

Post-Election Audit Summary

September 10, 2013 Primary Election

Cleveland Council Ward 9

October 1, 2013 Primary Election

East Cleveland Mayor

November 5, 2013 General Election

North Olmsted Mayor

November 5, 2013 General Election

Issue 4 - Cuyahoga Co. Charter Amend. III.3.10.5

On December 9th and 10th, 2013 we conducted Risk-Limiting Post-Election Audits for one contest in the September 10, 2013 Primary Election (Cleveland Council Ward 9), one contest in the October 1, 2013 Primary Election (East Cleveland Mayor), and two contests in the November 5, 2013 General Election (North Olmsted Mayor and Issue 4). A total of 66 batches were audited, which amounted to a hand count of 9,538 ballots.

Our Risk-Limiting Audits were based upon the Kaplan-Markov method as explained by Philip B. Stark and Mark Lindeman. Auditing best practices recommend we split up the total ballots cast by precinct into multiple batch types. We utilized five batch types each consisting of one single ballot type category: Absentee, Election Day, Provisional, Post Absentee, and Post Election Day.

A master spreadsheet was created for each contest with statistical formulas to determine the number of batches that must be audited in order to reach a 90% confidence level. This confidence level means the audit has at least a 90% probability of leading to a full recount if the apparent outcome is incorrect.

We used a "Probability Proportional to Error Bound with Replacement" selection method and assigned ranges of numbers for each batch within the contests. Unique ranges of numbers were allocated to specific batches based upon their error bound - i.e. the greater the possibility of a miscount within a batch, the more numbers assigned, and the more likely it is to be selected. To obtain the precinct batch number we rolled differently colored dice numbered 0 - 9, each one of the colored die representing one digit of the batch number. Overall, we rolled the dice a total of 66 times in order to randomly select batches to audit.

In conclusion, we inspected a total of 9,538 ballots from the audited contests. There were no discrepancies for any of the audited contests giving us a 100% accuracy rate for the September 10, 2013 Primary, October 1, 2013 Primary, and November 5, 2013 General Election Post-Election Audits.

Audit Information by Contest

Contest	Total Ballot Audited	Total Ballot Cast	Number of Batches Audited	Number of Precincts in Contest
September 10, 2013 Primary Election - Cleveland Council Ward 9	127	1,027	4	24
October 1, 2013 Primary Election - East Cleveland Mayor	688	2,169	8	18
November 5, 2013 General Election - North Olmsted Mayor	1,126	8,216	6	24
November 5, 2013 General Election - Issue 4 - Cuyahoga Co. Charter Amend. III.3.10.5	7,597	262,262	48	1,047

Cost Information by Contest

Contest	Total Cost	Cost per Ballot Audited Contest Only	Cost per Ballot Entire Election	Cost per Batch Audited Contest Only
September 10, 2013 Primary Election - Cleveland Council Ward 9	\$161.96	\$0.16	\$0.01	\$40.49
October 1, 2013 Primary Election - East Cleveland Mayor	\$161.96	\$0.07	\$0.07	\$20.25
November 5, 2013 General Election - North Olmsted Mayor	\$323.92	\$0.04	\$0.001	\$53.99
November 5, 2013 General Election - Issue 4 - Cuyahoga Co., Charter Amend. III.3.10.5	\$1,457.65	\$0.01	\$0.01	\$30.37
Total	\$2,105.49			

Historical Post-Election Audit Accuracy Rate

