



City of Markham Water Revenue Audit – Follow Up

June 18, 2018

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June 18, 2018

Mayor and Members of Council,

Pursuant to MNP LLP's appointment to provide Auditor General Services, I am pleased to present the Water Revenue Audit Follow-Up Report ("Follow-Up Report") of the Auditor General for the City of Markham ("City"). This Follow-Up Report provides a status update on management's remediation of the observations and recommendations made in the Water Revenue Audit issued on February 21, 2017.

As reported in the February 2017 audit report, the City had adequate procedures in place over the water revenue process; and, the audit found robust, efficient and effective internal controls surrounding water revenue billing and collection. Furthermore, there were several strengths noted in the areas of quality management; internal controls over metering, billing, and arrears management; and, infrastructure leakage management.

The results of the audit identified nine observations (one medium and eight low priority) which included conducting database verification procedures, enhancing process documentation, leveraging technological improvements and introducing "right to audit" clauses in the Shared Services Agreements ("SSA").

As part of the Auditor General's audit plan, we conducted follow-up procedures to determine the status of, as well as an evaluation of the effectiveness of, management's activities to remediate the nine observations identified in the February 2017 audit. This Follow-Up Report also provides any additional recommendations, if necessary.

The Follow-Up Report was discussed with the City's management and executive leadership team, who have reviewed and provided their responses within, as applicable.

This Follow-Up Report will be posted on the City's website and made available to the public after tabling to Council.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Geoff', with a stylized flourish at the end.

Geoff Rodrigues, CPA, CA, CIA, CRMA, ORMP
Auditor General, City of Markham

REMEDIATION STATUS

#	Observations & Recommendations (from February 21, 2017 Audit Report)	Initial Rating	Remediation Overview and Further Auditor General Recommendations	Status
1	<p><u>Database Alignment with Alectra Utilities</u></p> <p>The City's database has not been updated with the customer account numbers that PowerStream assigned after implementation of their new customer information system ("CIS"). While this does not directly result in a loss of water revenue, account numbers are an essential unique identifier that provides a linkage between the property/water meter and account holder.</p> <p>Furthermore, the City has been unable to update their internal database with recent meter data from PowerStream following the implementation of their new CIS; resulting in delays for ILI calculation and Meter Lag Analysis. The City can access this data through PowerStream's Customer Care and Billing System; however, this is manual and time consuming.</p> <p><u>Recommendation</u></p> <p>A validation exercise should be performed to ensure that all database tables match Alectra Utilities' tables.</p> <p><i>Management Timeline: Q2 2017</i></p>	M	<p>The City now receives, on a monthly basis, an upload directly from Alectra Utilities of customer data, including customer account numbers and meter data, into the City's database. Upon receiving the upload, the City prepares dashboards for review and validates the accounts to ensure that the City's and Alectra Utilities' databases are aligned, and all required data is provided.</p> <p>These monthly processes and procedures have been documented into the City's standard operating procedures documents.</p> <p><u>Further Auditor General Recommendations</u></p> <p>None.</p>	Complete
2	<p><u>Automate, Extract, Transfer and Load ("ETL") Processes</u></p> <p>The current processes for extracting, transferring, and loading data from PowerStream's database to the City's require manual intervention, which can be time consuming and prone to human error.</p> <p><u>Recommendation</u></p> <p>Automating processes for extracting, transferring and loading data (e.g. web services or ETL software), could facilitate the accurate and timely transfer of data.</p> <p><i>Management Timeline: Q4 2017</i></p>	L	<p>The City, Alectra Utilities and Neptune Technology Group are working together to develop and test ETL processes including the implementation of an automated, timely and secured data transfer process. The project is targeted for completion in Q4 2019.</p> <p><u>Further Auditor General Recommendations</u></p> <p>None.</p>	Complete

