IN THE UNITED STATES DISTRICT COURT FOR THE NORTHERN DISTRICT OF GEORGIA ATLANTA DIVISION

DONNA CURLING, et al. **Plaintiff,** **vs.** **BRAD RAFFENSPERGER, et al.** **Defendant.**	**CIVIL ACTION FILE NO.: 1:17-cv-2989-AT**

DECLARATION OF PHILIP B. STARK

PHILIP B. STARK hereby declares as follows:

This statement supplements my declarations of September 9, 2018; September 30, 2018; October 22, 2019; December 16, 2019; August 23, 2020; August 31, 2020; September 13, 2020; August 2, 2021; and January 11, 2022 (augmented March 9, 2022). I stand by everything in my previous declarations and incorporate them by reference.

The Coffee County Security Breach

1. I attended (virtually) the video depositions of Cathy Latham (8 August 2022), SullivanStrickler corporate representative Dean Felicetti (2 September 2022), former Coffee County Election Supervisor Misty

Hampton (11 November 2022), Cyber Ninjas CEO Doug Logan (18 November 2022), Jeffrey Lenberg (21 November 2022), and Alex Cruce (22 November 2022).

2. I understand from their testimony and documents I reviewed that a number of unauthorized parties had physical access to many, if not all, components of the voting system in Coffee County in early 2021. Those parties had enough access to corrupt the installed software or implant malware on the devices. Moreover, I understand that SullivanStrickler copied all the digital information from ("imaged") the drives of many pieces of equipment and posted the images to a ShareFile site online. I understand that an unknown number of individuals downloaded the images, and that those images might subsequently have been shared with other individuals.

3. The 22 November 2022 declaration of Prof. J. Alex Halderman explains that the information gleaned through unauthorized access included passwords, among other things. That declaration also explains some ways in which the design of that software is poor from a cybersecurity standpoint, and how the information obtained could be used to undermine Georgia's elections, not only in Coffee County, but across the state.

The Ability of Audits to Detect and Correct Erroneous Outcomes

4. Audits cannot remedy the statewide security problems that were created or exacerbated by the Coffee County breach, for a variety of reasons. The 2022 so-called "risk-limiting audit" did not protect Georgia's recent election from possible consequences of the breach.
5. First, as I have previously testified, no audit can reliably determine whether ballot-marking devices (BMDs) altered enough votes to change who appeared to win. In Georgia, a genuine risk-limiting audit is not currently possible, in part because Georgia's heavy reliance on BMDs.
6. Moreover, even if Georgia exclusively used hand-marked paper ballots, Georgia elections lack the physical accounting controls on voted ballots needed to ensure that every validly cast ballot—and no other—is included in the tabulation and in the universe of ballot cards from which the audit draws its sample. Thus, any audit that Georgia might perform cannot protect against the possibility that the Coffee County breach resulted in changed election outcomes, in Coffee County or other counties.
7. There was an audit that started on 17 November 2022 of the 2022 midterm contest for Secretary of State, described as a "risk-limiting audit" (RLA).[1]

[1] See https://sos.ga.gov/news/georgias-2022-statewide-risk-limiting-audit-confirms-results (last visited 26 November 2022)

8. While I have not had adequate time to digest the details nor to search exhaustively, it is clear from the available information that this audit was not a genuine RLA, nor an effective audit, for a variety of reasons, including but not limited to the following.
9. The underlying paper trail was not a trustworthy record of voters' selections, in part because of the heavy reliance on BMDs for in-person voters (advanced and election-day).
10. To the best of my knowledge, there was no mandatory ballot accounting, pollbook reconciliation, eligibility auditing, chain-of-custody checks, or other measures to ensure that the paper trail was complete and intact.
11. Risk-limiting audits require a *ballot manifest* that describes how many ballots there are and how they are stored: the number of containers, the identifier of each container, and the number of ballot cards in each container. The ballot manifest is used to select the ballots to inspect manually during the audit. It should be constructed using *physical inventories* of ballots. Instead, *Georgia's audit procedure trusted the voting system*[2] *to correctly report how many ballots there were in all, and*

[2] The manifest for each county was constructed by exporting cast-vote records (CVRs) from the voting system, then processing those CVRs with the Arlo software. See Appendix 1, "Summary of Steps to Complete in Arlo to Prepare for Audit," which I understand was sent to Georgia election officials by Blake

how many there were in each "batch." That is not how to conduct an RLA. To see why this is an issue, the voting system could simply fail to report results for one or more batches. Then the ballot manifest will not contain those batches, so sampling batches at random from the manifest cannot discover that ballots were omitted from the tabulation: the audit would have no chance of discovering the problem, even if those batches changed the outcome. The double and triple inclusion of some ballots in the tabulation by some Georgia counties in 2020 (described in my report dated 9 March 2022 at ¶58–83) shows that the electronic records are not reliable and that at least some Georgia counties do not maintain an accurate physical accounting of voted ballots and/or memory cards. Moreover, malware could cause the voting system to omit (or add) cast-vote records ("CVRs"), so the number of CVRs might not equal the number of validly cast ballots. Scanner jams and other problems can also result in omitting or adding CVRs. CVRs are not a reliable basis for constructing a ballot manifest. The audit improperly trusted the voting system for crucial information that—if incorrect—would undermine the ability of the audit to detect and correct erroneous election outcomes.

Edwards on 14 November 2022. The document was provided to me by Marilyn Marks of Coalition for Good Governance, who I understand obtained it through an open records request.

12. The fact that on or about 16 November 2022 it was discovered that a memory card from the November 2022 election in Cobb County had not been uploaded to the voting system[3] is additional confirmation that Georgia lacks adequate procedures for keeping track of election materials, and that the voting system's exported CVRs cannot be relied upon to construct the ballot manifest.

13. The audit instructions leave the treatment of discrepancies between the number of ballots according to the manifest and the number of ballots the auditors find in the audited batches up to the election official, allowing them to ignore or investigate discrepancies.[4] That is not a proper way to conduct an RLA. Discrepancies between the reported and actual number of ballots need to be taken into account in calculating the risk and determining whether and when the audit can stop short of a full hand count.

14. An email from VotingWorks to local election officials dated 17 November 2022 says that the Arlo software calculates the number of non-votes, so

[3] See https://cobbcountycourier.com/2022/11/breaking-story-memory-card-not-uploaded-in-cobb-election-results-lynette-burnette-winner-of-kennesaw-post-1-city-council-seat/ (last visited 5 December 2022).

[4] See Appendix 2, "Risk Limiting Audits" slide deck dated 13 October 2022, at 34. This document was provided to me by Marilyn Marks of Coalition for Good Governance, who I understand obtained it through an open records request.

they do not need to be tabulated and entered.[5] That is a poor choice, because it means that the Arlo software cannot detect or account for errors in the ballot manifest in determining whether the risk limit has been met or whether the outcome is correct.

15. The Secretary of State arbitrarily attributed vote discrepancies in the audit "largely" to manual errors in the audit. According to a press release from Secretary Raffensperger dated 18 November 2022, "[t]his small amount of difference is well within the expected margin of error for an audit of this size, and it is largely caused by human error during the hand counting process."[6] But no evidence has been provided to support the claim that the discrepancies are "largely" due to error in the hand count and not to error in the machine count. Moreover, Secretary Raffensperger's statement reveals a misunderstanding of how RLAs work: in an RLA, the (carefully performed) manual tabulation is considered ground truth and discrepancies are attributed entirely to error in the machine count. The audit's manual tallies must be conducted with adequate care and attention to ensure they are trustworthy, and any discrepancy should be investigated

[5] See Appendix 3, Email from Virginia Vander Roest of VotingWorks. This document was provided to me by Marilyn Marks of Coalition for Good Governance, who I understand obtained it through an open records request.
[6] See https://sos.ga.gov/news/georgias-2022-statewide-risk-limiting-audit-confirms-results (last visited 5 December 2022)

to confirm that the manual tally is indeed correct. Blindly assuming that any discrepancies are due to errors in the hand count undermines the entire purpose of the audit.

16. According to the same press release by Secretary Raffensperger, "[t]his audit shows that our system works and that our county election officials conducted a secure, accurate election." All these claims are false: the audit did not check whether the system "worked"; it did not check whether the election was secure; and it did not check whether the results were accurate. It merely checked the tabulation of some batches. It did not check whether BMDs functioned correctly, whether all validly cast ballots were included in the tally, or whether the tabulation was accurate, for instance.

17. The audit was allegedly a "batch-comparison" risk-limiting audit. The Arlo documentation says that the method it implements for batch-comparison RLAs is a method I invented in 2007 and published in 2008. That method contains a number of parameters the auditors can select. Those parameters affect the initial sample size and the conditions under which the audit can stop without a full hand count. To the best of my knowledge, Georgia has not made public the particular choices of those parameters used in that audit. Hence, it is impossible for the public to

determine whether the initial sample size was set correctly or whether the audit stopped appropriately.

18. For an audit to provide public evidence that the reported outcome of the Secretary of State contest is correct, the public needs (among other things):

    a. A *trustworthy* ballot manifest based on physical accounting of validly cast ballots. This was never constructed. Instead, as decribed above, the audit relied on a ballot manifest constructed from electronic voting machine records (using Arlo)[7] by assuming that every validly cast ballot had a corresponding CVR in the data exported from the voting system. That is, the audit *assumed* that every validly cast ballot was scanned and included exactly once and *assumed* that the voting system functioned properly. The audit is supposed to *check* whether every validly cast ballot had been included exactly once in the tally and *check* whether the voting system misbehaved in a way that changed who appeared to win.

    b. The reported batch subtotals for the audit. These were provided at https://sos.ga.gov/news/georgias-2022-statewide-risk-limiting-audit-confirms-results, but the batches included are only those that

[7] See Appendix 1.

are listed in the (untrustworthy) manifest derived from the same electronic records exported from the voting system. Thus, the public has no reason to believe the list of batch subtotals is complete. As mentioned above, the failure to scan one or more batches or to upload the scans of one or more batches would not be discovered by the audit, even if the votes in those batches would change the electoral outcome.

c. The CVRs exported from the Dominion system, used as input to Arlo. These were not provided by the Secretary of State's office, but I understand they might be available through open records requests.

d. The software settings for Arlo. To the best of my knowledge, these were not provided to county election officials, the monitors, the press, or the public. Knowing the settings is important for many reasons. One is that the Secretary had each county audit two types of batches, one consisting of hand-marked ballots and the other of BMD printout.[8] That constraint complicates how the sample is

[8] Press conference with Secretary Brad Raffensperger and Director Blake Evans, 14 November 2022. https://www.gpb.org/news/2022/11/17/georgia-counties-conduct-audit-of-secretary-of-state-race (last visited 5 December 2022) In the same press conference, Director Evans makes a number of unfounded claims, including

drawn, how the initial sample size is calculated, and how the risk is measured from the sample. There are important technical issues involved; mistakes could undermine the ability of the audit to limit the risk.

e. Adequate observation of the manual tally to be able to determine (i) whether the correct batches were retrieved for audit and (ii) whether the manual tallies of the votes in those batches were correct. I understand that the public was kept so far from the audit activities in some counties that they could not observe those things.[9] Indeed, in Gwinnett County, observers (and auditors) failed to notice a process failure that resulted in an error of 20 votes in the hand tally. (It is noteworthy that the Secretary of State mandated using the "sort-and-stack" approach to counting votes rather than the "call-and-tally" approach, which is both easier to

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the claim (in advance of the audit!) that the audit will show that the results are correct and that any discrepancies will be due to errors in the manual count rather than errors in the electronic counts, again turning RLAs inside out. An RLA assumes that the hand count is conducted carefully enough to be the reliable touchstone and attributes all discrepancies to the machine count. And an RLA does not show that the results are correct: it *checks* whether the outcomes are correct, and (with high probability) corrects them if not.

[9] See Appendix 4, Declaration of Aileen Nakamura, and Appendix 5, Declaration of B. Joy Watson. They were unable to see the faces of the ballots during the audit and thus unable to determine whether the hand count was conducted properly. They were also unable to see the data entry into Arlo.

observe and—according to references the Secretary has previously cited for authority—more accurate.[10])

f. Adequate observation of the data input to Arlo to determine whether the hand-count totals were entered correctly and whether the audit stopped appropriately. To the best of my knowledge, the public currently lacks the information required to tell. Per the declaration of Aileen Nakamura dated 5 December 2022 (Appendix 4), the data entry into Arlo was not visible to the public in Gwinnett County. Per the declaration of B. Joy Watson dated 5 December 2022 (Appendix 5), the data entry into Arlo was not visible to the public in Fulton County. There was a substantial problem with inaccurate data entry into Arlo in the 2020 so-called risk-limiting audit.[11]

19. Even if there had been a trustworthy paper trail—which Georgia's elections lack—and even if the so-called RLA had been a genuine RLA—which it was not—an audit of a single contest (e.g. the Secretary of State contest) provides no evidence that any other contest was decided correctly.

[10] See ¶56 of my declaration of 9 March 2022.
[11] See ¶32–45 of my declaration of 9 March 2022.

20. The Secretary of State's office has made a number of incorrect or misleading claims about what the audit could accomplish. For instance, state election director Blake Evans claimed: "The audit will, with statistical confidence, show that the outcome of the election was correct. It will also show that the machines that tabulated the votes worked properly."[12] The audit shows neither, but even if it showed the latter, no audit in Georgia can show the former until and unless Georgia reduces its reliance on BMDs, performs a more rigorous canvass, tracks chain of custody more seriously, and accounts for voted ballots physically.

21. I understand that an "optional" RLA is planned for the U.S. Senate runoff election.[13]

22. It is impossible to conduct an RLA of a statewide contest unless every county participates. More generally, it is impossible to conduct an RLA of any contest that crosses jurisdictional boundaries unless every jurisdiction in which votes were validly cast in the contest participates.[14]

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[12] See https://www.gpb.org/news/2022/11/17/georgia-counties-conduct-audit-of-secretary-of-state-race (last visited 5 December 2022)

[13] Email from Blake Evans, Georgia Elections Director, dated 1 December 2022, attached hereto as Appendix 6. This document was provided to me by Marilyn Marks of Coalition for Good Governance, who I understand obtained it through an open records request.

[14] I am ignoring "edge cases," such as the possibility that so few votes were cast in some county that those votes cannot change the overall outcome of the contest.

The DVSOrder Privacy Vulnerability

23. For an audit to justify public trust in election outcomes, it must provide adequate transparency and public observation, including key inputs. Flaws in the design of the Dominion ICP (precinct scanner) software that can infringe voters' rights to a secret ballot conflict with the public's need to see key inputs to the audit of the 2022 midterm election, which relied on CVRs to construct the ballot manifest. Thus, the need to provide the public crucial information about the audit is in tension with voters' right to a private ballot.

24. Prof. J. Alex Halderman and several of his collaborators discovered (using public documents) that the "random" identifier for cast-vote records in Dominion ICP and ICE scanners was generated in a completely predictable way, aside from a "starting value" that could be determined from the CVRs themselves.[15] They explain how the predictability of the "RecordID" can be used to compromise voter privacy in practice. This privacy vulnerability is called "DVSOrder."

25. I received the CVR exports from the Dominion systems in two Georgia counties, Coffee and Heard, from Marilyn Marks of Coalition for Good

[15] See https://dvsorder.org/ (last visited 30 November 2022).

Governance; I understand she obtained them through open records requests.

26. I used those exports to test whether the DVSOrder vulnerability occurred in those counties in the current election. I was able to confirm that the identifiers assigned to CVRs for each tabulator were a contiguous block of numbers from the sequence identified in the Halderman et al. work, cross-checking their findings. The software I wrote for that purpose is in Appendix 7.

27. Thus, for example, I can say that the first person whose vote was tabulated on tabulator 10 in Coffee County voted for Chase Oliver for Senator. The second, third, fourth, and fifth voted for Herschel Walker. The sixth voted for Raphael Warnock. Etc.

28. As described in the DVSOrder disclosure, that information can be used to determine individual voters' selections by combining it with polling place observations of the sequence of voters scanning their ballots by pollworkers, other voters, pollwatchers, or people reviewing surveillance video, or by observing the value of the scanner counter before or after a given voter scanned their ballot.

29. Thus, Georgia's current procedures concerning the release of "raw" CVRs as part of the audit process seriously compromise voter privacy.

