



Halifax Regional Municipality Specified Procedures Report

2019 Special Election - Lower Sackville, District 15

October 24, 2019



Dieppe
11 Englehart Street
Dieppe, NB E1A 7Y7
Tel: +1 506 853 3097
Fax: +1 506 859 7190

Fredericton
527 Queen Street
Suite 110
Fredericton, NB E3B 3T2
Tel: +1 506 455 8181
Fax: +1 506 455 8141

Halifax
RBC Waterside Centre
1871 Hollis Street
Suite 500
Halifax, NS B3J 0C3
Tel: +1 902 420 1080
Fax: +1 902 420 0503

Saint John
Red Rose Tea Building
5th floor
12 Smythe Street
Saint John, NB E2L 5G5
Tel: +1 506 634 7000
Fax: +1 506 634 2129

St. John's
Fortis Place
5 Springdale Street
Suite 800
St. John's, NL A1E 0E4
Tel: +1 709 726 2840
Fax: +1 709 726 0345

Ernst & Young LLP
Atlantic Canada
ey.com

Report on results of applying Specified Procedures on the electronic voting system used during the polling period for the Halifax Regional Municipality 2019 Special Election for Lower Sackville, District 15

To the Returning Officer of Halifax Regional Municipality

As specifically agreed, Ernst & Young LLP (“we” or “EY”) have performed the procedures detailed in Appendix A (the “Specified Procedures”) in connection with the electronic voting system used during the polling period (between 12:00 p.m. on September 28, 2019 and 7:00 p.m. on October 5, 2019) for the Halifax Regional Municipality (“HRM”) 2019 Special Election for Lower Sackville, District 15.

The results of applying the Specified Procedures are set out in Appendix A. The Specified Procedures performed do not constitute an audit or review engagement and, accordingly, no assurance is expressed. Had we performed additional procedures, an audit or review engagement, other matters might have come to light that would have been reported. The sufficiency and appropriateness of the Specified Procedures described in this report are solely the responsibility of the Returning Officer. Consequently, we make no representation regarding questions of legal interpretation or regarding the sufficiency and adequacy of the Specified Procedures described in Appendix A, either for the purpose for which this report has been requested, or for any other purposes.

This report is intended solely for the purpose of assisting the Returning Officer in evaluating the electronic voting system used in the HRM 2019 Special Election for Lower Sackville, District 15 during the polling period. Any use that a third party makes of our report, and any reliance or decisions made based on it, are the responsibility of such third party. We accept no responsibility for any loss or damages suffered by any third party as a result of decisions made or actions taken based on our report.

Chartered Professional Accountants
St. John's, Canada
October 24, 2019

Note - This report is confidential and is intended solely for the use of the Returning Officer, Halifax Regional Municipality. Our report has not considered issues relevant to third parties and we shall have no responsibility whatsoever to any third party which obtains a copy of this report. Any use such a third party may choose to make of this report is entirely at its own risk. EY consents to HRM posting a PDF copy of this final Specified Procedures report in its entirety and unmodified format on HRM's publicly-accessible website.

Overview

Background

The Halifax Regional Municipality (“HRM”) engaged a third party, ScytI Secure Electronic Voting (“ScytI” or the “software service provider”), to support the electronic voting process during the polling period of the 2019 Special Election for Lower Sackville, District 15. ScytI’s Invote application is the electronic voting system that was utilized. EY was engaged by HRM to perform Specified Procedures before, during and after the electronic voting portion of the polling period.

Electronic voting was available during the polling period (between 12:00 p.m. on September 28, 2019 and 7:00 p.m. on October 5, 2019).

