Maricopa County Forensic Audit

Volume I: Executive Summary & Recommendations

Work Performed For:

Arizona State Senate
1700 W Washington St
Phoenix, AZ 85007

1 DOCUMENT OVERVIEW

This document includes the Executive Summary of the Maricopa County Forensic Audit, a listing of findings within the Findings Summary, as well as Recommendations based on our work in the audit.

For more details about the Methodology & Operations of the audit, please see "Maricopa County Forensic Audit – Volume II – Methodology and Operations".

For more details about the Findings of the report, or to review the results from the hand-tallying of the 2.1 Million ballots, please see "Maricopa County Forensic Audit – Volume III – Result Details".

2 EXECUTIVE SUMMARY

The preamble to our Constitution reminds us that our nation is always pursuing greater perfection, seeking to establish "… a more perfect Union" so that we can "...secure the Blessings of Liberty to ourselves and our Posterity". Nothing is more essential in establishing liberty than free and fair elections. To that end, Cyber Ninjas was engaged by the Arizona Senate to audit the 2020 General Election and determine in what areas legislative reform may enhance our current process so that our elections may continue to get better, becoming "more perfect". In doing so, it was our goal to restore faith in American elections by either proving the results valid or identifying areas where legislation could resolve any identified issues.

This audit has been the most comprehensive and complex election audit ever conducted. It involved the hand counting of 2.1 million ballots, a forensic paper inspection of all ballots, a forensic review of the voting machines, and an in-depth analysis of the voter rolls and the 2020 General Election final files.

What has been found is both encouraging and alarming. On the positive side there were no substantial differences between the hand count of the ballots provided and the official canvass results for the County. This is an important finding because of concerns ahead of the audit.

However, while it is encouraging for voters, it does not allay all of the concerns:

- None of the various systems related to elections had numbers that would balance and agree with each other. In some cases, these differences were significant.
- There appears to be many ballots cast from individuals who had moved prior to the election.
- Files were missing from the Election Management System (EMS) Server.
- Ballot images on the EMS were corrupt or missing.
- Logs appeared to be intentionally rolled over, and all the data in the database related to the 2020 General Election had been fully cleared.
- On the ballot side, batches were not always clearly delineated, duplicated ballots were missing the required serial numbers, originals were duplicated more than once, and the Auditors were never provided Chain-of-Custody documentation for the ballots for the time-period prior to the ballot's movement into the Auditors' care. This all increased the complexity and difficulty in properly auditing the results; and added ambiguity into the final conclusions.

Had Maricopa County chosen to cooperate with the audit, the majority of these obstacles would have easily been overcome. By the County withholding subpoena items, their unwillingness to answer questions as is normal between auditor and auditee, and in some cases actively interfering with audit research, the County prevented a complete audit.

This did not stop the primary goal of offering recommendations for legislative reform to the Arizona Senate, but it did leave many questions open as to the way and manner that the 2020 General Election was conducted. As a result, while many areas of concern were specifically identified, our full audit results validating the 2020 General Election are necessarily inconclusive.

Furthermore, there are sufficient discrepancies among the different systems that, in conjunction with some of our findings, suggest that the delta between the Presidential candidates is very close to the potential margin-of-error for the election. It is recommended that legislative reform be passed that tightens up the election process to provide additional certainty to elections going forward and that several specific findings of our audit be further reviewed by the Arizona Attorney General for a possible investigation.

3   FINDING SUMMARY

The following is a list of findings covered within the report. Details on all these findings as well as the results of the hand-tallying can be found in the document "Maricopa County Forensic Audit – Volume III – Results Details".

NOTE: Ballots Impacted is intended to give a gauge on the potential impact for the finding. While it is based on the number of ballots impacted by the finding, it is not generally expected that any single finding would completely favor a candidate. In many cases there could be legitimate and legal votes within the Ballots Impact amount. For more details, please see the write-up for the finding within Volume III.