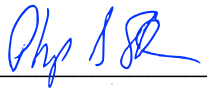
DVSOrder.org describes simple, inexpensive steps that could be taken to close this privacy vulnerability without losing any information relevant to the trustworthiness of election results.

Supplementation

30. I may supplement this report, for instance, if more information about the audit of the Secretary of State contest or of the U.S. Senate runoff contest becomes available.

I declare under penalty of perjury, in accordance with 28 U.S.C. § 1746, that the foregoing is true and correct.

Executed on this date, 5 December 2022,



Philip B. Stark

APPENDIX

1

Summary of Steps to Complete in Arlo to Prepare for Audit

Please note that all counties should review the October 13th RLA training, which can be found on Firefly at this location: Webinars > 2022 Webinars > 10.13.2022 RLA Audit Training.

Steps:

1. **Sign up for your Arlo account.**
    a. Your county office can have 2 Arlo administrator accounts. Those administrator accounts will be able to create accounts for additional users in your office. Only the 2 administrators will be able to complete submission to the Secretary of State at the end of the audit. If you have not already, complete the following survey to indicate who in your office should have admin credentials:

2. **As soon as you certify your results at the county level, generate your Cast Vote Records and Tabulator Status Reports.**
    a. For instructions on how to generate these reports, review Appendix A.
3. **Upload your Cast Vote Records and Tabulator Status Reports into Arlo.**
    a. For instructions on how to upload these reports, review pages 1 and 2 of Appendix B.
4. **Download your Batch Inventory Worksheet and verify the ballot counts in the worksheet. Once you have verified the numbers, confirm that you have completed the worksheet by checking the appropriate box in Arlo. Then hit "Continue."**
    a. Review pages 2 and 3 of Appendix B for more information.
5. **Based on the data you provide, Arlo will generate 2 files: 1. Ballot Manifest; and 2. Candidate Totals by Batch. Download both files, and save them so you can easily access the files.**
    a. Review page 4 of Appendix B for more information.
6. **After you click, "Return to Audit Source Data," scroll down to the Ballot Manifest and Candidate Totals by Batch sections. Upload the Ballot Manifest file that you just saved, and then upload the Candidate Totals by Batch file that you just saved.**
7. **Wait for your random batch selections to appear in Arlo. These should appear in the evening on Wednesday, November 16th after the Secretary of State kicks off the audit.**
8. **All counties will begin the audit on Thursday, November 17th.**

LOT INVENTORY TOOL
AT YOU WILL GENERATE

APPENDIX A - PAGE 1 (

ast Vote Records

This report lists every ballot scanned during the entire election along with how the voting system recorded the voter's selections.
You will check the tabular format option in order to export the file as a CSV.
This is the same as the file type that you generate in response to Open Records Requests.

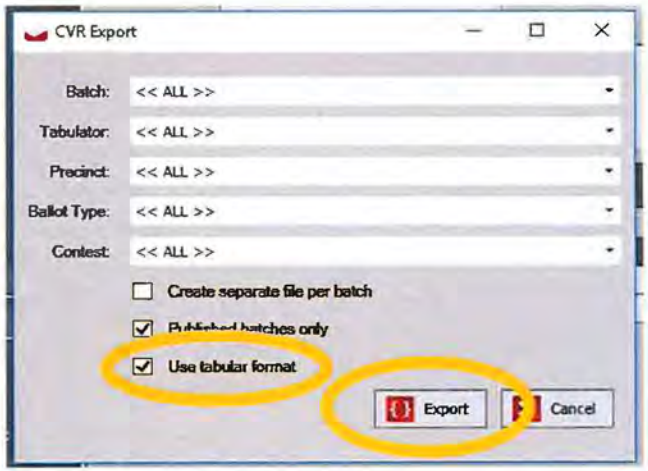
abulator Status Report

This report lists every tabulator contained in your database along with how many ballots were recorded by that tabulator.
Any tabulators with uploaded results will have a "Load Status" of 1.
Any tabulators with a "Load Status" of 0 either were not uploaded or were never downloaded and used.

- *Remember that it is up to you to ensure that all your votes have been uploaded to the RTR System – the system will not check that for you.*

LOT INVENTORY TOOL APPENDIX A - PAGE 2 O
NERATE CAST VOTE RECORD AS CSV

om the RTR Menu Bar, Select Actions -> Export -> CVR Export
neck the "Use tabular format" option
ick "Export"
opup will appear to confirm that the Cast Vote Records have been exported.
ick Close.



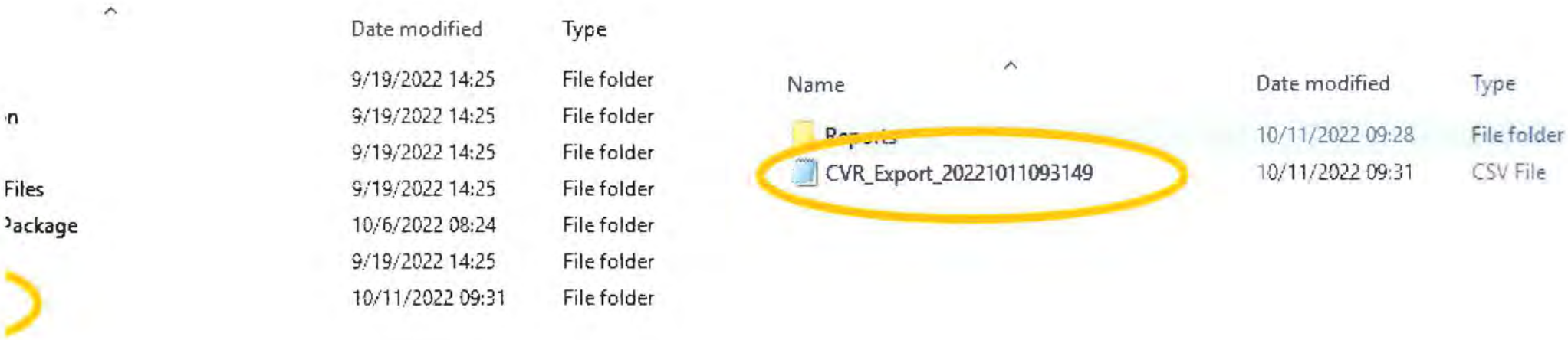
LOT INVENTORY TOOL APPENDIX A - PAGE 3 C
NERATE TABULATOR STATUS REPORT

elect "Basic" from the Reports section of the left-hand menu in the RTR.
elect "Tabulator Status" from the Report Name drop down menu.
ick "Create Report"
opup will appear to confirm that the Requested Reports have been created.

LOT INVENTORY TOOL
PY CVR TO USB DRIVE

APPENDIX A - PAGE 4 O

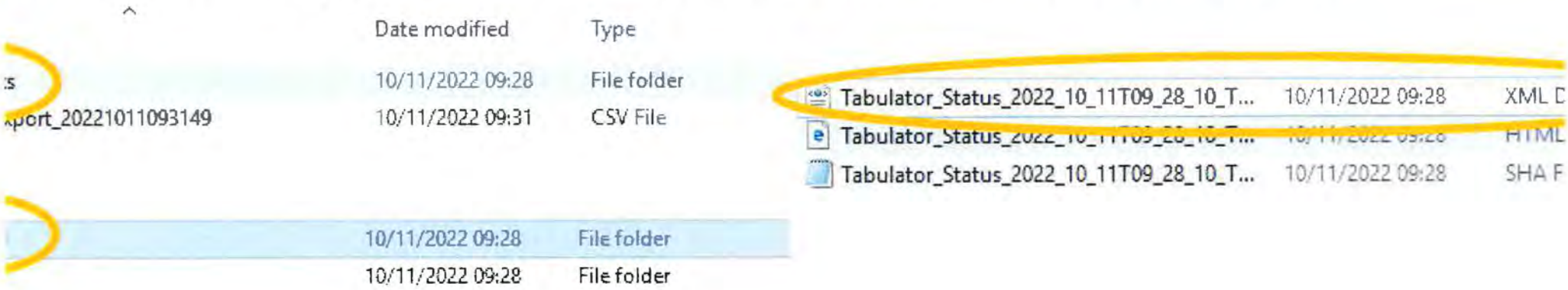
avigate to the current election directory in your NAS folder.
pen the Results folder.
opy the CVR_Export file to a USB Drive.



LOT INVENTORY TOOL APPENDIX A - PAGE 5 (

PY TABULATOR STATUS REPORT TO USB DRIVE

pen the Reports folder.
pen the Filtered folder.
py the Tabulator Status Report to the same USB Drive.
te: You need to copy the version that says "XML Document" next to the file name.



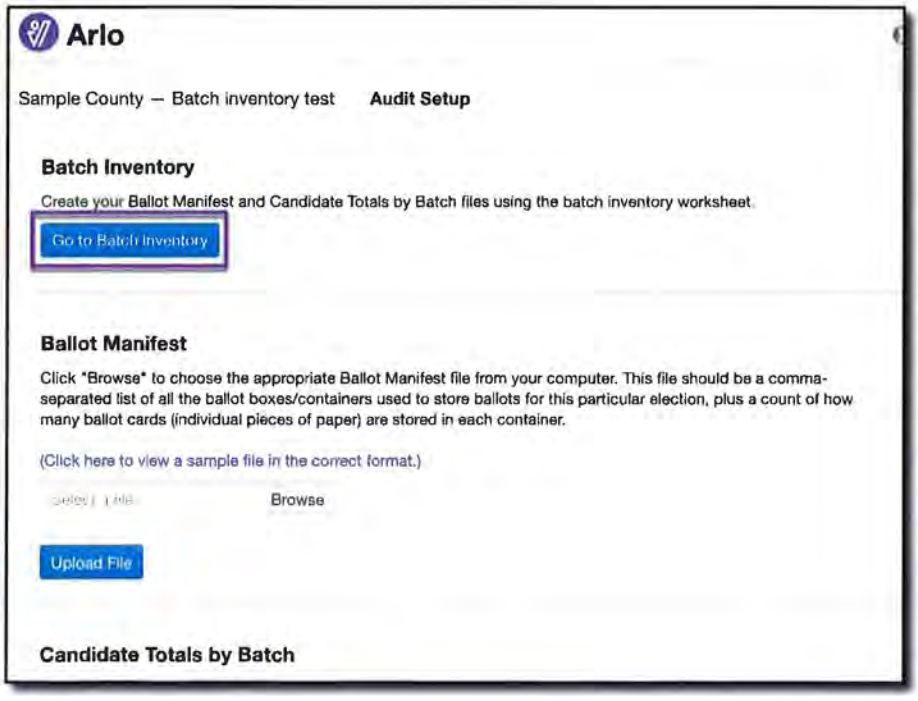
APPENDIX B - PAGE 1 OF 4

Georgia Batch Inventory Tool Guide

The Batch Inventory in Arlo, allows counties a quick inventory list to use to verify their stored batch inventory prior to the start of an audit.

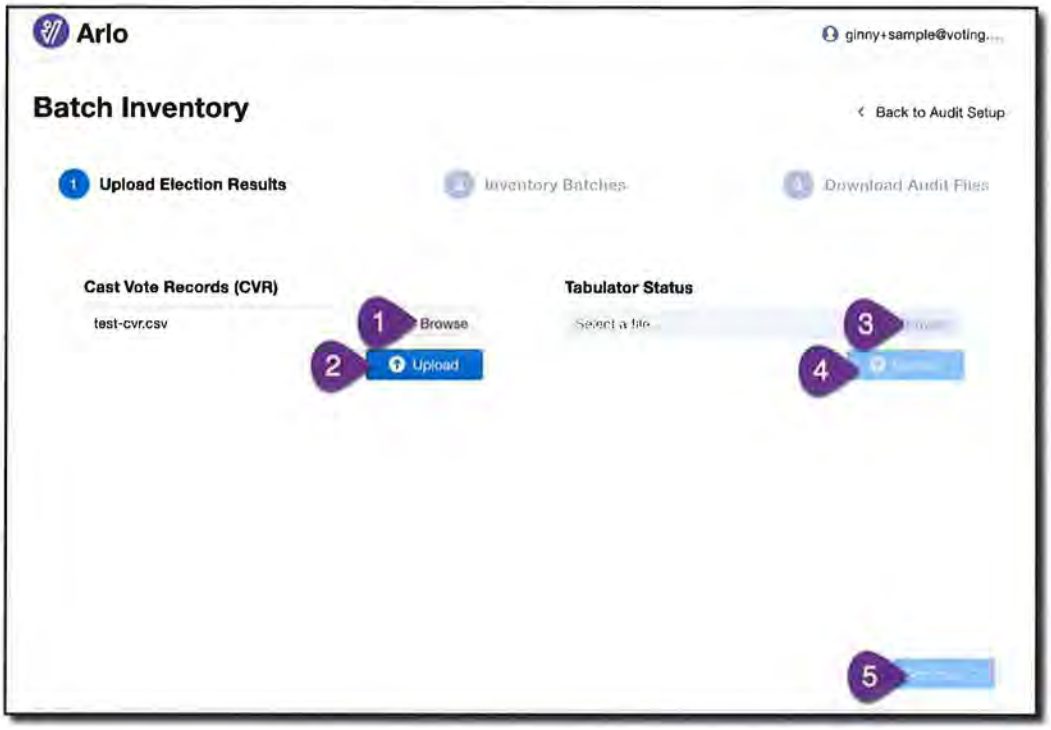
To use this tool, simply log in to Arlo as you would for an audit by entering your email address in the box and selecting Log in to your audit. A code will be sent to your email address to be used as your login credential.

Next, select Go to Batch Inventory.

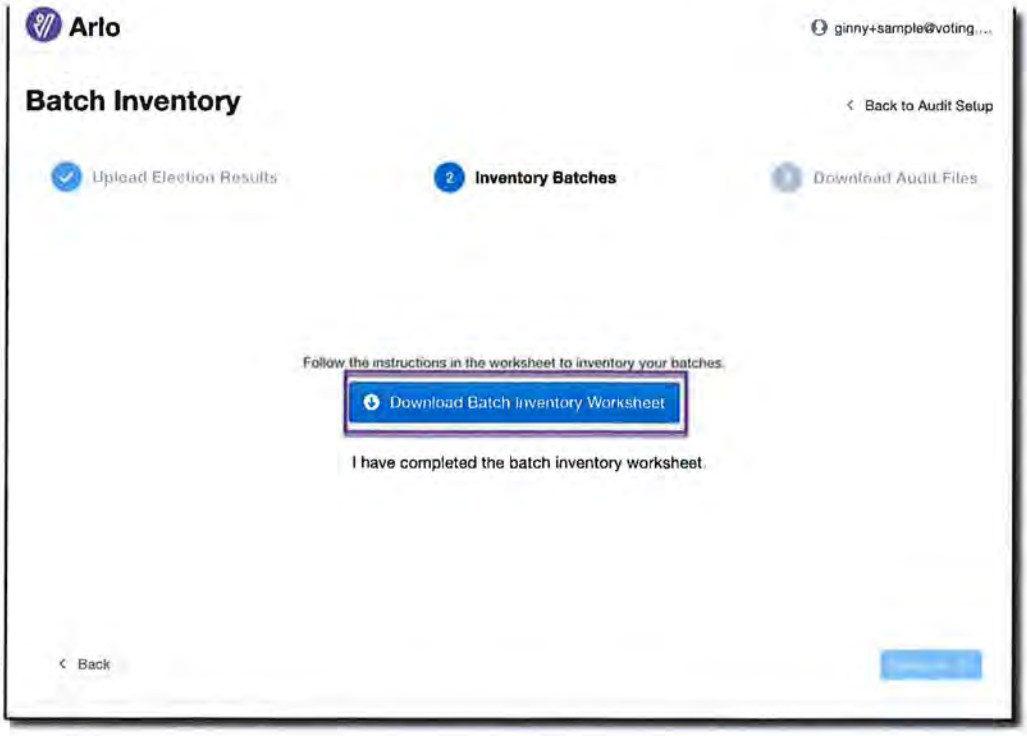


APPENDIX B - PAGE 2 OF 4

Upload your Cast Vote Records (CVRs) and Tabulator Status file by selecting the Browse button and locating the file saved from your Election Management System (EMS) and then selecting Upload for each file. Then select Continue in the lower right corner.