Definition of terms used in this report

For ease of reading, certain terms, acronyms and abbreviations are used within the body of the report. These are explained below:

- ▶ **.csv (Comma Separated Values)** - format of the files obtained for the performance of the Specified Procedures.
- ▶ **Active** - a state of the electronic voting system where the system is active and actual electronic voting is performed. Audit votes cast via Internet and IVR systems during the polling period were cast at this state of the electronic voting system.
- ▶ **Audit PIN/PINs** - PINs that were generated using the electronic voting system’s Auditor Module, which were separately identified and segregated from the Voter PINs and used to perform the Specified Procedures.
- ▶ **Audit votes** - votes that were generated and segregated from the electronic voting system so that they can be monitored and used to perform the Specified Procedures.
- ▶ **Audit Ballot Box** - A module in the electronic voting system that is used to cast audit votes before, during and after the polling period. The Participation Report and Tally Results Report specific to the votes cast in the Audit Ballot Box can also be generated from this module.
- ▶ **Acclaimed candidate** - A candidate who is declared the councilor because no one chose to run against the candidate.
- ▶ **Election Ballot Box** - A module in the electronic voting system that contains the votes of the electors. This module is used to count elector votes during the polling period. The Participation Report and Tally Results Report specific to the votes cast in the Election Ballot Box can also be generated from this module.
- ▶ **Elector Data** - Relevant information about the electors within District 15. This includes their first name, last name, birth date, address, age, division etc.
- ▶ **Electronic voting** - voting via telephone or via computer.

- ▶ **Internet system** - a component of the electronic voting system used to support computer-based voting through the www.hrm.secured.vote website. Audit votes were cast during the polling period using audit PINs within this system.
- ▶ **Invite** - Invite is a **secure online voting solution that** was utilized for the Halifax Regional Municipality (“HRM”) 2019 Special Election for Lower Sackville, District 15. Invite is referred to as the “electronic voting system” throughout the body of this report.
- ▶ **IVR (Interactive Voice Response) system** - a component of the electronic voting system used to support telephone-based voting through the 1-833-694-8206 toll free number. Audit PINs were used in this system to cast audit votes during the polling period.
- ▶ **Non-acclaimed candidate** - Candidates who are running for councilor in the Halifax Regional Municipality (“HRM”) 2019 Special Election for Lower Sackville, District 15.
- ▶ **Participation Report** - Report, in Invite, which contains the number of electronic votes cast, by Internet and IVR. The report details the number of votes cast by Division. This report was generated just before the start of the polling period to validate that no votes were recorded.
- ▶ **PIN/PINs (Personal Identification Number)** - this number, along with the date of birth, is used to login and vote in the electronic voting system.
- ▶ **PIN Summary Page** - The PIN Summary Page, in Invite, consists of summarized statistics of the status of the credentials (PINs). This report shows the same information by Election Ballot Box or Audit Ballot Box.
- ▶ **Tally Results Report** - Report, in Invite, which contains the election results. The report details the number of votes cast by Division for each candidate. The report also details the aggregate votes cast for each candidate. This report was generated just at the end of the polling period to reveal the election results.
- ▶ **.txt (Text)** - format of the files obtained for the performance of the Specified Procedures.
- ▶ **Voter View** - the electronic system used to store elector data by the Halifax Regional Municipality. This is a separate application from Invite.

Data files used in executing the Specified Procedures

HRM and ScytI provided the following data files from their information systems to support certain Specified Procedures.

Organization	File name	File contents	As referenced in the Appendix A Specified Procedures
HRM	VoterView_Extract_2019-Sep-27.xls	The HRM voter information recorded in the HRM Voter View system.	Elector data extract HRM data extract
	2019CandidateList.pdf	List of candidates from https://www.halifax.ca/city-hall/elections/official-candidates-special-election-district-15	Listing of all acclaimed and non-acclaimed candidates
ScytI	Halifax_9905_p_20190910_0.txt	The elector data extract from Voter View that was used to load the PINs into the electronic voting system.	Software service provider data extract
	Audit Ballot Box: 40284e116d249a71016d452b8aef46fa-electionEventData.csv Election Ballot Box: 40284e116d249a71016d2b33d9e0004b-electionEventData (1).csv	Files that show the configuration of the Audit Ballot Box and Election Ballot Box, used to validate that the configurations are the same.	Configuration files

We relied on HRM and ScytI to provide us with complete, accurate and reliable data files, as described above, on which we performed the Specified Procedures. For any information that was not provided by HRM and ScytI, we were given Auditor access to Invote and were able to extract this information directly from the Invote application. We did not verify the completeness, accuracy or integrity of this data against any independent source other than as described in the Specified Procedures.

