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# Post-Election Audit Summary

## March 6, 2012 Primary Election (Republican Presidential Delegate At Large, Democratic Justice of the Supreme Court FTC 1/2/13 and County Issue 15)

On April 16<sup>th</sup> and 17<sup>th</sup>, 2012 we conducted three Risk-Limiting Post-Election Audits for the March Primary Election. A total of 86,727 ballots were cast for the Republican Presidential Delegate-At-Large between six (6) candidates, 144,287 ballots were cast for the Democratic Justice of the Supreme Court FTC 1/2/13 between two (2) candidates and a total of 244,439 ballots were cast for County Issue 15.

Our Risk-Limiting Audit was 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. Our first precinct batch type consisted of the Absentee ballot category. Our second precinct batch type was made up of the ballots cast in the Election Day, Provisional, Post-Election Day and Post-Absentee categories.

A master spreadsheet was created 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 utilizing five (5) colored die. We assigned five (5) digit numbers ranging from 00000 through 99,999 for all three races. 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 five (5) colored die, each one of the colored die representing one (1) digit of the five (5) digit number. We rolled the die a total of thirty-nine (39) times, selecting batches for all three (3) races.

RACE	TOTAL BALLOTS CAST	REQUIRED PRECINCT BATCHES SELECTED	TOTAL BALLOTS AUDITED	COST
Presidential Delegates-At-Large (REP)	86,727	14	1,478	\$483.23
Supreme Court Justice, FTC 1/2/13 (DEM)	144,287	17	1,364	\$713.95
County Issue 15	244,439	8	1,259	\$483.23

In conclusion, we audited a total of 4,101 ballots from three races in the March 6, 2012 Primary Election. All results match the Amended Official Certification giving us a 100% audit accuracy rate for the election.



**Cost Breakdown**

<b>Audit Totals</b>	
<b>Total Cost of Post-Election Audit (all Races)</b>	<b>\$1,680.41</b>
<b>Cost Per Ballot</b>	<b>\$0.004</b>
<b>Cost Per Precinct (Ballots Cast in Audited Contest Only)</b>	<b>\$43.087</b>

<b>Supreme Court Justice FTC 1-2-2013 (DEM)</b>	
<b>Total Cost of Post-Election Audit</b>	<b>\$713.95</b>
<b>Cost Per Ballot (Ballots Cast in Audited Contest Only)</b>	<b>\$0.005</b>
<b>Cost Per Ballot (Ballots Cast in Entire Election)</b>	<b>\$0.003</b>
<b>Cost Per Precinct (Ballots Cast in Audited Contest Only)</b>	<b>\$50.996</b>

<b>Presidential Delegates-at-Large and Alternates-at-Large (REP)</b>	
<b>Total Cost of Post-Election Audit</b>	<b>\$483.23</b>
<b>Cost Per Ballot (Ballots Cast in Audited Contest Only)</b>	<b>\$0.006</b>
<b>Cost Per Ballot (Ballots Cast in Entire Election)</b>	<b>\$0.002</b>
<b>Cost Per Precinct (Ballots Cast in Audited Contest Only)</b>	<b>\$28.425</b>

<b>Issue #15: Cuyahoga County Health and Human Services Tax Levy</b>	
<b>Total Cost of Post-Election Audit</b>	<b>\$483.23</b>
<b>Cost Per Ballot (Ballots Cast in Audited Contest Only)</b>	<b>\$0.002</b>
<b>Cost Per Ballot (Ballots Cast in Entire Election)</b>	<b>\$0.002</b>
<b>Cost Per Precinct (Ballots Cast in Audited Contest Only)</b>	<b>\$60.404</b>

**Historical Post-Election Audit Accuracy Rate**