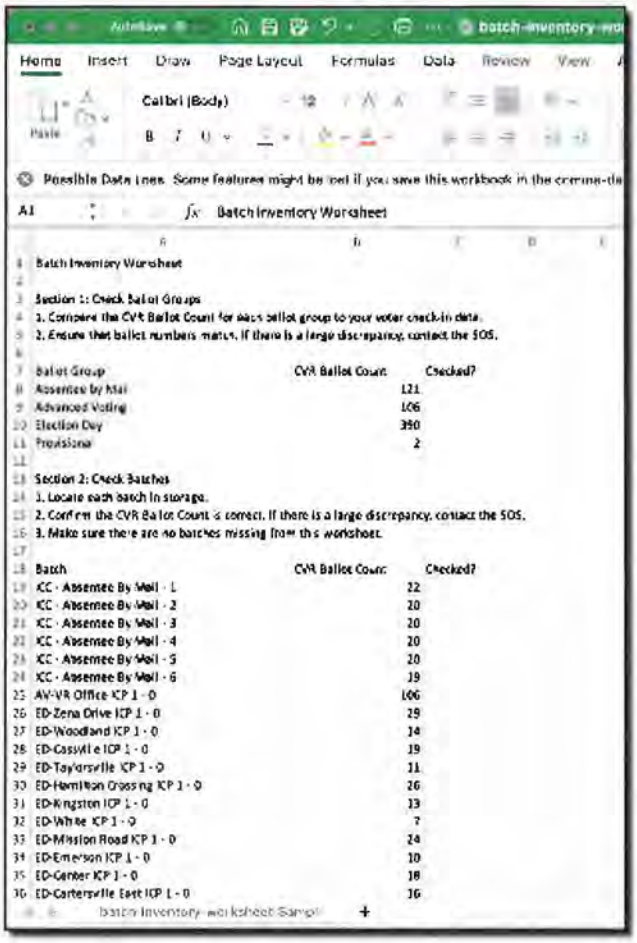


Your Batch Inventory Worksheet will be created and can be downloaded by selecting the Download Batch Inventory Worksheet button in the middle of the screen.



APPENDIX B - PAGE 3 OF 4

The Ballot Inventory Worksheet is a .csv file that can be opened and printed in a spreadsheet program like Excel and Google Sheets. Each section of the worksheet should be reviewed carefully and compared to voter check-in data.



Batch Inventory Worksheet

Section 1: Check Ballot Groups
1. Compare the CVR Ballot Count for each ballot group to your voter check-in data.
2. Ensure that ballot numbers match. If there is a large discrepancy, contact the SOS.

Ballot Group	CVR Ballot Count	Checked?
Absentee by Mail	121	
Advanced Voting	106	
Election Day	350	
Provisional	2	

Section 2: Check Batches
1. Locate each batch in storage.
2. Confirm the CVR Ballot Count is correct. If there is a large discrepancy, contact the SOS.
3. Make sure there are no batches missing from this worksheet.

Batch	CVR Ballot Count	Checked?
ICC - Absentee By Mail - 1	22	
ICC - Absentee By Mail - 2	20	
ICC - Absentee By Mail - 3	20	
ICC - Absentee By Mail - 4	20	
ICC - Absentee By Mail - 5	20	
ICC - Absentee By Mail - 6	19	
AV-VR Office ICP 1 - 0	106	
ED-Zena Drive ICP 1 - 0	29	
ED-Woodland ICP 1 - 0	14	
ED-Cassville ICP 1 - 0	19	
ED-Taylorsville ICP 1 - 0	11	
ED-Hamilton Crossing ICP 1 - 0	26	
ED-Kingston ICP 1 - 0	13	
ED-White ICP 1 - 0	7	
ED-Mission Road ICP 1 - 0	24	
ED-Emerson ICP 1 - 0	10	
ED-Center ICP 1 - 0	18	
ED-Cartersville East ICP 1 - 0	16	

Section 1 provides totals for each ballot group type, including Absentee by Mail, Advanced Voting, Election Day, and Provisional. Verify these totals match your known voter totals.

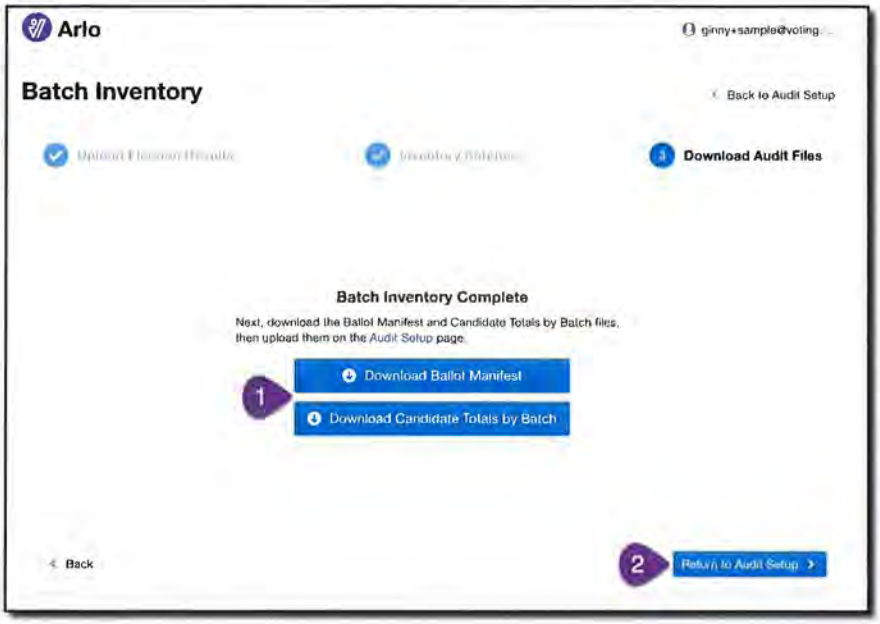
Section 2 provides total ballots by batch. Verify each batch is present in your physical inventory and matches your reconciliation form counts. Verify no batches are missing.

If batches are missing, they should be added to your EMS and a new CVR file should be downloaded from the EMS and uploaded into Arlo.

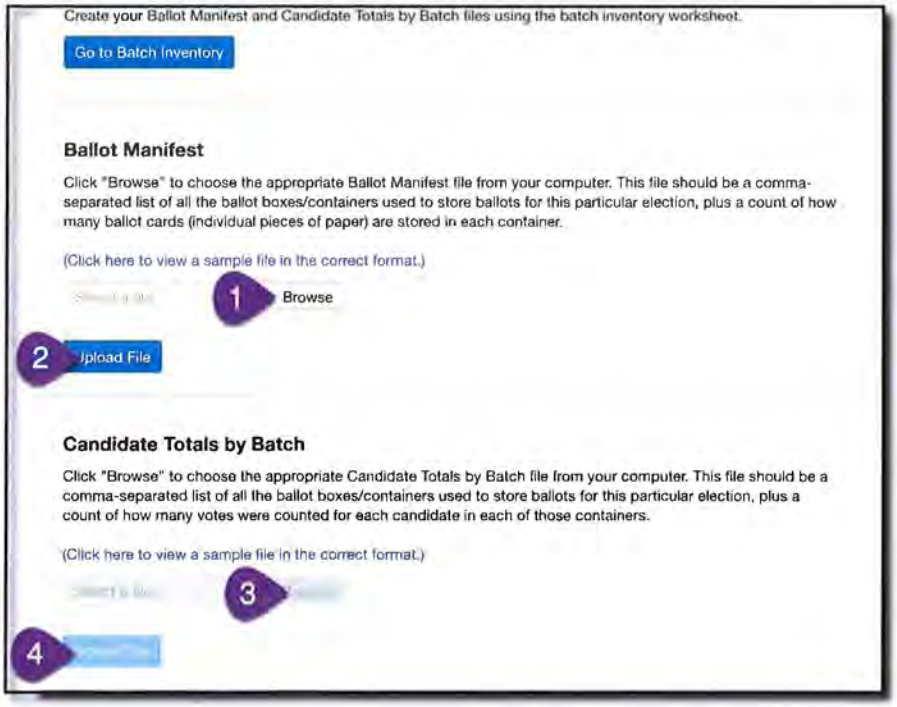
Once all batches have been confirmed, go back into Arlo and mark the I have completed the batch inventory worksheet box and select Continue.

APPENDIX B - PAGE 4 OF 4

The tool will generate your Ballot Manifest and Candidate Totals by Batch files for the audit. Simply download each file and select Return to Audit Setup.



Then upload each file into Arlo for the audit by selecting the Browse button and locating the file saved on your computer and then selecting Upload for each file.



Your pre-audit files are now uploaded and are ready for the audit to be launched by the Department of State.

APPENDIX 2

SOS ELECTIONS DIVISION

RISK LIMITING AUDITS

OCTOBER 13, 2022

GEORGIA ELECTIONS DIVISION

VISION

To produce trusted results that reflect the will of eligible Georgia voters.

MISSION

To ensure and promote secure, accurate, and fair elections that Georgia voters can have confidence in and to be a trustworthy custodian of Georgia's Great Seal.

TRAINING AGENDA

- Audit timeline
- Preparing for the audit
- Ballot Inventory Tool
- Conducting the audit
- Additional items to consider
- Q&A

AUDIT TIMELINE

Date/Time	Activity
November 8, 2022	Election Day
Between November 9 and November 15	Secretary of State announces contest to be audited.
November 15, 2022	Last day to for counties to certify results and upload Cast Vote Records into the Batch Inventory Tool
November 16, 2022	All counties must use the provided Batch Inventory Tool to verify batches and submit ballot manifests into Arlo by 5:00PM.
November 17, 2022	Counties must begin the audit on this day.
5:00pm on November 22, 2022	Deadline for counties to complete audit.
Thursday, November 24, 2022	Thanksgiving
5:00pm on November 25, 2022	Deadline for SOS to certify results.

AUDIT PREPARATION THAT YOU CAN BE DOING NOW

- Make sure that you have a space reserved for the audit.
- Consider whether you will need security to be at the audit.
- Organize a Vote Review Panel for the audit and consider when you will want them to meet. (Vote Review Panels - OCGA 21-2-483)
- Get badges prepared for every person participating in the audit.
- Prepare your notice for the audit.

AUDIT PREPARATION THAT YOU CAN BE DOING NOW

- Review audit laws and State Election Board Rules
  - OCGA 21-2-498
  - SEB Rule 183-1-15-.04

AUDIT PREPARATION THAT YOU CAN BE DOING NOW

- Inform both party chairs in your county.
  - Make sure they know the estimated timeline for the audit.
- Recruit people to observe the audit.
  - Encourage people to attend, especially those who have concerns about the process.

Remember that transparency is essential!!!

AUDIT MONITORS

- Parties with candidates on the ballot will be able to designate monitors.
  - A good rule is to allow 1 monitor from each political party/body per audit team.
  - If you only have 1 audit team, you should allow a minimum of 2 monitors from each political party/body.

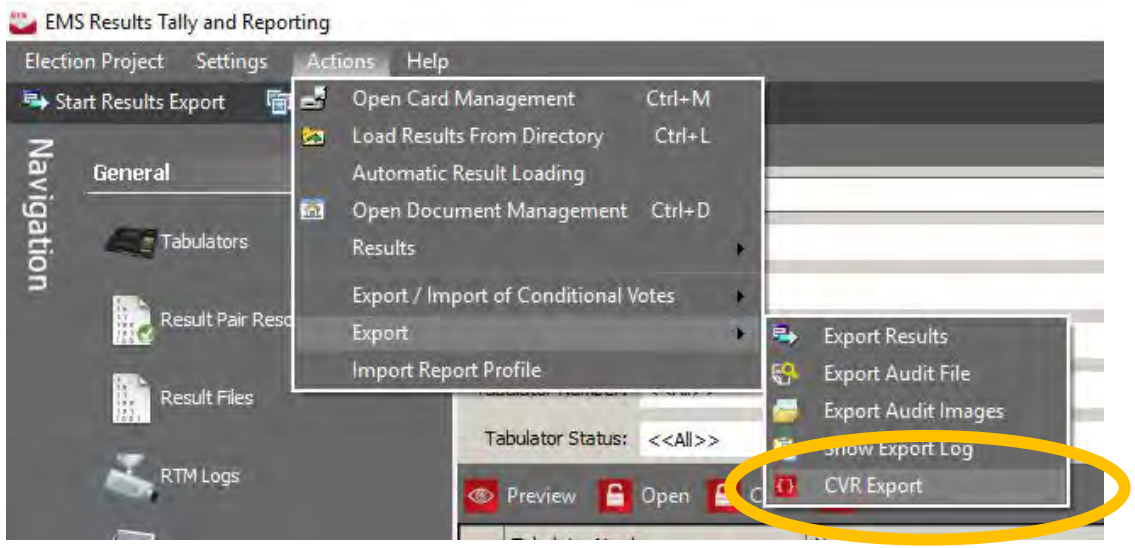
Remember that transparency is essential!!!

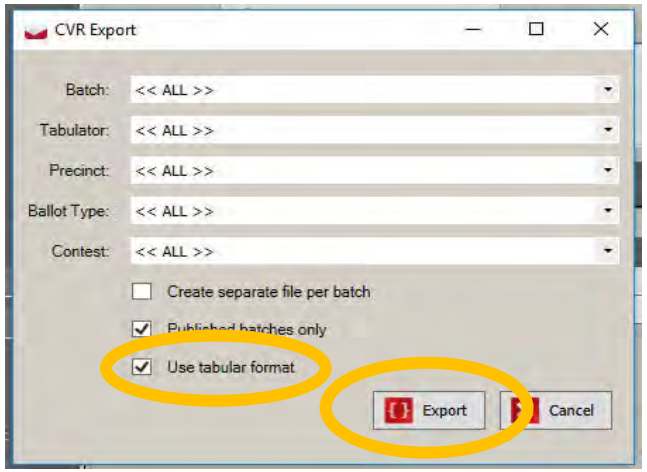
BALLOT INVENTORY TOOL
WHAT YOU WILL GENERATE

- Cast Vote Records
  - This report lists every ballot scanned during the entire election along with how the voting system recorded the voter's selections.
  - You will check the tabular format option in order to export the file as a CSV.
  - This is the same as the file type that you generate in response to Open Records Requests.
- Tabulator Status Report
  - This report lists every tabulator contained in your database along with how many ballots were recorded by that tabulator.
  - Any tabulators with uploaded results will have a "Load Status" of 1.
  - Any tabulators with a "Load Status" of 0 either were not uploaded or were never downloaded and used.
    - *Remember that it is up to you to ensure that all your votes have been uploaded to the RTR System – the system will not check that for you.*

BALLOT INVENTORY TOOL
GENERATE CAST VOTE RECORD AS CSV

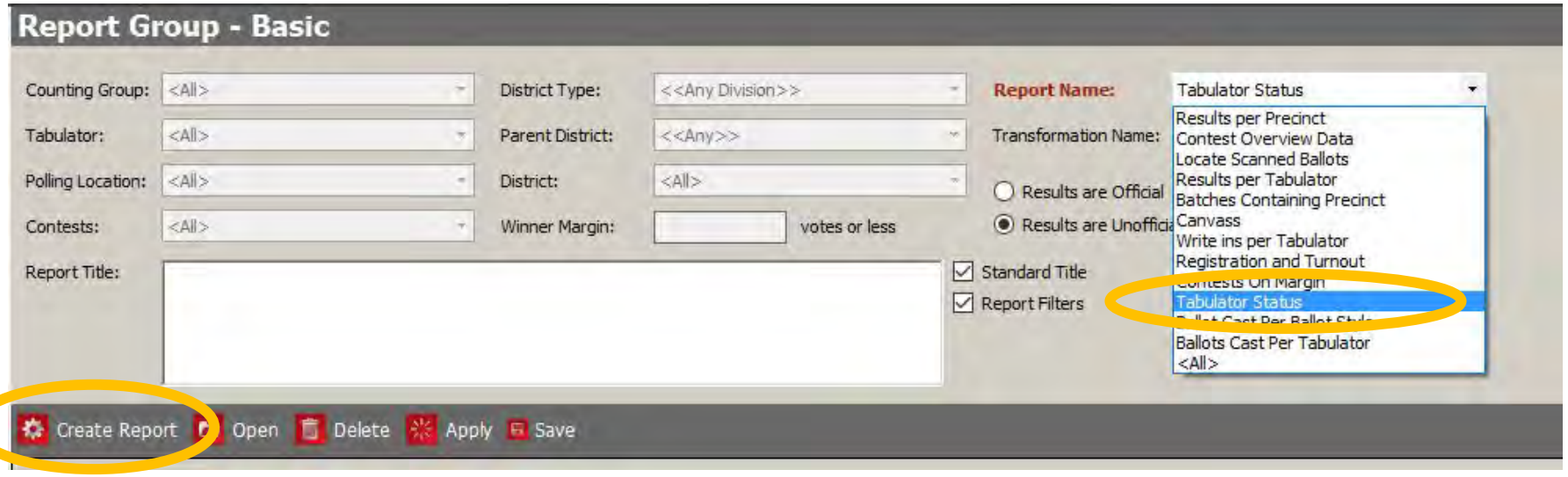
1. From the RTR Menu Bar, Select Actions -> Export -> CVR Export
2. Check the “Use tabular format” option
3. Click “Export”
4. A popup will appear to confirm that the Cast Vote Records have been exported. Click Close.