Appendix A - Specified Procedures on the electronic voting system used during the polling period for the HRM 2019 Special Election for Lower Sackville, District 15 and the results of the Specified Procedures

Step #	Specified Procedures	Results	Timing and occurrence of Specified Procedures ¹		
			Before	During	After
1	<p>Obtain the elector data extract from Voter View from Halifax Regional Municipality. Obtain the PIN Summary Page from the electronic voting system from Scytl.</p> <p>Sub-procedure A - Compare the total number of records for all records in the two data extracts.</p> <p>Sub-Procedure B - Inquire with the Halifax Regional Municipality Returning Officer as to the reason for any discrepancies.</p>	<p>Sub-Procedure A - The total number of records in the elector data extract was 16,504 and the total number of records in the software service provider PIN Summary Page data extract was 16,497.</p> <p>Sub-Procedure B - There was a discrepancy of seven (7) between the Voter View extract and what was loaded into Invote. The variance was due to voters identified as no longer living in the District and, therefore, not eligible to vote, as well as deceased voters. Discrepancies were validated for appropriateness with Kevin Arjoon, Returning Officer, District 15 Special Election.</p>	X		

¹ Note - Electronic voting was available between 12:00 p.m. September 28, 2019 and 7:00 p.m. October 5, 2019. The "Before" period is defined as the period between September 1, 2019 and the start of the electronic advanced voting period. The "During" period is defined as the period where electronic voting was available. The "After" period is defined as the period between the end of the electronic advanced voting period and October 18, 2019. The Specified Procedures were carried out at various times during these periods, as indicated in the Results tables and the results apply only to the particular time(s) indicated.

Step #	Specified Procedures	Results	Timing and occurrence of Specified Procedures ¹		
			Before	During	After
2	<p>Examine the PIN Summary Page in the electronic voting system.</p> <p>Perform a recalculation of the number of total valid PINs. The number of total valid PINs is the number of total PINs assigned to voters. Total valid PINs = PINs Assigned + PINs Enumerated - PINs Disabled.</p> <p>Validate that there have no PINs that have been disabled, as disabled PINs would be an indicator of a manual voter or deleted voter. If there are disabled PINs, perform inquiry and obtain evidence to substantiate the rationale for the disabled PIN (for example, the voter may have been deleted, as the voter is deceased).</p>	<p>Recalculation of the number of total valid PINs was performed successfully.</p> <p>Total valid PINs (16,502) = PINs Assigned (16,497) + PINs Enumerated (12) - PINs Disabled (7).</p> <p>Seven (7) disabled PINs were identified in the recalculation performed. The variance was due to voters identified as no longer living in the District and, therefore, not eligible to vote, as well as deceased voters. Discrepancies were validated for appropriateness with Kevin Arjoon, Returning Officer, District 15 Special Election.</p>	X		
3	<p>Obtain a listing of all system users who can access the electronic voting system (application and database).</p> <p>Obtain representation from the Returning Officer, District 15 Special Election (application layer) and software service provider System Representative (database layer) that those listed users are appropriate.</p>	<p>Representations from the HRM Returning Officer, District 15 Special Election and ScytI System Representative indicated that all listed system users of the electronic voting system (application and database) were appropriate.</p>	X		

Step #	Specified Procedures	Results	Timing and occurrence of Specified Procedures ¹		
			Before	During	After
4	<p>Obtain a listing of all non-acclaimed candidates and their districts from the municipality. Using Auditor PINs:</p> <p>Sub-procedure A - Visually inspect that all candidate names are set up in the Internet system and are assigned to the correct district.</p> <p>Sub-procedure B - Listen and validate that the candidate names are audible/set up in the IVR system and are assigned to the correct district.</p>	<p>Sub-Procedure A - All non-acclaimed candidate names were set up and assigned to the correct district in the Internet system.</p> <p>Sub-Procedure B - All non-acclaimed candidate names were audible/set up and assigned to the correct district in the IVR system.</p>	X		
5	<p>Attempt to log on to the electronic voting system via telephone to attempt to cast votes prior to the polling period.</p>	<p>Attempted to log onto the electronic voting system via telephone (1-833-694-8206) and noted that access was denied for the following time:</p> <p>▶ Friday September 27, 2019 at 3:32PM</p>	X		
6	<p>Attempt to log on to the electronic voting system via Internet to attempt to cast votes prior to the polling period.</p>	<p>Attempted to log onto the electronic voting system via Internet (https://hrm.secured.vote) and noted that access was denied at the following time:</p> <p>▶ Friday September 27, 2019 at 3:15PM</p>	X		

