk management is a systematic approach to identifying potential hazards; understanding the likelihood and consequences of the hazards; and taking steps to reduce their risk if necessary and as appropriate.

The Government of Ontario mandated the II&E Secretariat to address the specific challenges of managing risk in the context of Ontario's regulatory environment and across a variety of ministry program areas. The work of the II&E Secretariat resulted in the development of the II&E Risk Management Framework which has subsequently been adopted as the definitive risk management tool in the Ontario Public Service.

The II&E Risk Management Framework provides a formula to be used in the determination of risk:

$$\text{RISK} = \text{LIKELIHOOD (of the consequence occurring)} \times \text{CONSEQUENCE}$$

Every regulatory question in the MRDWS Inspection Protocol possess' a "likelihood (L)" and an assigned "consequence (C)" value as described in Table 1 and Table 2.

**Table 1**

<b>Likelihood of Consequence Occurring</b>	<b>Likelihood Value</b>
<b>0% - 0.99% (Possible but highly unlikely)</b>	<b>0</b>
<b>1 – 10% (Unlikely)</b>	<b>1</b>
<b>11 – 49% (Possible)</b>	<b>2</b>
<b>50 – 89% (Likely)</b>	<b>3</b>
<b>90 – 100% (Almost Certain)</b>	<b>4</b>

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The consequence values (0 through 8) have been selected to align with other risk-based programs and projects currently under development or in use within the Ministry (as outlined in Table 2).

**Table 2**

<b>Consequence</b>	<b>Consequence Value</b>
<b><i>Medium</i></b> Administrative Consequence	<b>1</b>
<b><i>Major</i></b> Administrative Consequence	<b>2</b>
<b><i>Minor</i></b> Environmental Consequence	<b>3</b>
<b><i>Minor</i></b> Health Consequence	<b>4</b>
<b><i>Medium</i></b> Environmental Consequence	<b>5</b>
<b><i>Major</i></b> Environmental Consequence	<b>6</b>
<b><i>Medium</i></b> Health Consequence	<b>7</b>
<b><i>Major</i></b> Health Consequence	<b>8</b>

The Question Risk Rating for each MRDWS legislative inspection question is derived from an evaluation of every possible consequence and its corresponding likelihood of occurrence:

- All levels of consequence are evaluated for their potential to occur
- Greatest of all the combinations is selected

The Question Risk Rating quantifies the risk of non-compliance of each question relative to the others. Questions with higher values are those with a potentially more significant impact on drinking water safety and a higher likelihood of occurrence. The highest possible value would be 32 ( $4 \times 8$ ) and the lowest would be 0 ( $0 \times 1$ ).

Table 3 presents a sample Question Risk Rating determination.

Table 3

Does the Operator in Charge ensure that the equipment and processes are monitored, inspected and evaluated?							
Risk = Likelihood × Consequence							
C=1	C=2	C=3	C=4	C=5	C=6	C=7	C=8
Medium Administrative Consequence	Major Administrative Consequence	Minor Environmental Consequence	Minor Health Consequence	Medium Environmental Consequence	Major Environmental Consequence	Medium Health Consequence	Major Health Consequence
L=4 (Almost Certain)	L=1 (Unlikely)	L=2 (Possible)	L=3 (Likely)	L=3 (Likely)	L=1 (Unlikely)	L=3 (Likely)	L=2 (Possible)
R=4	R=2	R=6	R=12	R=15	R=6	R=21	R=16

### Application of the Methodology to Inspection Results

Based on the results of a MRDWS inspection, an overall inspection risk rating is calculated. During an inspection, inspectors answer the questions that relate to regulatory compliance and input their responses as “yes”, “no” or “not applicable” into the Ministry’s Laboratory & Waterworks Inspection System (LWIS) database. A “no” response indicates non-compliance. The maximum number of regulatory questions asked by an inspector varies by system (e.g. distribution, stand-alone), type of inspection (e.g. focused, detailed), source type (e.g. groundwater, surface water) as each inspection is based on a list of questions targeted to that individual MRDWS.

The question risk ratings of all non-compliant answers are summed and divided by the sum of the question risk ratings of all questions asked (maximum question rating). The resulting inspection risk rating is subtracted from 100% to arrive at a Final Inspection Rating.