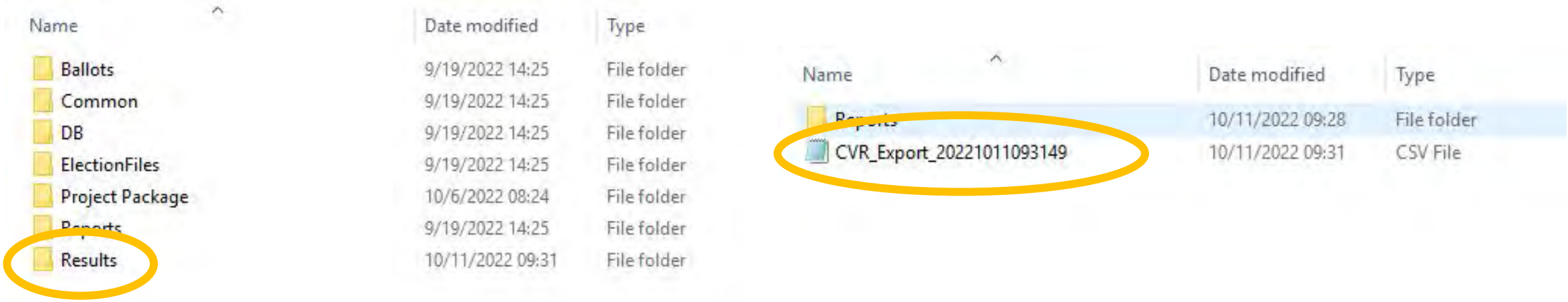
BALLOT INVENTORY TOOL
GENERATE TABULATOR STATUS REPORT

1. Select “Basic” from the Reports section of the left-hand menu in the RTR.
2. Select “Tabulator Status” from the Report Name drop down menu.
3. Click “Create Report”
4. A popup will appear to confirm that the Requested Reports have been created.



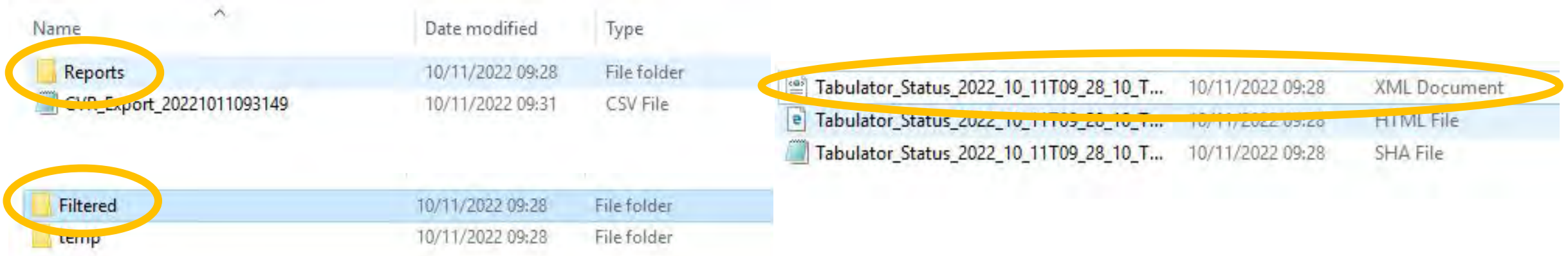
BALLOT INVENTORY TOOL
COPY CVR TO USB DRIVE

1. Navigate to the current election directory in your NAS folder.
2. Open the Results folder.
3. Copy the CVR_Export file to a USB Drive.

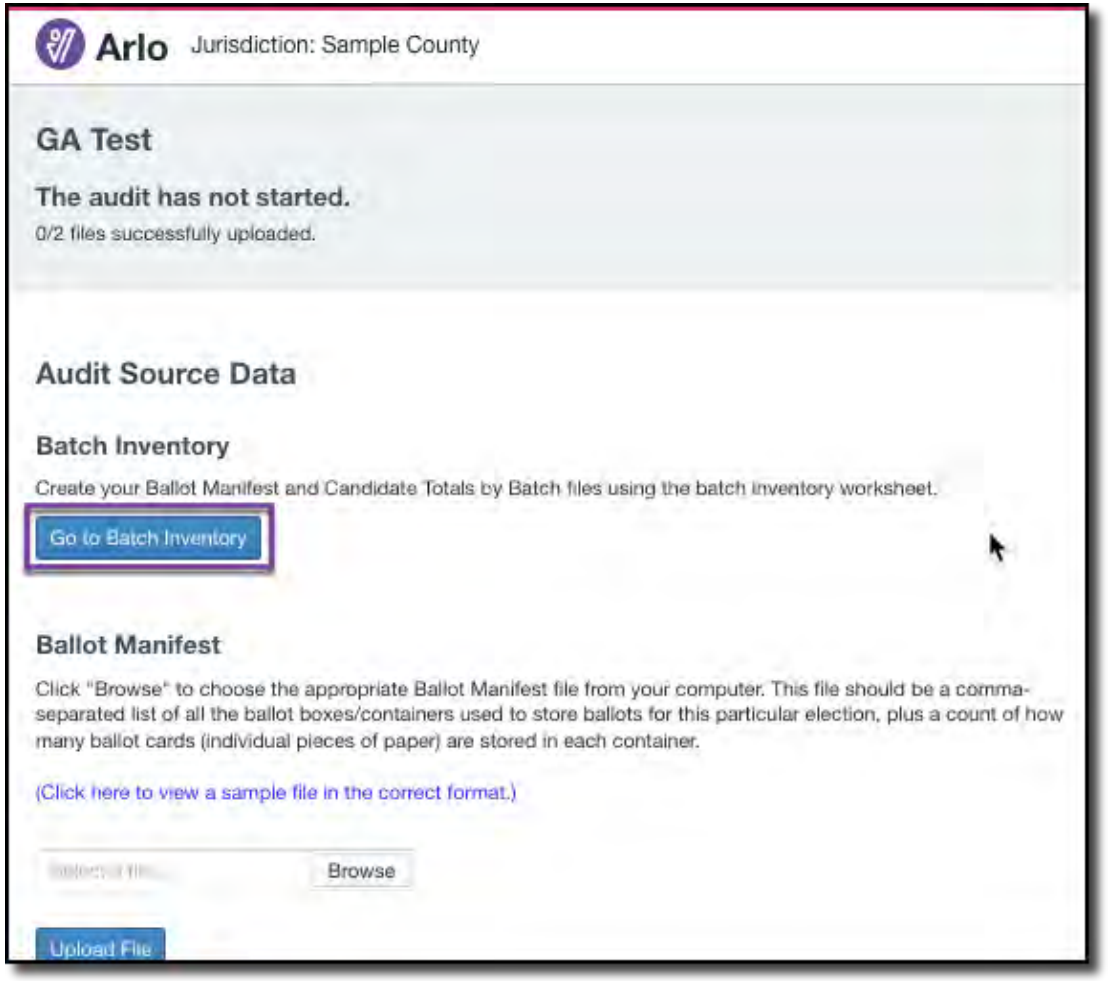


BALLOT INVENTORY TOOL
COPY TABULATOR STATUS REPORT TO USB DRIVE

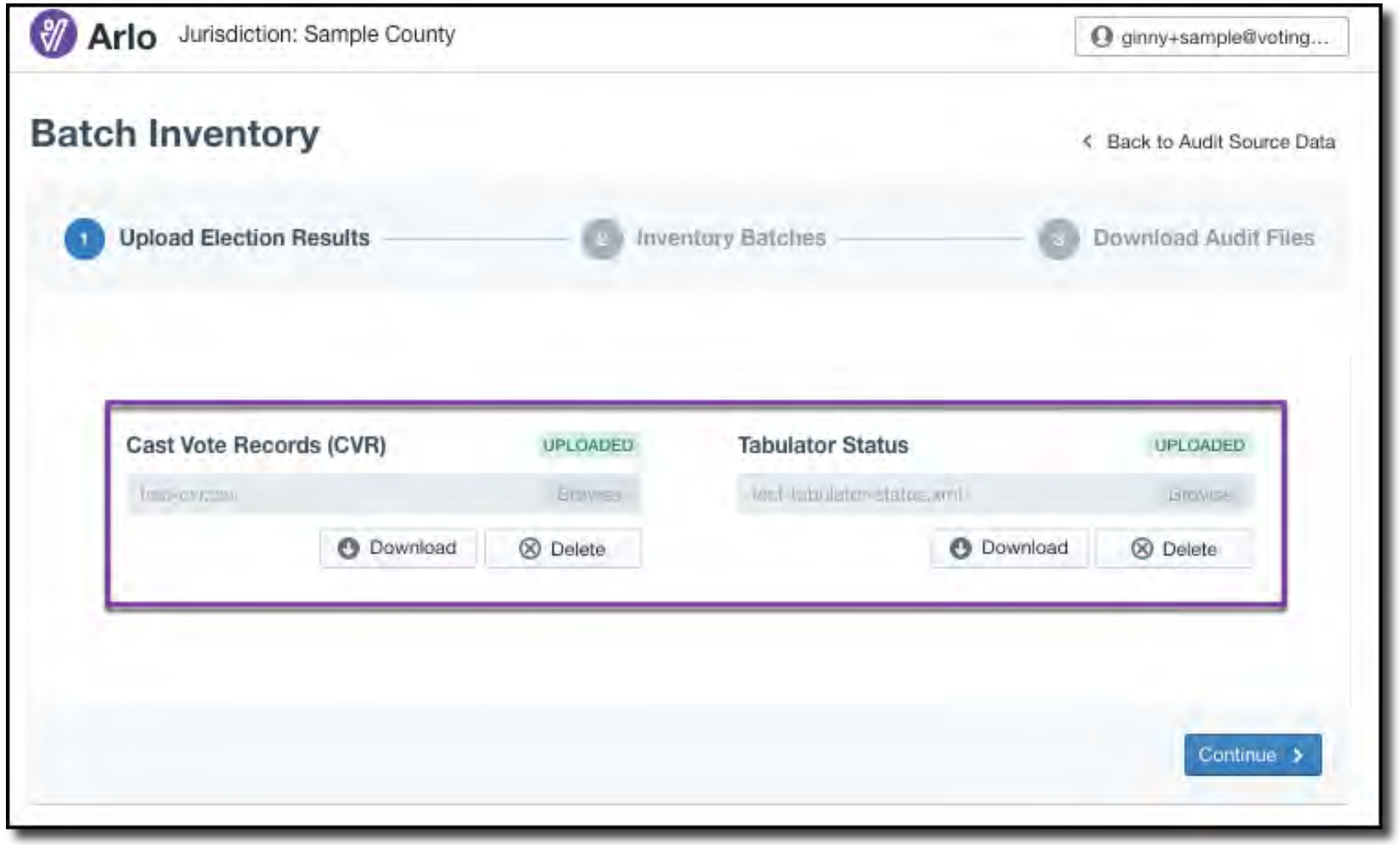
1. Open the Reports folder.
2. Open the Filtered folder.
3. Copy the Tabulator Status Report to the same USB Drive.
   Note: You need to copy the version that says "XML Document" next to the file name.