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3	<p><u>Enhanced Controls around Advanced Metering Infrastructure (“AMI”) Roll-Out</u></p> <p>The City has been ensuring that all new water meters are compatible with the AMI, which is an infrastructure allowing meters to communicate with one another and the utility’s meter database.</p> <p>The AMI will improve the timeliness and accuracy of meter data, providing quicker identification of stopped meters, and reduce the amount of time required in responding to high water complaints and leak detection. However, implementing the AMI introduces inherent risks during the development phase, such as missed or inaccurate meter readings.</p> <p><u>Recommendations</u></p> <p>In order to effectively manage the inherent risks associated with the potential AMI rollout, we recommend the following:</p> <ul style="list-style-type: none">a) A phased approach to assess the functionality of communication infrastructure before proceeding to subsequent phases;b) A user acceptance testing (“UAT”) period where manual readings are used to verify accuracy of data communicated over the AMI;c) Establish and document processes for monitoring and resolving zero reads, missed reads, and spikes in consumption, including dashboard reports and alerts;d) Documenting communication and data processing issues and resolutions as they occur to facilitate quicker identification and resolution of issues; and,e) Customer education campaigns should be augmented with information about the AMI rollout. <p>Finally, internal controls should be in place to ensure that there is adequate monitoring over multiple estimated reads and consecutive zero reads.</p> <p><i>Management Timeline: Q4 2017</i></p>	L	<p>The City has determined to not move forward with the roll-out of AMI due to the high costs associated with it.</p> <p>However, recognizing the importance of having documented procedures and processes, the City has developed Standard Operating Procedures for monitoring and resolving zero reads, estimated read checking, high consumption reads and defective/broken water meter repair/replacement.</p> <p><u>Further Auditor General Recommendations</u></p> <p>None.</p>	Complete

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4	<p><u>Data Timeliness, Accuracy and Granularity</u></p> <p>The City is evaluating the business case for implementing District Metered Areas (“DMA”), with the objective of improving the geographic granularity of water volume reconciliations to facilitate the proactive identification and mitigation of physical infrastructure water leakage. DMA implementation will, along with improved ETL processes and AMI implementation, provide the City with more timely, accurate, and granular water volume data. Infrastructure leakage index (“ILI”) calculations and meter lag analysis are currently performed annually.</p> <p><u>Recommendations</u></p> <p>Implementation of DMA would improve the City’s ability to detect and resolve issues causing water volume imbalances. The City should weigh these benefits against the cost of implementation.</p> <p>Furthermore, DMA in tandem with AMI implementation would enable the City to perform ILI calculations and meter lag analysis on a rolling-twelve-month basis. DMA could also provide certain asset management benefits (however, the extent of these benefits was not assessed due to this aspect of DMA being outside the scope of this audit).</p> <p>Utilizing web services or ETL software (Observation #2), and AMI (Observation #3) to provide dashboard reporting on water volume reconciliation data, ILI trends, date since last meter reading, consecutive zero reads, and other important metrics, would enable more proactive monitoring of water volume.</p> <p><i>Management Timeline: Q4 2017</i></p>	L	<p>City staff presented and received approval from the Executive Leadership Team in September 2017 for a DMA pilot project to gather data, conduct a cost/benefit analysis and perform testing in one area. The pilot project has targeted completion of design work in 2018, with construction and data gathering in 2019.</p> <p><u>Further Auditor General Recommendations</u></p> <p>None.</p>	Complete
5	<p><u>Process Documentation</u></p> <p>The following processes related to water revenue collection are not documented:</p> <ul style="list-style-type: none"> • Monthly financial reporting and purchase and sale reconciliation; • Meter lag analysis; • American Water Works Association (“AWWA”) ILI calculation; • Information Management Systems (“IMS”), such as extracting data from Alectra Utilities, transferring data to the City, uploading data to the City’s database, and generating reports; 	L	<p>The City has prepared detailed procedures and process documentation, including the roles and responsibilities of tasks and the key controls, for the areas identified.</p> <p><u>Further Auditor General Recommendations</u></p> <p>None.</p>	Complete

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	<ul style="list-style-type: none"> Adjustments made by Alectra Utilities; and, Residential Occupancy Monitoring. <p>The City has implemented a quality management system ("QMS") based on ISO 9001 principles, albeit not officially certified. This provides a structured framework for the City to conduct a consistent evaluation and update of documents governing key controls.</p> <p>Recommendations</p> <p>All processes should be documented to a standard similar to the Drinking Water QMS and in sufficient detail to facilitate staff training and provide guidance over standard operating procedures ("SOP") including swim lanes to outline roles and responsibilities around key tasks.</p> <p>The documentation should reflect the key controls in place to ensure the effective operation of the process, especially in the event of staff attrition (i.e. departures or absences).</p> <p>As a best practice, process documentation should be reviewed and updated on a periodic basis (at least annually) by City staff and the executive leadership team, in order to ensure continued accuracy, relevance and completeness of procedures performed by City staff.</p> <p>Management Timeline: Q4 2017</p>			
6	<p><u>Third Party Vendor Risk Management</u></p> <p>PowerStream is contracted by the City for meter reading (which is further subcontracted to Olameter), billing, collections, and front-line customer service operations. Since PowerStream remits payments to the City equal to the amount of revenue billed (less adjustments, arrears, and PowerStream's fee), much of the responsibility for billing and collections resides with PowerStream. While the City maintains processes to verify the remittance amount, there remains an inherent risk relating to the accuracy and completeness of information provided to the City by PowerStream.</p> <p>The Shared Services Agreement ("SSA") between the City and PowerStream contains a clause allowing the City to establish, incorporate and maintain operating procedures to satisfy the City's requirements for accuracy and auditing. However, the SSA does not provide "right to audit" or "service audit" clauses related to the internal controls at PowerStream.</p>	L	<p>The City has made Alectra Utilities aware that the "right to audit" or "service audit" clause will be included in an amendment to the SSA. The amendment is targeted for June 2018.</p> <p><u>Further Auditor General Recommendations</u></p> <p>None.</p>	Complete