Step #	Specified Procedures	Results	Timing and occurrence of Specified Procedures ¹		
			Before	During	After
7	<p>Attempt to log on to the electronic voting system via Internet to attempt to cast a vote with a PIN that has been "disabled".</p> <p>Attempt to log on to the electronic voting system via telephone to attempt to cast votes with a PIN that has been "disabled".</p>	<p>Access to the electronic voting system via Internet and telephone using a PIN that was "disabled" was denied.</p>	X	X	
8	<p>Validate the results match those that were expected from the pre-defined voting selections for the population of voters.</p> <p>Validate that the cast blank ballots did not enter into the election results as valid votes but as spoiled ballots.</p> <p>View the details of each ballot using the Auditor Module to verify the vote was counted as cast.</p> <p>Obtain screenshots of configuration of the Election Ballot Box and Audit Ballot Box. Confirm that the configuration of both Ballot Boxes is consistent with one another, in the production environment.</p>	<p>Audit voting election results match those that were expected from the pre-defined voting selections for the population of audit votes. Blank ballots were not accepted and did not enter into the election results.</p> <p>Before voting, 26 audit votes were cast, and 26 audit votes were counted as cast.</p> <p>During voting, 25 audit votes were cast, and 25 votes were counted as cast.</p> <p>The configuration of the Audit Ballot Box and Election Ballot Box were consistent, with the exception of the date of opening and closing of the Ballot Boxes and the process to Tally Results. The opening and closing of the Election Ballot Box was September 28, 2019 at 15:00:00 UTC (12:00:00 ADT) to October 5, 2019 at 23:00:00 UTC (20:00:00 ADT). The opening and closing of the Audit Ballot Box was August 18, 2019 at 15:16:00 UTC (12:16:00</p>	X	X	

Step #	Specified Procedures	Results	Timing and occurrence of Specified Procedures ¹		
			Before	During	After
		ADT) to September 29, 2019 at 15:16:00 UTC (12:16:00 ADT). The Election Ballot Box was only open for the duration of the polling period. The Auditor Ballot Box was open prior to the polling period and at the beginning of the polling period. The Election Ballot Box requires an Electoral Board, whereas the Audit Ballot Box does not.			
9-1	Using an Auditor PIN that has already been used to cast a vote, observe whether additional votes can be cast and recorded in the electronic voting system with the same Auditor PIN. Sub-procedure A - Attempt to log on and vote for the same candidate as the first vote. Sub-procedure B - Attempt to vote for a different candidate than the first vote.	Access to the electronic voting system via IVR and Internet using an Auditor PIN that was already used was denied.	X	X	
9-2	Using a computer that was already used to cast a complete electronic voting session, conduct additional complete electronic voting sessions from the same computer. Observe whether the Internet system will record the electronic votes from three (3) unique Auditor PINs using the same device.	Three (3) unique votes were cast with the same device, using unused Auditor PIN credentials.	X	X	

Step #	Specified Procedures	Results	Timing and occurrence of Specified Procedures ¹		
			Before	During	After
9-3	<p>Using an Auditor PIN, complete an electronic voting session by voting using the IVR system. Using the same Auditor PIN, attempt to use the Internet system to conduct an additional complete electronic voting session by voting for the same candidate as voted for using the IVR system.</p> <p>Observe whether additional votes can be cast for the candidate.</p>	An Auditor PIN was used to complete an electronic voting session in the electronic voting system via IVR. A vote was cast. This same Auditor PIN could not be used to cast a second vote in the electronic voting system via Internet.	X	X	
9-4	<p>Begin an Internet voting session, using an Auditor PIN, cast a vote and obtain confirmation of that vote.</p> <p>Disconnect from the system (disconnect access).</p> <p>Log back on to the system using the same credentials and observe whether the PIN is able to vote.</p>	An Auditor PIN was used to complete an electronic voting session in the electronic voting system via Internet. A vote was cast. This same Auditor PIN was used to log back into the electronic voting system via Internet. The same Auditor PIN could not cast a second vote.	X	X	