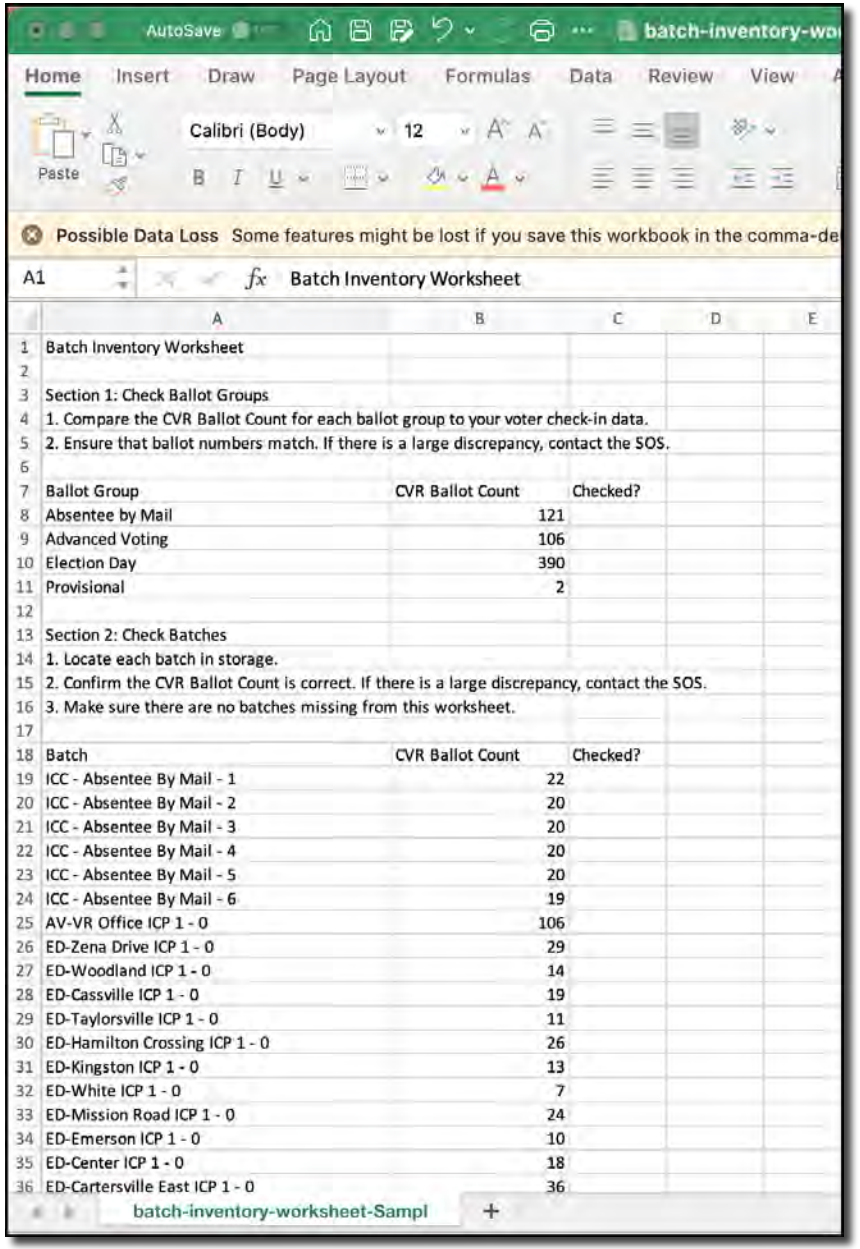
BATCH INVENTORY TOOL



BATCH INVENTORY TOOL

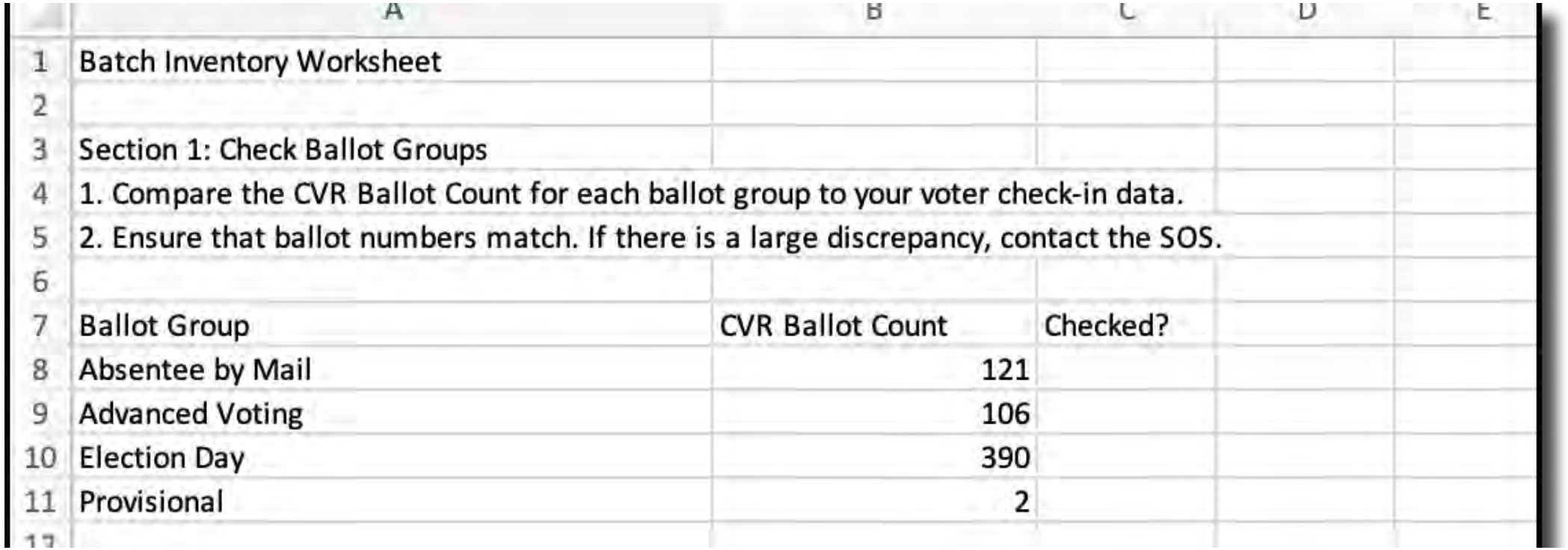


BATCH INVENTORY TOOL



	A	B	C	D	E
1	Batch Inventory Worksheet				
2					
3	Section 1: Check Ballot Groups				
4	1. Compare the CVR Ballot Count for each ballot group to your voter check-in data.				
5	2. Ensure that ballot numbers match. If there is a large discrepancy, contact the SOS.				
6					
7	Ballot Group	CVR Ballot Count	Checked?		
8	Absentee by Mail	121			
9	Advanced Voting	106			
10	Election Day	390			
11	Provisional	2			
12					
13	Section 2: Check Batches				
14	1. Locate each batch in storage.				
15	2. Confirm the CVR Ballot Count is correct. If there is a large discrepancy, contact the SOS.				
16	3. Make sure there are no batches missing from this worksheet.				
17					
18	Batch	CVR Ballot Count	Checked?		
19	ICC - Absentee By Mail - 1	22			
20	ICC - Absentee By Mail - 2	20			
21	ICC - Absentee By Mail - 3	20			
22	ICC - Absentee By Mail - 4	20			
23	ICC - Absentee By Mail - 5	20			
24	ICC - Absentee By Mail - 6	19			
25	AV-VR Office ICP 1 - 0	106			
26	ED-Zena Drive ICP 1 - 0	29			
27	ED-Woodland ICP 1 - 0	14			
28	ED-Cassville ICP 1 - 0	19			
29	ED-Taylorsville ICP 1 - 0	11			
30	ED-Hamilton Crossing ICP 1 - 0	26			
31	ED-Kingston ICP 1 - 0	13			
32	ED-White ICP 1 - 0	7			
33	ED-Mission Road ICP 1 - 0	24			
34	ED-Emerson ICP 1 - 0	10			
35	ED-Center ICP 1 - 0	18			
36	ED-Cartersville East ICP 1 - 0	36			

BATCH INVENTORY



	A	B	C	D	E
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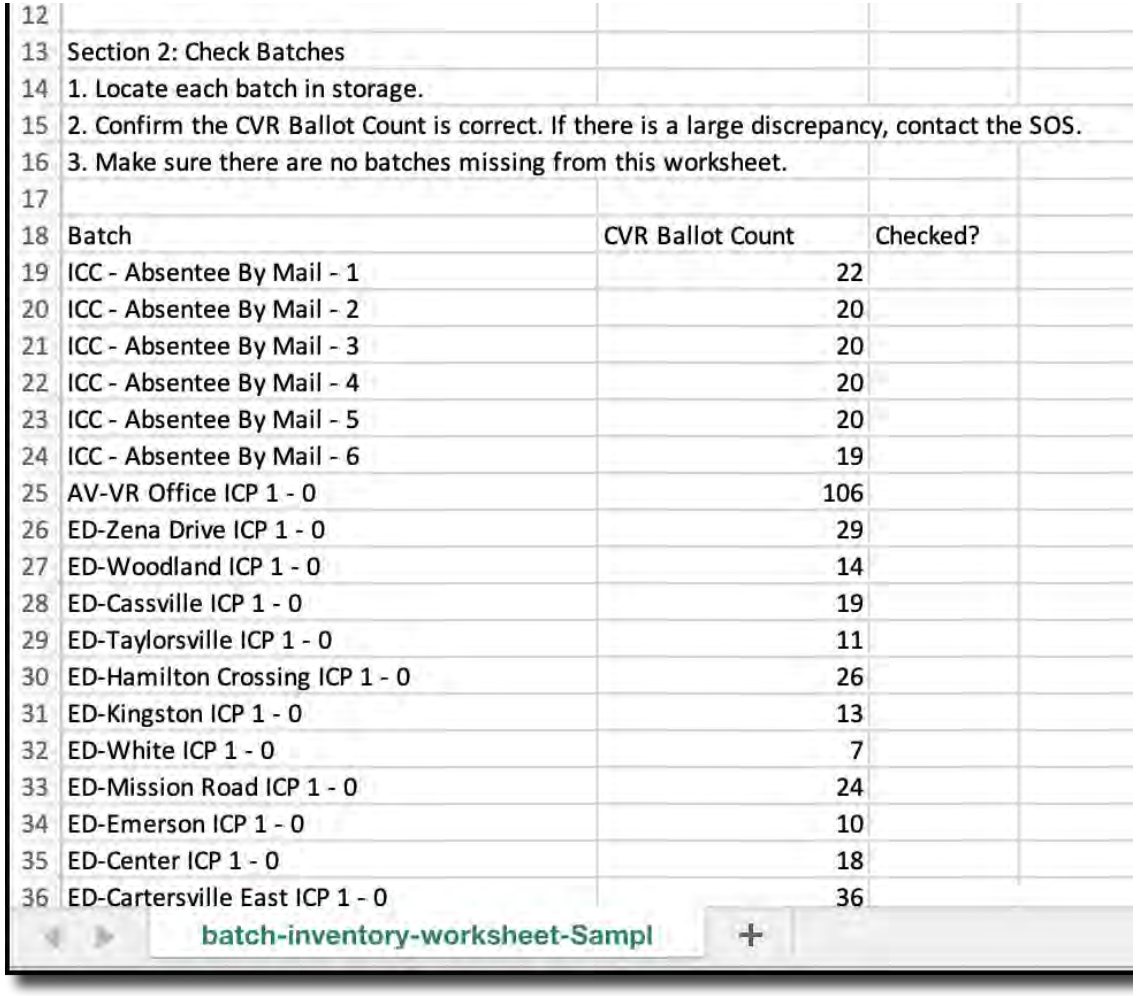
12					



12			
13	Section 2: Check Batches		
14	1. Locate each batch in storage.		
15	2. Confirm the CVR Ballot Count is correct. If there is a large discrepancy, contact the SOS.		
16	3. Make sure there are no batches missing from this worksheet.		
17			
18	Batch	CVR Ballot Count	Checked?
19	ICC - Absentee By Mail - 1	22	
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21	ICC - Absentee By Mail - 3	20	
22	ICC - Absentee By Mail - 4	20	
23	ICC - Absentee By Mail - 5	20	
24	ICC - Absentee By Mail - 6	19	
25	AV-VR Office ICP 1 - 0	106	
26	ED-Zena Drive ICP 1 - 0	29	
27	ED-Woodland ICP 1 - 0	14	
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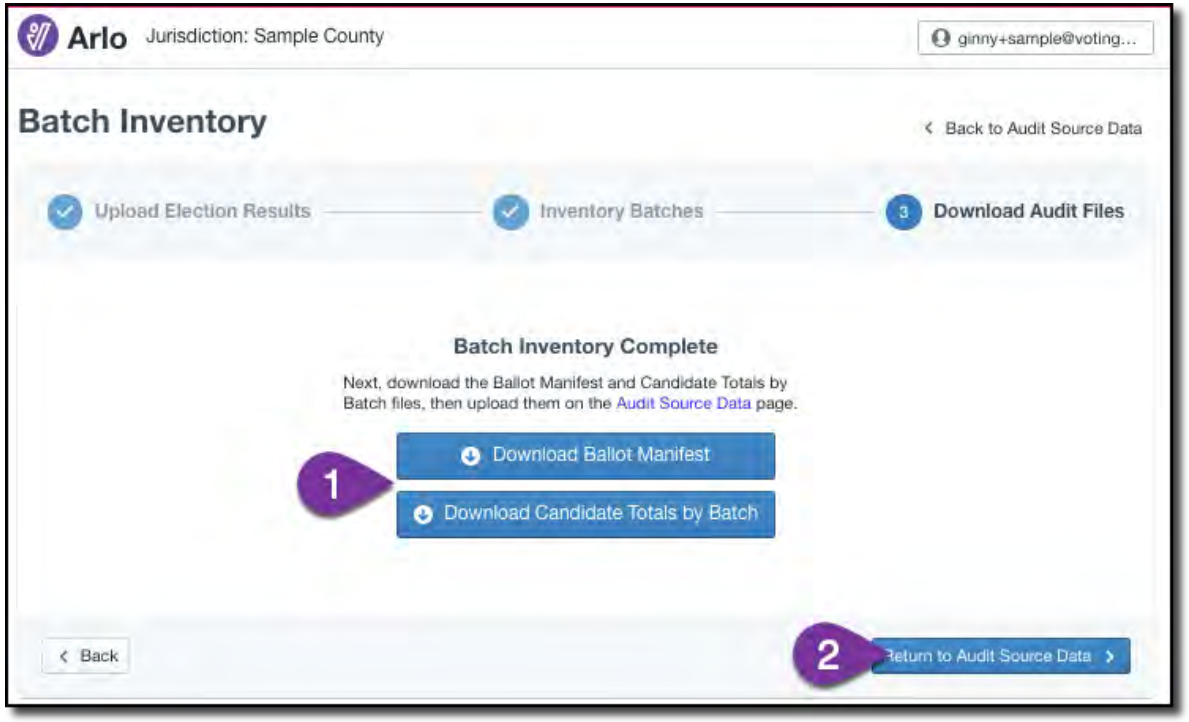
35	ED-Center ICP 1 - 0	18	
36	ED-Cartersville East ICP 1 - 0	36	

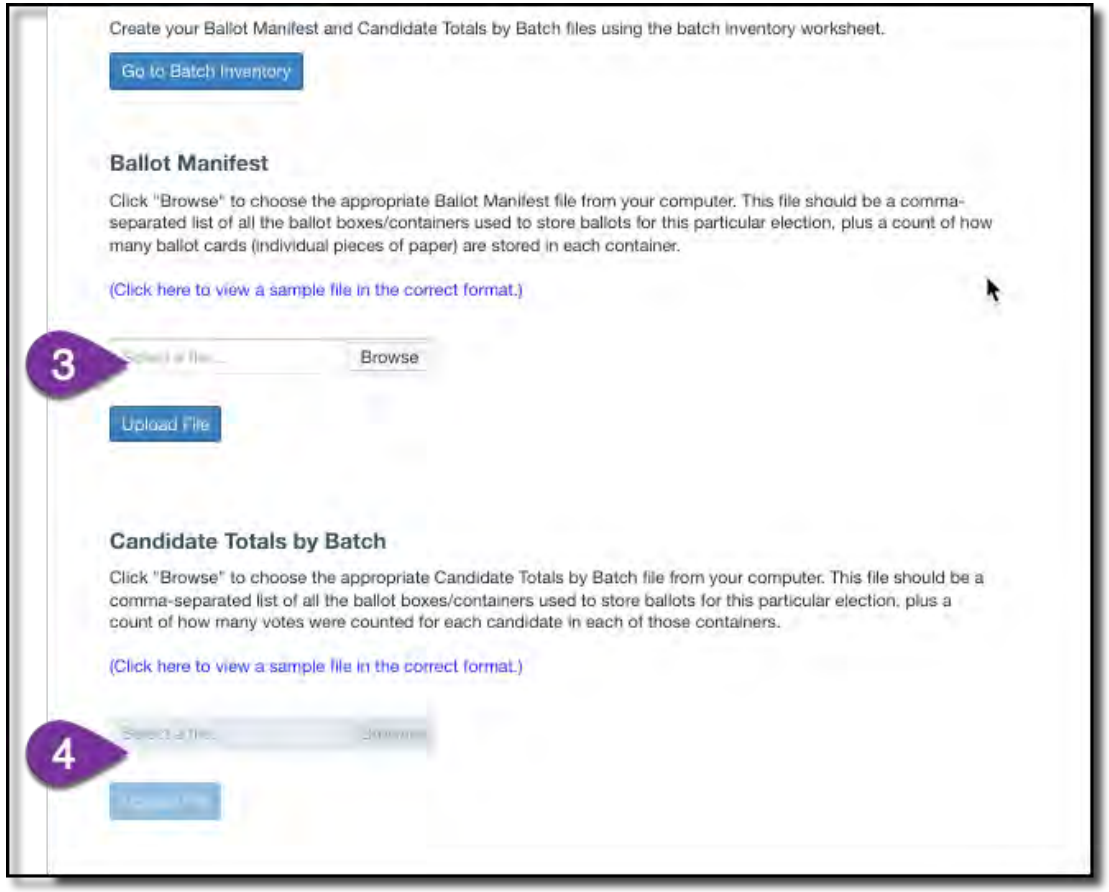
batch-inventory-worksheet-Sampl

BATCH INVENTORY

BATCH INVENTORY TOOL

DOWNLOAD & UPLOAD AUDIT FILES





LOGISTICS FOR DAY BEFORE AUDIT STARTS (NOVEMBER 16)

- Random selection of batches
  - Dice roll
- Audit launches in Arlo
- Get your batch retrieval list from Arlo