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	<p><u>Recommendations</u></p> <p>To ensure the internal controls at Alectra Utilities are designed and operating effectively with respect to the billing, collection and remittance of water revenue to the City, consideration should be given to including a “right to audit” and/or “service audit” clause in future SSAs that would allow the City to either conduct independent evaluations of the internal controls at Alectra Utilities or require Alectra Utilities to provide the City with an independent audit report (i.e. service audit report) in accordance with the Canadian Standards on Assurance Engagements (“CSAE”) 3416.</p> <p><i>Management Timeline: upon contract expiry of December 31, 2018</i></p>			
7	<p><u>Merger Integration Controls</u></p> <p>As of February 1, 2017, PowerStream has merged with two other utilities (Enersource and Horizon) to form Alectra Utilities, which will acquire Hydro One Brampton on February 28, 2017.</p> <p>The merging utilities will be required to utilize one CIS, which could increase the inherent risk for missed or inaccurate bills or data integrity issues around customer information. For example, PowerStream had not been able to provide the City with data for performing their meter lag analysis and ILI Water Index procedures for 2015 as a result of their transition to a new CIS, which demonstrates the heightened inherent risk around not being able to access data in an acceptable format.</p> <p><u>Recommendations</u></p> <p>While planning for transition of the meter reading, billing, and collection function to Alectra Utilities, the City must ensure adequate controls are in place to minimize potential for missed or inaccurate bills or data accessibility and integrity. These could include:</p> <ul style="list-style-type: none"> • Importing meter data to the City’s database directly from AMI; • Active role in planning of CIS integration to minimize the impact on water billing; • Meter data web-services for more timely exchange of data between the City and the service provider (see Observation #4); • Additional monitoring and proactive resolution of meter reading exceptions after the CIS integration; and, • Regular updates from Alectra Utilities on progress with merger 	L	<p>Further to the remediation overview of Observations #1 and #2 above, the City has been working with Alectra Utilities to ensure that the City’s and Alectra Utilities’ CIS databases are aligned, all required data is provided to the City for monitoring, and processes and procedures are documented into the City’s standard operating procedures documents.</p> <p>The City and Alectra have also established quarterly meeting updates where merger integration, ongoing projects and service improvement opportunities are discussed.</p> <p><u>Further Auditor General Recommendations</u></p> <p>None.</p>	Complete

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	<p>integration activities that impact the City and services rendered.</p> <p>Management Timeline: Q4 2017</p>			
8	<p><u>Workflow Automation</u></p> <p>The City's metering services provider has implemented an electronic work order system. Currently, the communication of meter installations or replacements between the City and PowerStream involves a number of time-consuming manual steps that increase the potential for meter serial number and customer information inaccuracies.</p> <p><u>Recommendation</u></p> <p>Continuing to work with Alectra Utilities on investigating options to leverage Neptune's automated work order system could streamline meter installation and testing processes.</p> <p>Management Timeline: Q2 2017</p>	L	<p>In conjunction with Observation #2 above, the City, Alectra Utilities and Neptune Technology Group are working together to develop and test ETL processes including work order data transfer processes. The project is targeted for completion in Q4 2019.</p> <p><u>Further Auditor General Recommendations</u></p> <p>None.</p>	Complete
9	<p><u>Resource Model</u></p> <p>As the City's Environmental Services evolves, and with the implementation of the above recommendations, additional skills and experience may be required to implement and leverage increasingly sophisticated information systems.</p> <p><u>Recommendation</u></p> <p>The City should regularly assess whether staff have the necessary training, expertise, and experience to implement new technologies and supporting processes to ensure any gaps are filled in a timely manner.</p> <p>Management Timeline: Ongoing</p>	L	<p>For Waterworks Operators, both legislated and organizational training is tracked to ensure staff have attended the required courses to maintain/obtain their licences.</p> <p>For other Waterworks staff, training and skills development is tailored to meet professional and personal developmental goals.</p> <p><u>Further Auditor General Recommendations</u></p> <p>None.</p>	Complete

RECOMMENDATION

The Auditor General recommends that:

1. The Water Revenue Audit - Follow Up Report be received.



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