Finding Name	Phase	Ballots Impacted	Severity
Mail-in Ballots Voted from Prior Address	Voter History	23,344	Critical
Potential Voters that Voted in Multiple Counties	Voter History	10,342	Critical
More Ballots Returned by Voter Than Received	Certified Results	9,041	High
Election Management System Database Purged	Voting Machine	N/A	High
Election Files Deleted	Voting Machine	N/A	High
Corrupt Ballot Images	Voting Machine	N/A	High
Official Results Does Not Match Who Voted	Certified Results	3,432	Medium
More Duplicates Than Original Ballots	Ballot	2,592	Medium
In-Person Voters Who Had Moved out of Maricopa County	Certified Results	2,382	Medium
Voters Moved Out-of-State During 29-Day Period Proceeding Election	Voter History	2,081	Medium
Missing Ballot Images	Voting Machine	N/A	Medium
Failure to Follow Basic Cyber Security Practices	Voting Machine	N/A	Medium
Subpoenaed Equipment Not Provided	Voting Machine	N/A	Medium
Anonymous Logins	Voting Machine	N/A	Medium
Dual Boot System Discovered	Voting Machine	N/A	Medium
EMS Operating System Logs Not Preserved	Voting Machine	N/A	Medium
Votes Counted in Excess of Voters Who Voted	Certified results	836	Low
Voters not part of the Official Precinct Register	Voter History	618	Low
Ballots Returned Not in the Final Voted File	Certified Results	527	Low
Duplicated Ballots Incorrect & Missing Serial Numbers	Ballot	500	Low
Mail-In Ballot Received without Record of Being Sent	Certified Results	397	Low

Voters With Incomplete Names	Voter History	393	Low
Deceased Voters	Voter History	282	Low
Audit UOCAVA Count Does Not Match the EAC Count	Ballots	226	Low
Late Registered Voters with Counted Votes	Voter History	198	Low
Date of Registration Changes to Earlier Date	Voter History	194	Low
Duplicate Voter IDs	Voter History	186	Low
Multiple Voters Linked by AFFSEQ	Voter History	101	Low
Double Scanned & Counted Ballots	Ballot	50	Low
UOCAVA Electronic Ballots Double Counted	Ballot	6	Low
Duplicate Ballots Reuse Serial Numbers	Ballot	6	Low
EMS Operating System Logs Not Preserved	Voter History	N/A	Low
Election Data Found from Other States	Voter History	N/A	Low
Audit Interference	Ballot	N/A	Informational
Batch Discrepancies	Ballot	N/A	Informational
Commingled Damaged and Original Ballots	Ballot	N/A	Informational
Early Votes Not Accounted for In EV33	Certified Results	N/A	Informational
High Bleed-Through Rates on Ballots	Ballot	N/A	Informational
Improper Paper Utilized	Ballot	N/A	Informational
Inaccurate Identification of UOCAVA Ballots	Ballot	N/A	Informational
Missing Subpoena Items	Ballot	N/A	Informational
No Record of Voters in Commercial Database	Voter History	N/A	Informational
Out of Calibration Ballot Printers	Ballot	N/A	Informational
Real-Time Provisional Ballots	Voter History	N/A	Informational
Voter Registration System Audit Access	Voter History	N/A	Informational
Questionable Ballots	Ballot	N/A	Informational

4 RECOMMENDATIONS

The following sections outline the key recommendations that were determined over the course of this audit.

4.1 Result Reconciliation

Legislation should be considered that does not allow an election to be certified until the Official Canvas and the Final Voted File is fully reconciled. Furthermore, full records for every ballot sent, ballot received, ballot rejected, and ballot voided should have to be fully reconciled within a defined period after the election.

4.2 Voter Registration

Legislation should be considered that requires voter rolls to be entered in an individual's full legal name, and creates penalties for Counties that enter rolls in any other format.