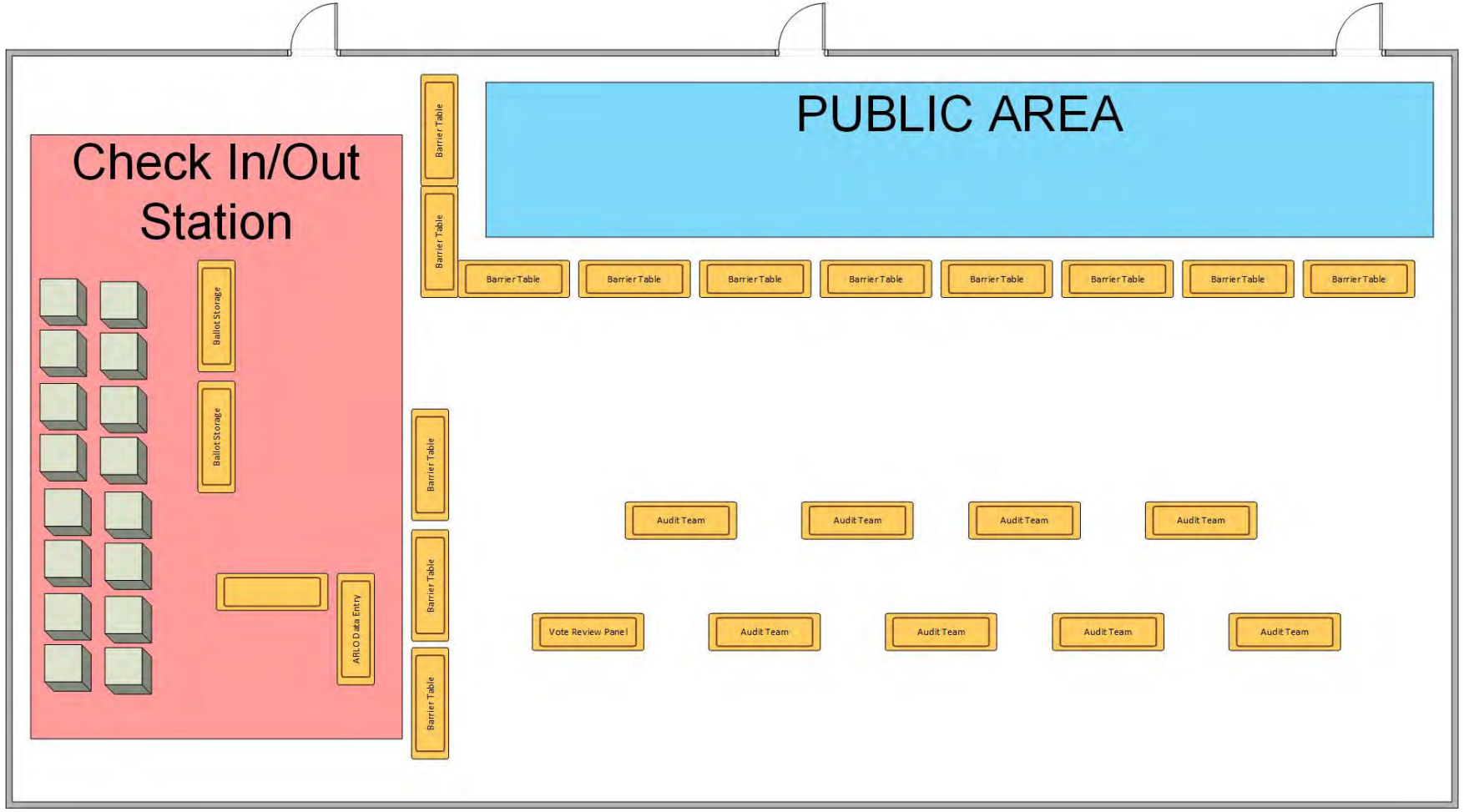
AUDIT PREPARATION
FACILITY PREPARATIONS

- Walk the facility ahead of time to ensure you will not have any surprises on the day of the audit. This is especially important if you are using an offsite facility.
- Do not transport ballots into the auditing facility before the start of the audit unless it is secure and the process is observable.
- Set up as much as you can ahead of time.
  - Tables and Chairs
  - Signage
  - Training Equipment

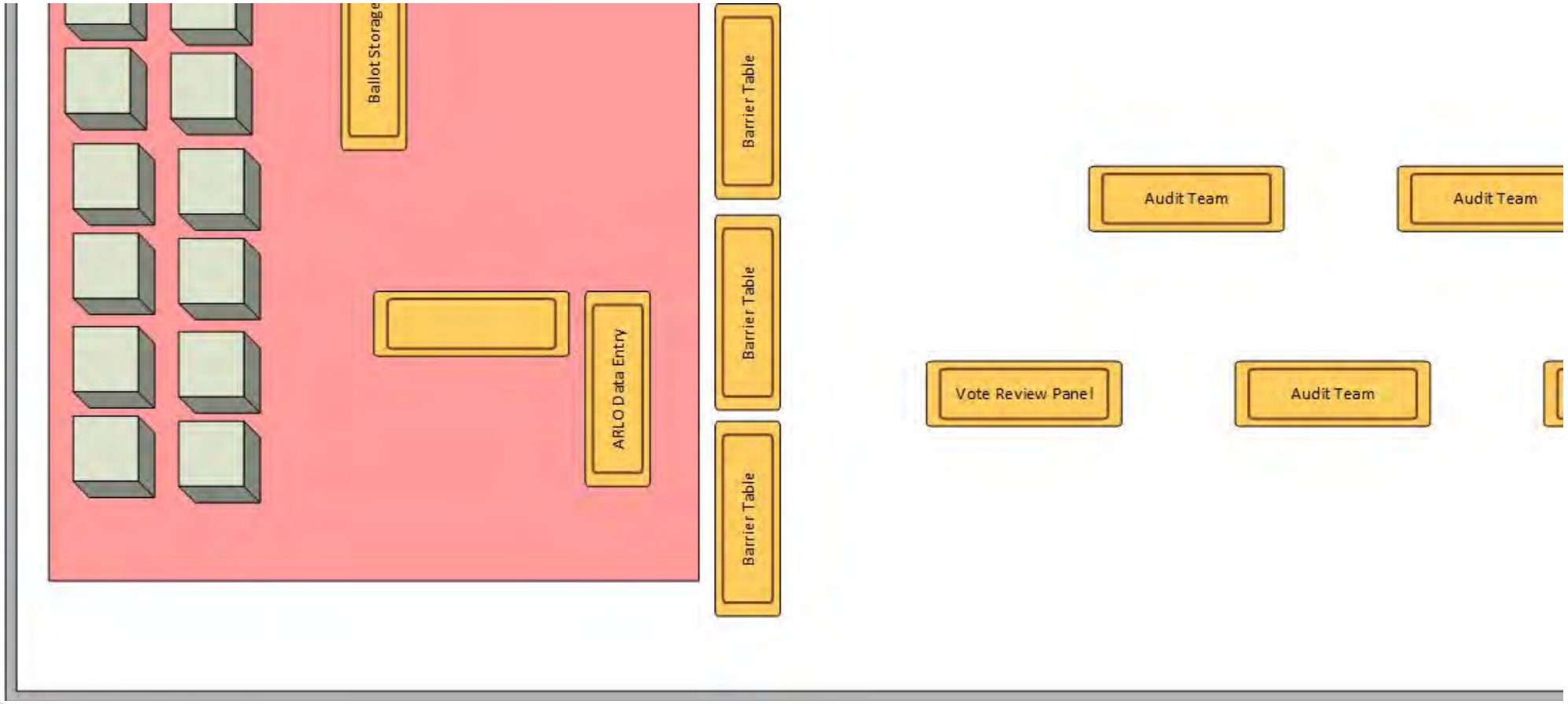
AUDIT PREPARATION
PREPARE THE FACILITY

- **Check In/Out Station** – Secure area where ballots are stored when not in use. Access should be limited to employees who need it such as the check in/out clerks and the person in charge or the audit. Official Monitors should not be allowed in this area but should be able to observe activities within it.
  - *Some counties may have to have use a separate room to secure their ballots. In this case they may not need a check in/out station in the auditing area but should ensure that the process to transfer in and out of that room is observable, and that there is a place to enter data in Arlo.*
- **Auditing Tables** – Tables where the auditors or vote review panels will sit to do their work. Tables should be spaced far enough apart to allow movement in between them and positioned in a way to make the process as observable as possible.
- **Arlo Data Entry Area** – An internet connected PC where the tally sheets will be entered into Arlo. The computer should be positioned so that Official Monitors are able to observe the data entry process.

AUDIT PREPARATION
PREPARE THE FACILITY



AUDIT PREPARATION
PREPARE THE FACILITY



GENERAL ROOM SUPPLIES

- Signage reminding monitors to sign in (provided)
- Monitor sign-in sheets (provided)
- Name tags for staff
- Tape for signs
- Pens

CHECK-IN/OUT STATION SUPPLIES

- Ballot Container Inventory Sheet (provided)
- Laptop with internet access
- Colored pens (RED)

AUDIT BOARDS SUPPLIES

- Stack labels (provided - print in color when possible)
- Attention signs (provided - print on different colored cardstock when available)
- File folders or envelopes for Vote Review Panel ballots
- Sortkwik and/or rubber fingers
- Container openers
- Container seals
- Colored pens (RED is best)
- Signs indicating Audit Board Number (e.g. Audit Board #1)

VOTE REVIEW PANEL SUPPLIES

- Vote Review Board Tally Sheet (provided)
- List of Valid Write-In Candidates for the office(provided)
- Colored pens (RED)

ON THE MORNING OF THE AUDIT

- Make sure you begin by explaining the process to all audit participants and observers in the room.
  - Ask if anyone has questions, and try to address them before you get started.

AUDITING PROCESS
BATCH SELECTION

- The check in/out clerks will have a list of batches that are included in the audit.
  - The Batch Retrieval List will be generated by Arlo after the audit begins.
  - Counties may audit more batches than this if they choose, but they must start with those included on the Batch Retrieval List.
- The check in/out clerks will select which batch is assigned to which audit team. They may also split large batches between audit teams.
- The batch will be located inside a secure container that should be sealed. Containers with ICC batches may contain multiple batches, but only one batch should be removed per audit team.

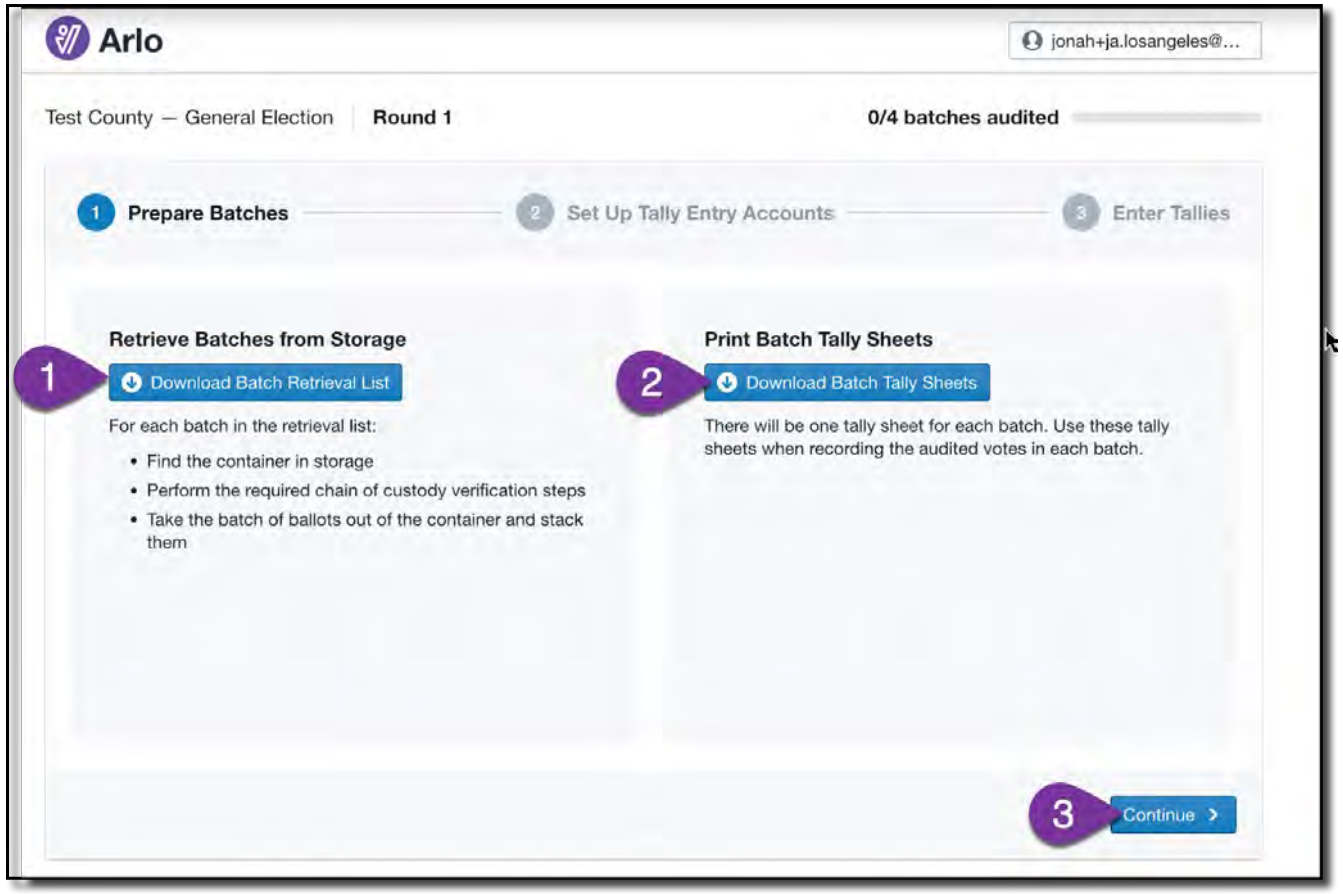
AUDITING PROCESS
CHAIN OF CUSTODY

- The check in/out clerks should refer to the appropriate documentation to verify the chain of custody of each secure container prior to removing it from the check in/out station.
- Then the check in/out clerk will transport the secure container to selected audit team.
- The audit team will verify the seal(s) on the secure container with the check in/out clerk before signing the RLA Chain of Custody Form.
  - If more than one team is involved in auditing a large batch, they should all verify the seal(s) on the secure container.
- If there was more than one batch in the in the secure container, the check in/out clerks should reseal it and record the seal number on the appropriate form before returning the container to the Library.
  - Containers should not be moved around the auditing space without being sealed.

VIDEO

Click link to play video: https://youtu.be/U3Vqs2CtQV8

BATCHES SELECTED



Audit Board Batch Tally Sheet

Batch Name: 400,0

Jurisdiction: Sample County

Audit Board: Audit Board #1

Batch Type (Optional): _____

Was the container sealed when received by the audit board? ☐ Yes

Candidates/Choices	Enter Stack Totals
yes	
no	

When work is completed, return all ballots to the ballot container and seal the container.

Was the container resealed by the audit board? ☐ Yes

x_____ x_____

(Audit Board Member) (Audit Board Member)

_____

Check-in/Out Station Steps:

☐ Recorded batch check-in

☐ Entered tallies into Arlo

_____ Initials of check-in/out station member

AFTER AN AUDIT TEAM GETS A TALLY

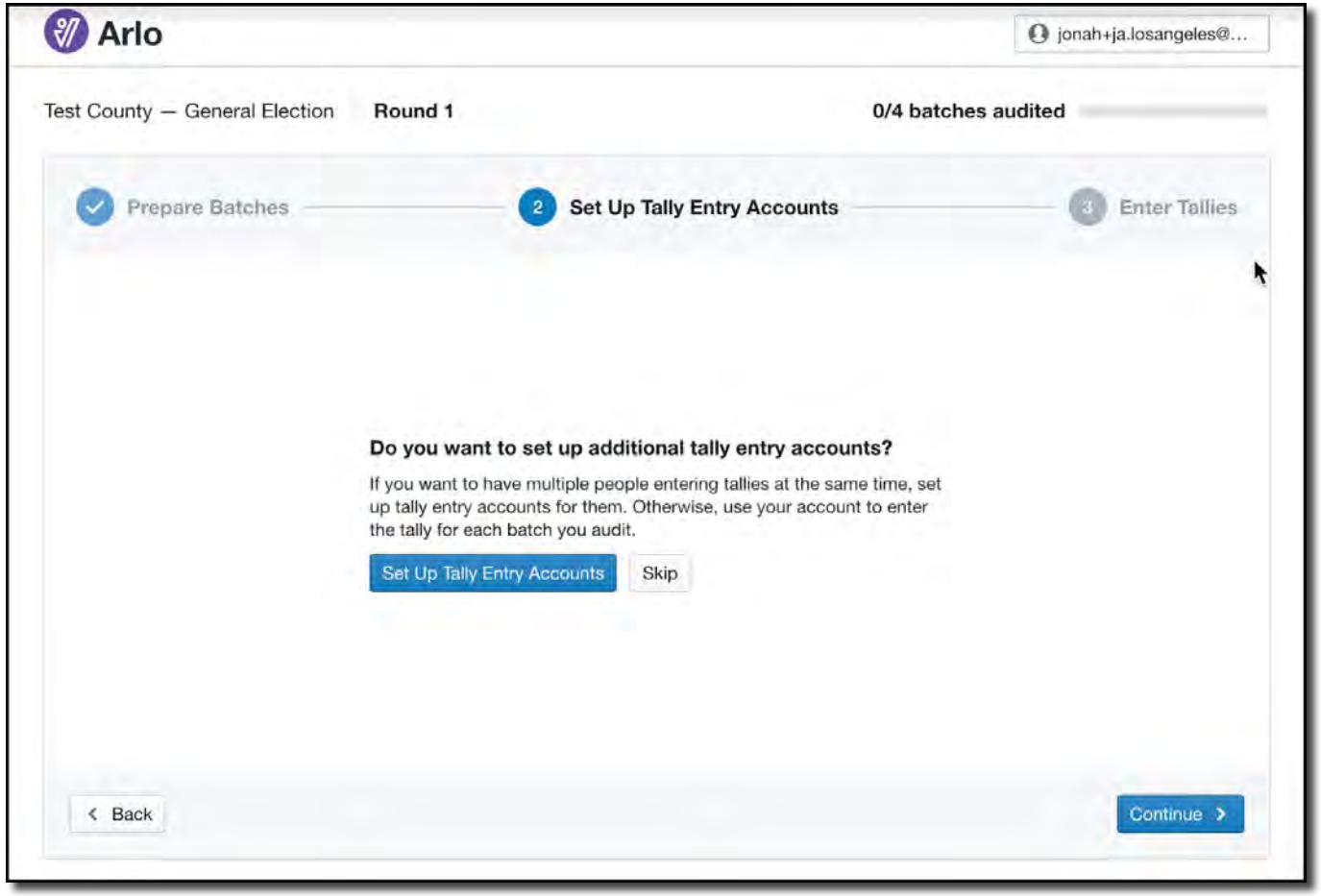
- After an audit team gets a tally for a batch, verify the TOTAL number of ballots they counted.
  - Do NOT verify the results of the batch.
- The check in/out clerk will have the total number of ballots in the batch from the ballot manifest, and they should ask the audit team, “How many ballots did you count?”
  - In the event there is a discrepancy, the election superintendent can choose to have the audit team count again.
- Once you have a tally, you can put the results of the batch in Arlo.