Step #	Specified Procedures	Results	Timing and occurrence of Specified Procedures ¹		
			Before	During	After
9-5	<p>Begin a voting session (Internet or IVR).</p> <p>Keep the session active.</p> <p>Using a different physical computer or IVR, attempt to log on to the system using the same set of credentials and observe whether the system will allow the log on.</p> <p>If allowed, attempt to cast a vote in each session.</p> <p>Observe whether only one vote has been counted.</p>	<p>An Auditor PIN was used to complete an electronic voting session in the electronic voting system via Internet. A vote was cast. The same Auditor PIN was used to log into the electronic voting system via the Internet, using a second device. The same Auditor PIN could not cast a second vote.</p> <p>An Auditor PIN was used to complete an electronic voting session in the electronic voting system via IVR. A vote was cast. The same Auditor PIN was used to log into the electronic voting system via IVR, using a second device. The same Auditor PIN could not cast a second vote.</p> <p>An Auditor PIN was used to complete an electronic voting session in the electronic voting system via IVR. A vote was cast. The same Auditor PIN was used to log into the electronic voting system via the Internet, using a second device. The same Auditor PIN could not cast a second vote.</p>	X	X	

Step #	Specified Procedures	Results	Timing and occurrence of Specified Procedures ¹		
			Before	During	After
10	<p>Obtain the pre-election Participation Report from the software service provider's information system and observe whether there are any votes recorded.</p> <p>The timing of this procedure is to occur within five minutes prior to the polling period start time.</p>	No votes were recorded in the Participation Report prior to the polling period start time. The Participation Report was run in the Auditor Module on September 28, 2019 at 11:55AM.	X		
11	Attempt to log on to the IVR system to attempt to cast votes after the electronic polling period has ended.	Attempted to log onto the electronic voting system via IVR system on October 5, 2019 at 7:04PM and noted a message indicating, "This election is closed. Goodbye."			X
12	Attempt to log on to the Internet system to attempt to cast votes after the electronic polling period has ended.	Attempted to log onto the electronic voting system via Internet system on October 5, 2019 at 7:01PM and noted a message indicating, "The election is closed."			X
13	<p>Election Close (October 5, 2019, 7pm):</p> <p>The Tally Process will be initiated by the Electoral Board. The Electoral Board will utilize their private keys in order to enable the Tally Process to begin. The Tally Process requires a minimum threshold of Electoral Board members to be present and to utilize their private key. Once the Tally Process has finished, the results of the election event are contained within the electronic voting system. The Returning Officer will print out the Tally Results Report which details the election results.</p>	The Tally Process was initiated by the Electoral Board on October 5, 2019 at 7PM. Four (4) of five (5) of the Electoral Board members were present, which met the minimal threshold. The Tally Process was completed at 7:11PM on October 5, 2019. The Tally Results were provided to the Returning Officer who printed out the election results.			X

Step #	Specified Procedures	Results	Timing and occurrence of Specified Procedures ¹		
			Before	During	After
14	<p>After Election Close (October 5, 2019, 7pm onwards):</p> <p>After the close of the election, the Auditor, will print off the election results (Tally Results Report) using their ID and compare the electronic voting results with the electronic voting results from the Returning Officer's report printed through the Tally Process. The vote counts, in both Tally Results Reports, should be equal, demonstrating no additional votes were added to the system since the voting period ended.</p>	<p>Using the Auditor module, generated and printed the Participation Report using the Auditor's ID October 5, 2019 at 7:07 PM. The Returning Officer printed the Tally Results. Compared the electronic voting results from the Tally Results report with the Participation Report. Vote counts were equal, demonstrating no additional votes were added since the voting period ended.</p>			X

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