Table 4 provides a **sample** inspection rating for a hypothetical inspection of two questions. In this example, the risk value of all non-compliant responses is 2 and the maximum risk value of all the questions asked is 6. Based on the inspection findings, the MRDWS would have a Total Non-Compliance Rating of 33% (room for improvement) and a Total Inspection Rating of 66%.

Table 4

Inspection Question	Likelihood Value	Consequence Value	Question Risk Rating	Compliant (Y–N–N/A)	Non-Compliance Rating
Does the Operator in Charge ensure that the equipment and processes are monitored, inspected and evaluated?	3 (Likely)	7 ( <i>Medium</i> Health Consequence)	21	NO	21 / 21
Are all required microbiological water quality monitoring requirements being met?	2 (Possible)	8 ( <i>Major</i> Health Consequence)	16	YES	0 / 16
Maximum Question Rating			37		
Inspection Risk Rating			21 / 37 = 56%		
Final Inspection Rating			100% - 56% = 44%		

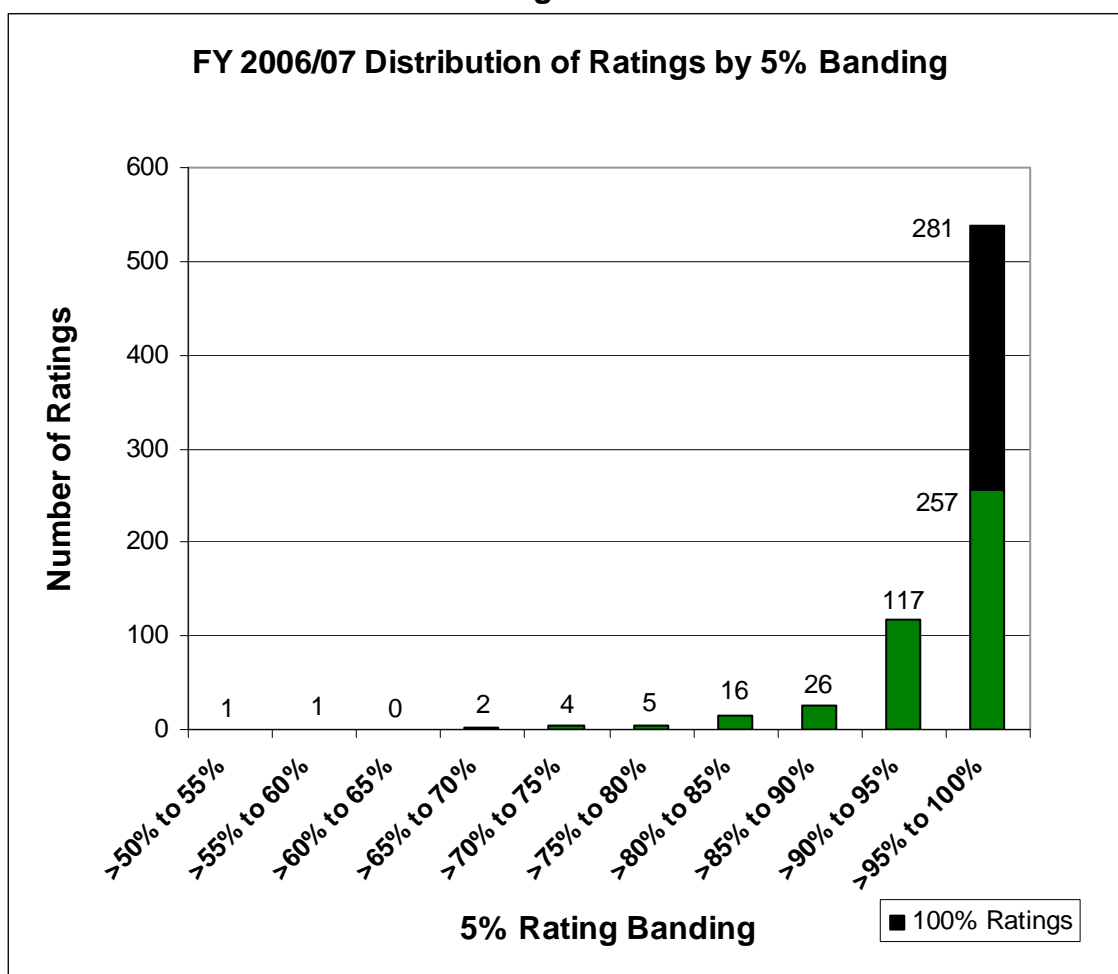
The result of applying this risk-based methodology to inspection results is that the resulting rating accounts for a variety of non-compliance issues. A relatively low rating may result from incidents of non-compliance with one or two high risk requirements, or it may result from incidents of non-compliance with several medium or low risk requirements. Generally, it speaks to the overall efforts of a MRDWS to comply with all of the regulatory requirements that pertain to safe drinking water in the Province of Ontario.