AFTER AN AUDIT TEAM GETS A TALLY

- Put the batch back into the sealed container, put a new seal on the batch, record the new seal number, and complete chain of custody paperwork.
- In the event that a ballot (or ballots) need to be reviewed by the Vote Review Panel, place the ballot into a sealed envelope, record the batch that the ballot belongs to, and send it to the Vote Review Panel.
- Make sure the process of returning the batch to secure storage is observable.

WHAT IF AN AUDIT BOARD TEAM MEMBER NEEDS TO STEP AWAY?

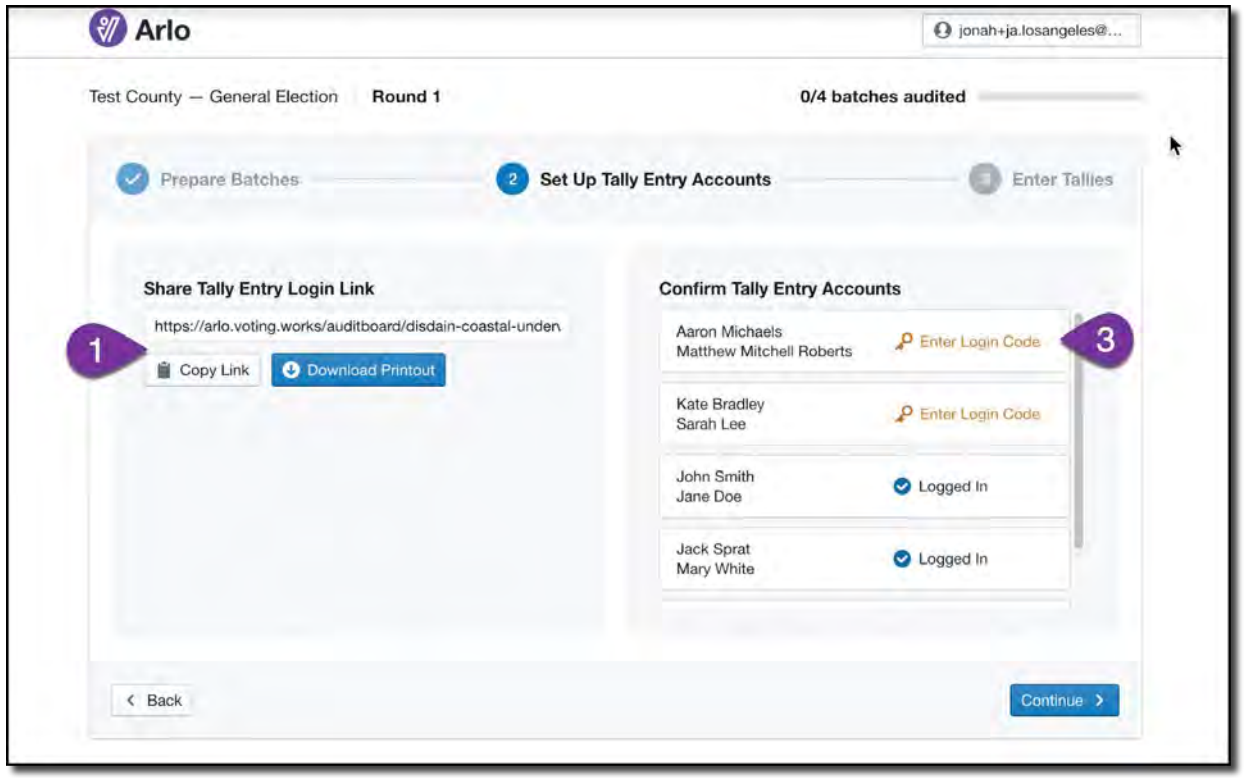
- Make sure there are always 2 people with open containers of ballots.
- The Librarian, or another designee of the election superintendent, can step in for an audit board team member.



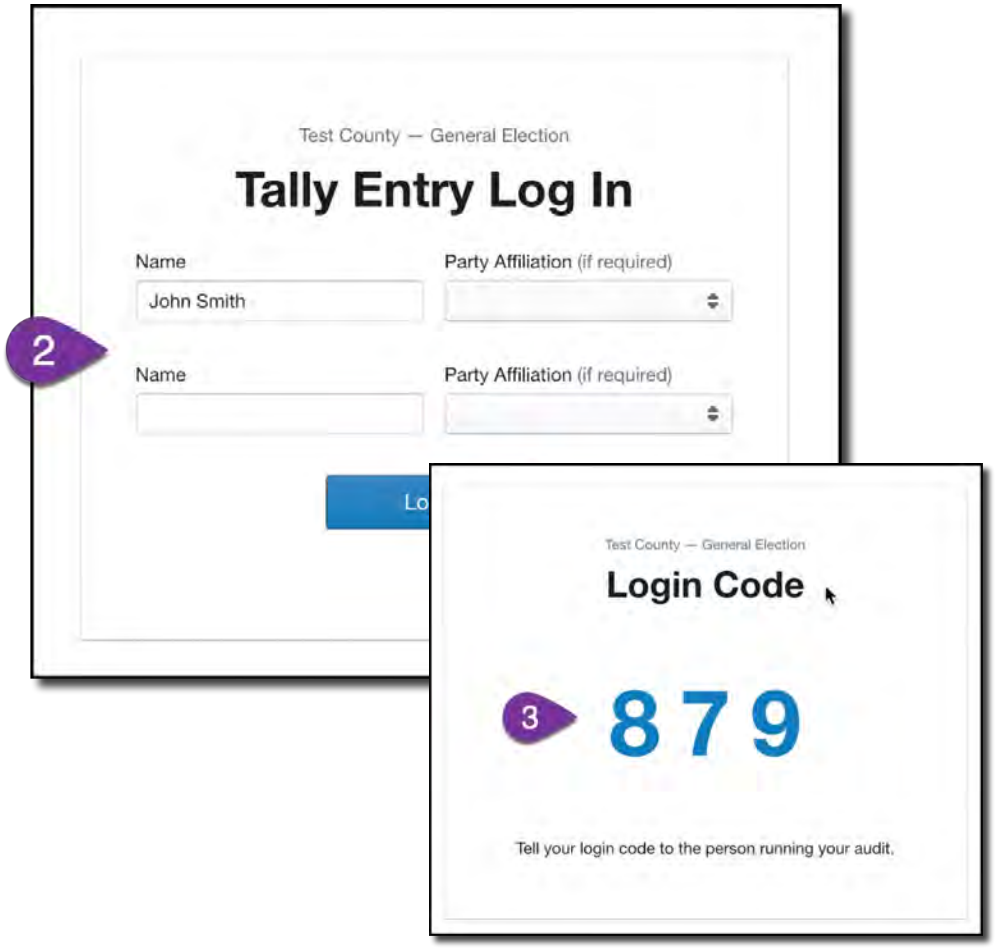
TALLY ENTRY ACCOUNTS

CREATING TALLY ENTRY ACCOUNTS

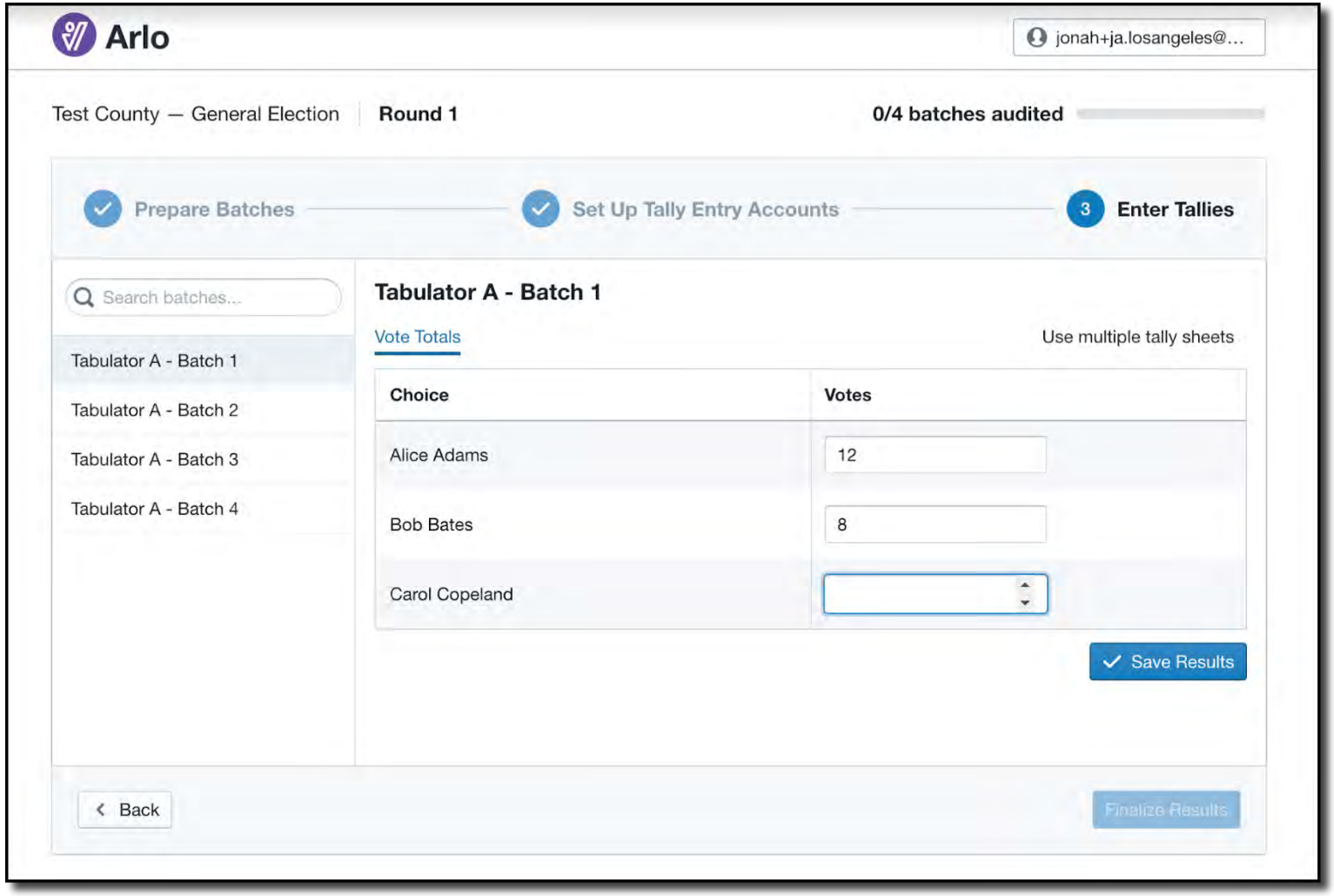
JURISDICTION MANAGER



TALLY ENTRY USER



TALLY ENTRY


Arlo
jonah+ja.losangeles@...
Test County — General Election
Round 1
0/4 batches audited
Prepare Batches
Set Up Tally Entry Accounts
3
Enter Tallies
Search batches...
Tabulator A - Batch 1
Tabulator A - Batch 2
Tabulator A - Batch 3
Tabulator A - Batch 4
Tabulator A - Batch 1
Vote Totals
Use multiple tally sheets
Choice
Votes
Alice Adams
12
Bob Bates
8
Carol Copeland
Save Results
Back
Finalize Results

THINGS TO CONSIDER WHEN PLANNING YOUR AUDIT

- When will you put your notice on your website? How else will you advertise your audit?
- Do you need to provide food or drinks to your employees during your audit?
  - Will they take lunch breaks or are they expected to stay the entire time?
  - Is there an area away from the ballots that they can eat in?
- Are you planning on livestreaming the audit?
  - If so, how will you educate the viewers on the auditing process?

THINGS TO CONSIDER WHEN PLANNING YOUR AUDIT

- Our SOS office will release statewide results once all counties are finished.
- Your office can release your county-level results as soon as you are complete.
- We will want to collect your tally sheets again this year, so be prepared to scan those and send to us after you are complete with the audit.

QUESTIONS

Thank you!

Presenter(s)

Georgia Secretary of State | Elections Division

Elections@sos.ga.gov | (404) 656-2871 | sos.ga.gov

APPENDIX 3

From: **Elections Division - Do Not Reply** ElectionsDivision-DoNotReply@sos.ga.gov
Subject: IMPORTANT AUDIT REMINDERS
Date: November 17, 2022 at 5:43 AM
To: Black, Josh jblack@sos.ga.gov, Davenport, Angela adavenport@sos.ga.gov, Deering, Amanda ADeering@sos.ga.gov, Golden, Tyrell tgolden@sos.ga.gov, Rogers, Savannah SRogers@sos.ga.gov
Cc: Evans, Blake bevans@sos.ga.gov, Harris, Jesse jharris@sos.ga.gov, Combs, Leigh lcombs@sos.ga.gov, Northen, Nicolas nnorthen@sos.ga.gov, Anglin, Rebecca RAnglin@sos.ga.gov, Virginia Vander Roest ginny@voting.works, Arlo Support rla@vx.support

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As you begin the sort, stack, and tally process today, we have a few reminders for you:

1. If the batch selected was not batched as expected, please reach out for a solution and send an email to rla@vx.support!

2. Write-in votes are sorted, sent to the Vote Review Panel for review and adjudication on the Vote Review Panel Tally Sheet (found in Firefly) but **not** entered into Arlo

3. The no vote pile does not need to be added up and put on the Batch Tally Sheet or entered into Arlo (Arlo does that math automatically based on your candidate totals). However, you may find it helpful to still count them to verify your total number of ballots in the batch.

And finally, remember, a slow methodical count, as seen in our training video ensures accuracy and high visibility for the public viewing your work. https://youtu.be/pjcGXjvpEDs.

You all did an excellent job preparing for the audit, we know you're well prepared for counting today, but if you have any questions, please do not hesitate to reach out to us at rla@vx.support!

Virginia Vander Roest
Election Implementation Manager, VotingWorks
(269) 215-0215
Email: rla@vx.support

Sent on behalf of
Georgia Secretary of State
Elections Division
Main Office: 404-656-2871
sos.ga.gov

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This message has been checked by Libraesva ESG and is found to be clean.
Mark it as spam
Blacklist sender

APPENDIX 4

IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF GEORGIA
ATLANTA DIVISION

DONNA CURLING, ET AL., **Plaintiffs,** **v.** **BRAD RAFFENSPERGER, ET AL.,** **Defendants.**	**Civil Action No. 1:17-CV-2989-AT**

DECLARATION OF AILEEN NAKAMURA

AILEEN NAKAMURA declares, under penalty of perjury, pursuant to 28 U.S.C. §1746, that the following is true and correct:

1. My name is Aileen Nakamura. I am over 18 years old.
2. I have personal knowledge of all facts stated in this declaration, and if called to testify, I could and would testify competently thereto.
3. I am a registered voter residing in Sandy Springs in Fulton County, Georgia.
4. On November 17th, 2022, I was a Gwinnett County audit monitor for the Libertarian party.
5. The audit began at 9am, but due to heavy traffic I did not arrive until 9:30. At this time the 18 audit teams had finished counting the first batch and was moving onto the 2nd batch.