4.3   Voter Rolls

Legislation should be considered that links voter roll registration to changes in driver's licenses or other state identification, as well as requiring the current voter rolls be validated against the United States Postal Service (USPS) National Change of Address (NCOA) at a predefined period prior to every election. Any voter roll software should validate that there is only one entry in the state database per identification number, such as a driver's license number.

Laws already exist for interstate reporting of changes in residence, addresses, and driver's licenses. Tying voter roll registration to these forms of identification would greatly increase the likelihood that voter registration details would be kept up to date. Individuals are much more likely to remember their license needs to be updated immediately than voter registration, and since most states now offer the ability to register to vote when getting a license, license updates could also update voter rolls.

It is recommended that the voter rolls be validated against the NCOA both 30 days or more prior to the election, in addition to a week before mail-in ballots are sent out. This check would not be utilized to purge the rolls, but to validate that a mail-in ballot should be sent prior to that ballot going out. The legislature may also want to consider whether a change of address should suspend Permanent Early Voting List (PEVL) enrollment.

In addition, legislation should be considered to require the voter rolls to periodically be compared against ERIC, the Social Security's Master Death List, or other commercially available tools that gives access to this information. Failure to do this at least once a year should come with financial penalties to the County.

4.4   Election Software

Legislation should be considered that would require applications developed and utilized for voter rolls or voting to be developed to rigorous standards that ensure the confidentiality and integrity of the systems. Specifically, its recommended that the Open Web Application Security Project (OWASP) Application Security Verification Standard (ASVS) Level 3 be applied to all applications associated with voter rolls or voting and that it be required that this be fully validation no less than once every two years. Part of this testing should be explicitly testing an programming interface access to validate that no external party has the capability to manipulate the voter rolls.

Furthermore, it should be required that whoever builds the software be required to rotate vendors doing the OWASP ASVS Level 3 assessment a minimum of once every four years, with a rotation of no less than three vendors before returning back to a vendor utilized in the past.

The vendor who performs this work must be willing to attest that their assessment fully covered the ASVS Level 3 requirements that there are no critical or high vulnerabilities detected, and that there is a remediation plan for any moderate risk vulnerabilities.

4.5   Voting Machines

Legislation should be considered that would prohibit connecting tabulators, or the Election Management System Servers or similar equipment from being connected to the internet or any other mechanism that could allow remote access to these systems.

Furthermore, County employees should have access to all administrative functions of all election equipment and have sufficient access to independently validate any configuration items on the device without requiring the involvement of any 3rd party vendor.

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In addition, electronic voting machines must always have a paper backup of all ballots which can be used to confirm that votes were cast as intended; and these machines must be regularly maintained according to the vendors recommended maintenance schedule. Failing to do so should have a financial impact on the County.

Legislation should be considered that would require that paper stocks utilized on election day should conform to manufacturer recommendations to ensure that the paper that has been tested in the device is what is actually utilized to cast votes.

4.6 Election Audits

Legislation should be considered that creates an election audit department in charge of regularly conducting audits on a rotating basis across all counties in Arizona after elections. This department should validate that the County follows all processes and procedures outlined in the Elections Procedure Manual (EPM), and have the ability to financially impact the County for repetitive EPM failures, or other failures that make auditing more difficult.

Legislation should be considered that requires batches of ballots to be clearly labeled, separated from each other in a manner where they cannot easily mix together, and easily connected to the batches run through the tabulation equipment for easy auditing of the system. Failure to follow these practices should have financial implications for the County.

Legislation should be considered with have financial and criminal penalties for purposely inhibiting a legislative investigation, or an officially sanction audit of an election.

4.7 Ballots

Legislation should be considered that will make ballot images and the Cast Vote Record artifacts from an election that is publicly published within a few days of the results being certified for increased transparency and accountability in the election process.

Legislation should further be considered that would require all ballots to be cast on paper by hand utilizing paper with security features such as watermarks or similar technology; with a detailed accounting of what paper(s) and the quantities utilized for any given election cycle.

Mail-in voting should incorporate an objective standard of verification for early voter identification, similar to the ID requirements required for in person voting.