### Application of the Proposed Methodology for Public Reporting

The individual MRDWS Total Inspection Ratings will be published, as a banded result, in the Ministry's Chief Drinking Water Inspector's Annual Report covering the current fiscal inspection year.

Figure 1 presents the results of the Fiscal 2006-2007 annual inspections using the 5% banding as described above. Using this method, individual DWS can determine how they compare against all the other inspected facilities without being exposed to individual facility results.

Figure 1



## Reporting Results to MRDWS Owners/Operators

A summary of inspection findings for each system will be generated in the form of a ***“Ministry of the Environment - Inspection Summary Rating Record (IRR)”***. The findings are grouped into the 14 possible modules of the inspection protocol which would provide the MRDWS owner/operator with information on the areas where they need to improve. The 14 modules are:

1. Source
2. Permit to Take Water
3. Capacity Assessment
4. Treatment Processes
5. Process Wastewater
6. Distribution System
7. Operations Manuals
8. Logbooks



9. Contingency and Emergency Planning
10. Consumer Relations
11. Certification and Training
12. Water Quality Monitoring
13. Reporting, Notification and Corrective Actions
14. Other Inspection Findings

## **Changes to the IRR Methodology Relative to Previous Fiscal Inspection Years**

The Ministry of the Environment assured MRDWS stakeholders that the rating methodology would be reviewed every three years. This three year period concludes with the beginning of the current 2008/09 inspection year.

A comprehensive evaluation of the Inspection Rating model used to date revealed numerous areas for improvement:

- Chronic administrative issues & high ratings
- Specific situations (“grey areas”) required Supervisor/Manager intervention
- Inspection ratings did not fully integrate detailed risk management principles

The consequence values that were assigned to each relevant regulatory question remained unchanged from April 1, 2005 to March 31, 2008. The rating methodology used over those three years has been modified and now represents an improved metric for the evaluation the risk/safety of operations at MRDWS. This improvement represents a continuous improvement initiative.

Another improvement for the current fiscal inspection year involves the distribution of both the Inspection Report and the IRR immediately at the conclusion of each MRDWS inspection.

Ministry of the Environment - Inspection Summary Rating Record (Reporting Year - 2008-2009)

**DWS Name:** MARKHAM DISTRIBUTION SYSTEM  
**DWS Number:** 220004162  
**DWS Owner:** Markham, The Town Of  
**Municipal Location:** Markham

**Regulation:** O.REG 170/03  
**Category:** Large Municipal Residential System  
**Type Of Inspection:** Standalone  
**Inspection Date:** December 3, 2008  
**Ministry Office:** York-Durham District

**Maximum Question Rating:** 417

Inspection Module	Non-Compliance Rating
Treatment Processes	0 / 36
Operations Manuals	0 / 28
Logbooks	0 / 42
Contingency/Emergency Planning	0 / 15
Consumer Relations	0 / 16
Certification and Training	0 / 51
Water Quality Monitoring	0 / 130
Reporting & Corrective Actions	0 / 91
Other Inspection Findings	0 / 8
<b>TOTAL</b>	<b>0 / 417</b>

**Inspection Risk Rating** 0.00%

**FINAL INSPECTION RATING:** 100.00%

Ministry of the Environment - Detailed Inspection Rating Record (Reporting Year - 2008-2009)

**DWS Name:** MARKHAM DISTRIBUTION SYSTEM  
**DWS Number:** 220004162  
**DWS Owner:** Markham, The Town Of  
**Municipal Location:** Markham

**Regulation:** O.REG 170/03  
**Category:** Large Municipal Residential System  
**Type Of Inspection:** Standalone  
**Inspection Date:** December 3, 2008  
**Ministry Office:** York-Durham District

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**Maximum Question Rating:** 417

<b>Inspection Risk Rating</b>	<b>0.00%</b>
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<b>FINAL INSPECTION RATING:</b>	<b>100.00%</b>
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