6. The Gwinnett Elections personnel staff were extremely helpful and transparent. Grayson Davis, who in charge of Elections and the warehouse, told me they were counting five batches: two Advance in Person (AIP), two Election Day (ED), and one Absentee by Mail (ABM).
7. When I asked how many ballots each batch was, he looked them up. The breakdown he relayed was:

   AIP Mountain Park 2B – 1,859

   AIP Bogan – about 6,338

   ED Rockbridge 44B – 289

   ED Goodwinns 070B – 728

   ABM batch was 48-50 pages, which means 24-25 ballots. (Gwinnett has two page ballots due to English/Spanish dual language ballots.)
8. There were about eight audit monitors there – I believe three were from the Carter Center, and the rest were appointed by parties. We were free to roam the area and observe everything that happened. However, we were not given any instructions or audit guidelines to understand the entire process of what was happening.
9. Photography and videotaping was allowed while in the public areas as by law. Here are two photos of the overall setup of the room in which the audit was performed:

10. While I observed different audit teams counting their stacks, I noticed that they did not have any written instructions they were following, and that some of them seemed to be creating processes as they went. I observed one team where one person was counting a stack of ballots silently, while her partner observed her count. At one point it was clear they both became confused and started counting over again. It was at this point that they started counting and placing the stacks in groups of 10 to make it easier to keep track. I felt it would be easier for teams had they had clear written instructions to follow.
11. With 18 audit teams and eight 'roving' audit monitors, there was no way the observers could watch every audit team all the time. I did notice that each team I observed seemed to have their own method of checking that the numbers were correct.
12. I was also surprised that there did not seem to be any checking of the data being entered into the Arlo system. There were two computers set up for this purpose on a separate table, but only one person entering the information for each, with no one checking their work.
13. The table with computers was in clear view of observers, but it was impossible to see what was actually being entered unless one stood right over the shoulder of the person doing the data entry. I did try to take a video of the data being entered from the public area, but was not able to get a clear shot of

the words on the screen, even though I was only a few feet away from the data entry person.

14. Due to the relatively small number of ballots which had to be counted, the entire process of counting all five batches was finished by about 1 p.m.

15. Around 5 p.m., we received an email from Zach Manifold, the Gwinnett Elections Supervisor, that they received word from the State that they would have to recount one batch the following day, and the recount would commence at 9 a.m. I asked Mr. Manifold which batch they would be recounting and why, and he replied, “AIP at Bogan. One went up ten and one down ten so it appears one of the teams probably put a stack in the wrong pile while tallying.”

16. It was clear that all of us observers missed this large error. I am unsure whether it was a counting error or a data input error.

17. I was not able to attend the recount the following day, but according to Mr. Manifold and Mr. Davis, they had 7 audit teams performing the recount of the batch of 6,338 ballots from Bogan. It took from 9 am until about 12:20 for them to finish. The final report I received via email was that, "They just finished and it did end up correcting. I think the entire batch was only off by 1 and I’m sure that’s human error versus a machine count."

18. The basis for determining whether a counting discrepancy was acceptable has not been explained to monitors. I am unaware of how smaller discrepancies

were handled in other counties, or whether the discrepancies were investigated. The Secretary of State materials I read in advance of attending the audit indicated that some level of count discrepancy was expected and acceptable. That is confusing to me, particularly given that the rationale was not explained.

Executed on this date, December 5th, 2022.

Aileen Nakamura

APPENDIX 5

IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF GEORGIA
ATLANTA DIVISION

DONNA CURLING, ET AL., **Plaintiffs,** **v.** **BRAD RAFFENSPERGER, ET AL.,** **Defendants.**	**Civil Action No. 1:17-CV-2989-AT**

DECLARATION OF B. JOY WASSON

B. JOY WASSON declares, under penalty of perjury, pursuant to 28 U.S.C. §1746, that the following is true and correct:

1. My name is B. Joy Wasson.

2. I am over the age of 18 and competent to testify if called on to do so.

3. I am a registered voter in DeKalb County, Georgia.

4. I observed Georgia's "Statewide Risk Limiting Audit" of the November 2022 General Election in Fulton County on November 17, 2022 as an appointee of the Libertarian Party.

5. On that day I arrived at the Georgia International Convention Center, the site of the audit, a little after 8a.m. I checked in and was given a badge by LaShondra who instructed me to sit in the public observation area until they announced the start of the audit.

6. There was signage in front of the public observation area saying "NO CELL PHONES ALLOWED BEYOND THIS POINT." I stepped back towards the entrance to the huge room, well outside the area where phones were said to be disallowed to take a couple of photographs. LaShondra came over and told me I was not allowed to take any photographs. She later confirmed to me that I was not allowed to take any photographs in the entire room, even before the signage that said "beyond this point."

7. I was told there were no Voting Works representatives present. Most of the workers were wearing Fulton Votes shirts but none had visible badges.

8. It was announced at 8:41 that they were starting with a batch of Advance Voting ballots. Instructions were given to the audit workers and paper was handed out to them. A

cardboard box said to be from Johns Creek Environmental was untaped and taken to the first table where stacks of ballots began being handed to 17 teams of 2 sitting at rows of numbered tables. A few extra workers were sitting at tables. We observers were allowed to walk around the outside of the metal barricades surrounding the tables of audit teams so we could see most of the workers fairly well, but not ballots themselves.

9. There were additional staff along the wall where there was a laptop for inputting the data. It appeared that one worker was doing the input alone and we were not able to see what she was typing nor what she was typing from.

10. Around 9:20am workers were finishing up with that first batch and materials were being collected. Around 9:30 they held up a 2nd box, showing it was sealed. They pulled the tape off, opened it and started passing out the stacks of ballots. At 9:35 they announced to the workers that they could begin counting the ballots. They stated that this was an Election Day batch from Roswell RW02 of around 800 and they finished with the counting in about 15 minutes.

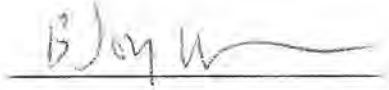
11. They had 2 more boxes. They explained later they didn't need to open the 4th because they retrieved the batch they needed from the 3rd box. Those last two boxes they said contained the batch of UOCAVA ballots (from uniformed and overseas voters). There were eight ballots in the 3rd batch.

12. They were done a little after 10am. At 10:15 Dominick gave us these total numbers of ballots counted, minus undervotes & non-qualified write-ins:
    Johns Creek Environmental: 2302
    Advance voting RW02: 847
    UOCAVA batch: 8

13. I asked him if there were any discrepancies and he said there were no discrepancies to report. He said they had no other details to give us. The audit was concluded for the public without any announcement of the vote tallies. Therefore I do not know whether there were discrepancies in the vote count, nor whether any discrepancies were investigated.

14. On December 4, 2022, I downloaded data from the Georgia SOS website, including the audit summary, ballot manifests and machine batch tallies. I saw no link on the website to the hand count tally sheets or other publicly available data from the audit. I don't have any way of knowing what the audit hand counts were that were intended to be input into the Arlo system unless I somehow obtain the hand tally sheets that were completed that day by the workers.

Executed on this date, December 5, 2022.



B. Joy Wasson

APPENDIX 6

Subject: The Buzz Post - Statewide Risk Limiting Audit Following December 6 Runoff
Date: Thursday, December 1, 2022 at 1:00:45 PM Eastern Standard Time
From: DoNotReply@sos.ga.gov
To: DoNotReply@sos.ga.gov

A new discussion has
been posted in The Buzz by Evans, Blake on 12/1/2022 12:51 PM

As was stated in the Official Election Bulletin, the statewide Risk-Limiting Audit following the December 6, 2022 Runoff election is recommended by members of the State Election Board, and that recommendation is supported by Secretary Raffensperger and me.

While the hope is that all counties will choose to participate in the audit because of the value that audits add to election outcomes, there is no law or SEB rule currently in place that mandates this audit.

The reason that I chose to support the recommendation for an audit is because I believe that the benefit the audit would bring is greater than the cost. From my experience, jurisdictions that conduct frequent audits are often considered the best at conducting high-integrity elections. I believe that Georgia is headed in the direction of mandated audits following every election.

I recognize that there is a cost to the audit, and I recognize that people are tired. However, after considering the pros and cons of an audit, I decided to support the SEB's recommendation because I believe that an audit will bring additional public confidence to the outcome of the election. My hope is that all counties choose to participate.

Thank you for all you are doing to serve the voters of Georgia. You are representating your counties and our state very well.

Blake Evans, Elections Director

If you would like to opt out of receiving email notifications for this
discussion, click here.

--
This message has been checked by Libraesva ESG and is found to be clean.
Mark it as spam
Blacklist sender

APPENDIX 7

Examine DVSOrder issue

In [1]:
```
import math
import numpy as np
import scipy as sp
import pandas as pd
```

In [2]:
```
# from https://gist.githubusercontent.com/jhalderm/d813e5ef35ef0aa45e114cc4e401
def generate_sequence(p):
    return [sum([5,0,8,3,2,6,1,9,4,7][864803*n//10**p[i]%10]*10**i for i in ran
        for n in range(1000000)]
icp_sequence = generate_sequence([2,3,1,5,0,4])
ice_sequence = generate_sequence([1,5,0,4,2,3])
```

Heard county

In [3]:
```
fn = './Data/CVRs/Heard CVR_Export_20221115201056.xlsx'
```

In [4]:
```
cvr = pd.read_excel(fn, skiprows=3)
```

In [5]:
```
cvr.head()
```

Out[5]:

	CvrNumber	TabulatorNum	BatchId	RecordId	ImprintedId	CountingGroup	PrecinctPortion
0	1	160	1	1	160-1-1	Provisional	004-Centralhatchee
1	2	160	1	2	160-1-2	Provisional	002-Enon Grove
2	3	160	1	3	160-1-3	Provisional	006-Ephesus
3	4	150	15	1	150-15-1	Absentee by Mail	004-Centralhatchee
4	5	150	15	2	150-15-2	Absentee by Mail	004-Centralhatchee

5 rows × 64 columns

In [6]:
```
# extract the record IDs
ed = cvr[cvr.CountingGroup.isin(['Election Day','Advanced Voting'])]
len(ed)
```

Out[6]:
```
4129
```

In [7]:
```
tab_batch = ed[['TabulatorNum','BatchId']].value_counts().reset_index(name='cou
tab_batch
```

Out[7]:

	TabulatorNum	BatchId	count
0	70	0	1730
1	10	0	639
2	40	0	504
3	50	0	477
4	30	0	340
5	60	0	226
6	20	0	213

In [8]:
```
file_stem = './Data/CVRs/'
county = 'heard'
orders = {}
mn = {}
mx = {}
with pd.ExcelWriter(file_stem + county + '.xlsx') as write_xl:
    for tn in sorted(tab_batch['TabulatorNum']):
        dat = ed[ed['TabulatorNum']==tn].copy()
        orders[tn] =  [np.where(icp_sequence == d)[0][0] for d in np.array(dat[
        dat['sort_order'] = orders[tn]
        dat = dat.sort_values(by=['sort_order'])
        dat.to_excel(write_xl, sheet_name=str(tn))
        n = len(dat)
        mn[tn]= np.min(orders[tn])
        mx[tn] = np.max(orders[tn])
        m = mx[tn] - mn[tn] + 1
        print(f'{tn=} {n=} {m=} {n-m == 0} 1st ballot index: {mn[tn]} 1st ballo
              f' last ballot index: {mx[tn]} last ballot: {icp_sequence[mx[tn]]}
```

```
tn=10 n=639 m=639 True 1st ballot index: 313417 1st ballot: 107604 last ballot
index: 314055 last ballot: 569110
tn=20 n=213 m=213 True 1st ballot index: 565841 1st ballot: 737823 last ballot
index: 566053 last ballot: 373686
tn=30 n=340 m=340 True 1st ballot index: 665148 1st ballot: 427264 last ballot
index: 665487 last ballot: 600125
tn=40 n=504 m=504 True 1st ballot index: 954563 1st ballot: 277415 last ballot
index: 955066 last ballot: 247707
tn=50 n=477 m=477 True 1st ballot index: 850145 1st ballot: 267312 last ballot
index: 850621 last ballot: 736181
tn=60 n=226 m=226 True 1st ballot index: 526639 1st ballot: 497090 last ballot
index: 526864 last ballot: 186799
tn=70 n=1730 m=1730 True 1st ballot index: 719550 1st ballot: 757641 last ball
ot index: 721279 last ballot: 298335
```

In [9]:
```
orders_h, mn_h, mx_h= orders.copy(), mn.copy(), mx.copy()
```

Coffee county

In [10]:
```
fn = './Data/CVRs/Coffee_CVR_Export_.csv'
cvr = pd.read_csv(fn, skiprows=3, low_memory=False)
```

In [11]:
```
cvr.head()
```

Out[11]:

	CvrNumber	TabulatorNum	BatchId	RecordId	ImprintedId	CountingGroup	PrecinctPortion
0	1	71	0	217817	NaN	Advance Voting	128-Douglas
1	2	71	0	833733	NaN	Advance Voting	102-Douglas
2	3	71	0	5428	NaN	Advance Voting	104-Broxton
3	4	71	0	940432	NaN	Advance Voting	130-Douglas
4	5	71	0	834162	NaN	Advance Voting	126-Nicholls

5 rows × 72 columns

In [12]:
```
# extract the record IDs
ed = cvr[cvr.CountingGroup.isin(['Election Day','Advanced Voting'])]
len(ed)
```

Out[12]:
```
4538
```

In [13]:
```
tab_batch = ed[['TabulatorNum','BatchId']].value_counts().reset_index(name='cou
tab_batch
```

Out[13]:

	TabulatorNum	BatchId	count
0	10	0	911
1	11	0	839
2	40	0	664
3	20	0	563
4	50	0	549
5	12	0	509
6	60	0	365
7	30	0	138

In [14]:
```
file_stem = './Data/CVRs/'
county = 'coffee'
orders = {}
mn = {}
mx = {}
with pd.ExcelWriter(file_stem + county + '.xlsx') as write_xl:
    for tn in sorted(tab_batch['TabulatorNum']):
        dat = ed[ed['TabulatorNum']==tn].copy()
        orders[tn] =  [np.where(icp_sequence == d)[0][0] for d in np.array(dat[
        dat['sort_order'] = orders[tn]
        dat = dat.sort_values(by=['sort_order'])
        dat.to_excel(write_xl, sheet_name=str(tn))
        n = len(dat)
```

```
        mn[tn]= np.min(orders[tn])
        mx[tn] = np.max(orders[tn])
        m = mx[tn] - mn[tn] + 1
        print(f'{tn=} {n=} {m=} {n-m == 0} 1st ballot index: {mn[tn]} 1st ballo
             f' last ballot index: {mx[tn]} last ballot: {icp_sequence[mx[tn]]}
```

```
tn=10 n=911 m=911 True 1st ballot index: 717213 1st ballot: 677325 last ballot
index: 718123 last ballot: 877129
tn=11 n=839 m=839 True 1st ballot index: 470684 1st ballot: 387668 last ballot
index: 471522 last ballot: 211150
tn=12 n=509 m=509 True 1st ballot index: 648380 1st ballot: 157270 last ballot
index: 648888 last ballot: 428175
tn=20 n=563 m=563 True 1st ballot index: 998410 1st ballot: 157338 last ballot
index: 998972 last ballot: 417086
tn=30 n=138 m=138 True 1st ballot index: 27730 1st ballot: 457790 last ballot
index: 27867 last ballot: 102568
tn=40 n=664 m=664 True 1st ballot index: 317426 1st ballot: 647995 last ballot
index: 318089 last ballot: 893102
tn=50 n=549 m=549 True 1st ballot index: 201351 1st ballot: 237644 last ballot
index: 201899 last ballot: 194754
tn=60 n=365 m=365 True 1st ballot index: 829109 1st ballot: 697856 last ballot
index: 829473 last ballot: 379044
```

In [ ]: