

**Rule 25. Post-election audit**

25.1 Definitions. As used in this rule, unless stated otherwise:

25.1.1 “Audit Center” means the page or pages of the Secretary of State’s website devoted to risk-limiting audits.

25.1.2 “Ballot cards” means the individual pieces of paper that together constitute a single ballot containing all of the contests an elector is eligible to vote. For example, a ballot consisting of a single piece of paper with content printed on the front or the front and back contains one ballot card, and a ballot consisting of two pieces of paper with content printed on the front and back of the first page and the front or front and back of the second page contains two ballot cards.

25.1.3 “Ballot polling audit” means a type of risk-limiting audit in which the audit board examines and reports to the Secretary of State voter markings on randomly selected ballot cards seeking strong evidence that the reported tabulation outcome is correct.

25.1.4 “Comparison audit” means a type of risk-limiting audit in which the audit board examines and reports to the Secretary of State voter markings on randomly selected ballot cards, then compares them to the voting system’s tabulation as reflected in the corresponding cast vote records.

25.1.5 “Reported tabulation outcome” means the presumed winning and losing candidates or voting choices of a ballot contest as reflected in preliminary results.

25.1.6 “Risk limit” means the largest statistical probability that an incorrect reported tabulation outcome is not detected and corrected in a risk-limiting audit.

25.1.7 “Risk-limiting audit” or “RLA” means a post-election audit of votes on paper ballot cards conducted in accordance with section 1-7-515, C.R.S., and Rule 25.2, which has a pre-specified minimum chance of requiring a full hand count if the outcome of a full hand count would differ from the reported tabulation outcome.

25.1.8 “RLA tabulation” means the tabulation of all in-person and accepted mail ballots cast by electors registered in the county, and any accepted

provisional and property owner ballots that the county opts to include on the ninth day after election day.

25.1.9 “RLA Tool” means the software and user interfaces provided by the Secretary of State in order to conduct RLAs.

25.1.10 “Target contest” means a contest selected by the Secretary of State for a risk-limiting audit. The target contest with the closest diluted margin determines the number of ballot cards that must be examined during the RLA.

25.2 Risk limiting audit. The designated election official must conduct a risk-limiting audit in accordance with section 1-7-515, C.R.S., and this Rule.

#### 25.2.1 RLA methods

- (a) Counties that use a voting system capable of exporting CVRs must conduct a comparison audit.
- (b) Counties that use a voting system incapable of exporting CVRs must conduct a ballot polling audit.

#### 25.2.2 Preparing for the audit

- (a) Risk limit. No later than 32 days before election day, the Secretary of State will establish and publish on the Audit Center the risk limits that will apply in RLAs for that election. The Secretary of State may establish different risk limits for comparison audits and ballot polling audits, and for audits of statewide and countywide contests. In comparison audits the risk limit will not exceed five percent for statewide contests, and ten percent for countywide contests.
- (b) Practice period. Upon completion of the logic and accuracy test, counties may practice conducting the audit. The county must, at a minimum, hash and upload the ballot manifest and CVR file from the logic and accuracy test to the RLA software.
- (c) Audit board. No later than 15 days before election day, the designated election official must appoint audit board members to conduct the risk-limiting audit. The audit board must consist of electors nominated by the major political party county chairpersons. The designated election official must give written notice to the county chairpersons of their obligation to nominate audit board

members and may designate appropriately affiliated electors as audit board members if one or both county chairpersons fail to do so in a timely manner.

- (1) At least two canvass board members must observe at least the first round of the RLA, and members of the canvass board may serve as members of the audit board. The designated election official, members of his or her staff, and other duly appointed election judges may assist the audit board in conducting the audit. Unless given permission by the Department of State, the audit board must not consist of county clerk staff or individuals who participated in ballot resolution or adjudication during the election being audited. Each member of the audit board must take the election judge oath.
  - (2) If the Secretary of State randomly selects five or fewer ballots for any audit round after the first, the designated election official may appoint as the audit board members of staff of different party affiliations to conduct and sign off on the audit round in question. The designated election official must get approval from the Secretary of State before appointing staff as the audit board. The designated election official may not appoint themselves to conduct any audit round.
- (d) Sample size estimates. Upon completion of tabulation on election night, counties are required to export an initial CVR export from their voting system and hash and upload the export and hash value to the RLA tool. Counties are not required to upload a ballot manifest to the RLA tool for the purposes of creating sample size estimates.
- (1) The Department of State will use the election night CVRs to create sample size estimates to facilitate the selection of target contests.
  - (2) Counties are not required to upload a CVR export multiple times during the same election to the RLA tool unless requested to do so by the Department to facilitate an updated sample size estimate.

- (e) Sample size estimates. Upon completion of tabulation on election night, counties are required to export an initial CVR export from their voting system and hash and upload the export and hash value to the RLA tool. Counties are not required to upload a ballot manifest to the RLA tool for the purposes of creating sample size estimates.
  - (1) The Department of State will use the election night CVRs to create sample size estimates to facilitate the selection of target contests.
  - (2) Counties are not required to upload a CVR export multiple times during the same election to the RLA tool unless requested to do so by the Department to facilitate an updated sample size estimate.
- (f) Ballot manifest. The county must maintain an accurate ballot manifest in a form approved by the Secretary of State and independent of the voting system.

The ballot manifest must uniquely identify for each tabulated ballot the scanner on which the ballot is scanned, the ballot batch of which the ballot is a part, the number of ballot cards in the batch, and the storage container in which the ballot batch is stored after tabulation. The county must secure and maintain in sealed ballot containers all tabulated ballots in the batches and order they are scanned. The county must maintain and document uninterrupted chain-of-custody for each ballot storage container.

- (g) RLA tabulation. On the tenth day after election day, the county must finish tabulating all in-person and accepted mail ballots cast by voters registered in the county. The county may but is not required to include in the RLA tabulation any provisional ballots and property owner ballots that have been verified and accepted on or before the ninth day after election day. Immediately after completing the RLA tabulation, and to the extent permitted by its voting system, the county must also generate and preserve:
  - (1) A summary results report, showing overvotes, undervotes, blank-voted contests, and valid write-in votes;

- (2) A results file export suitable for uploading to the Secretary of State's election night reporting system; and
  - (3) A CVR export.
- (h) CVR export verification. Counties conducting a comparison audit must verify that:
- (1) The number of individual CVRs in its CVR export equals the aggregate number of ballot cards reflected in the county's ballot manifest as of the tenth day after election day; and
  - (2) The vote totals for all choices in all ballot contests in the CVR export equals the vote totals in the summary results report for the RLA tabulation.
  - (3) After verifying the accuracy of the CVR export, the county must apply a hash value to the CVR export file using the hash value utility provided by the Secretary of State.
- (i) Comparison audit uploads. No later than 2:00 p.m. MT on the tenth day after election day, each county conducting a comparison audit must upload:
- (1) Its verified and hashed ballot manifest, and the ballot manifest's hash value, to the Secretary of State's office;
  - (2) Its verified and hashed CVR export, and the CVR export's hash value, to the Secretary of State's office; and
  - (3) Its RLA tabulation results export to the Secretary of State's election night reporting system.
- (j) Ballot polling audit uploads. No later than 2:00 p.m. MT on the tenth day after election day, each county conducting a ballot polling audit must submit or upload:
- (1) Its verified and hashed ballot manifest, and the ballot manifest's hash value, by email to the Secretary of State's office;
  - (2) Its cumulative tabulation report, by email to the Secretary of State's office; and

- (3) Its RLA tabulation results export to the Secretary of State's election night reporting system.
- (k) Random seed. The Secretary of State will convene a public meeting on the thirteenth day after election day to establish a random seed for use with the Secretary of State's RLA tool's pseudo-random number generator based on Philip Stark's online tool, *Pseudo-Random Number Generator using SHA-256*. This material is incorporated by reference in the Election Rules and does not include later amendments or editions. The following material incorporated by reference is posted on the Secretary of State website and available for review by the public during regular business hours at the Colorado Secretary of State's office: *Pseudo-Random Number Generator using SHA-256* available at <https://www.sos.state.co.us/pubs/elections/VotingSystems/riskAuditResources.html>. The Secretary of State will give public notice of the meeting at least seven calendar days in advance. The seed is a number consisting of at least 20 digits, and each digit will be selected in order by sequential rolls of a 10-sided die. The Secretary of State will randomly select members of the public who attend the meeting to take turns rolling the die, and designate one or more staff members to take turns rolling the die in the event that no members of the public attend the meeting. The Secretary of State will publish the seed on the Audit Center immediately after it is established.
- (l) Selection of target contests. No later than 5:00 p.m. MT on the Friday after election day, the Secretary of State will select the target contests. In a general or coordinated election, the Secretary of State will select at least one statewide contest, and for each county at least one other contest. The Secretary of State will select other ballot contests for audit if in any particular election there is no statewide contest. In a primary election, the Secretary of State will select at least one contest of each major political party in each county. The Secretary of State will publish a complete list of all target contests on the Audit Center. The Secretary of State will consider at least the following factors in selecting the target contests:
  - (1) The closeness of the reported tabulation outcome of the contests;

- (2) The geographical scope of the contests;
  - (3) The number of ballots counted in the contests;
  - (4) Any cause for concern regarding the accuracy of the reported tabulation outcome of the contests;
  - (5) Any benefits that may result from auditing certain contests;
  - (6) The ability of the county clerks to complete the audit before the canvass deadline; and
  - (7) Any recommendations provided by county clerks or the public regarding which contest should be targeted.
- (m) Number of ballot cards to audit. The Secretary of State will determine the number of ballot cards to audit to satisfy the risk limit for the target contests based on the ballot manifests submitted by the counties. The number of ballot cards to audit will be determined according to the formulas and protocols published by Mark Lindeman and Philip B. Stark in *A Gentle Introduction to Risk-limiting Audits*, as applied in Philip Stark's *Tools for Comparison Risk-Limiting Election Audits*, and *Tools for Ballot-Polling Risk-Limiting Election Audits*. The publications cited in this Rule are incorporated by reference in the election rules and do not include later amendments or editions of the incorporated material. The following materials incorporated by reference are posted on the Secretary of State website and available for review by the public during regular business hours at the Colorado Secretary of State's office:
- (1) Mark Lindeman and Philip B. Stark, *A Gentle Introduction to Risk-limiting Audits*, IEEE Security and Privacy, Special Issue on Electronic Voting, (Mar. 16, 2012), at <https://www.sos.state.co.us/pubs/elections/VotingSystems/riskAuditResources.html>.
  - (2) Philip B. Stark, *Tools for Comparison Risk-Limiting Election Audits*, (Feb. 26, 2017), at <https://www.sos.state.co.us/pubs/elections/VotingSystems/riskAuditResources.html>.

- (3) Philip B. Stark, *Tools for Ballot-Polling Risk-Limiting Election Audits*, (Feb. 16, 2017), at <https://www.sos.state.co.us/pubs/elections/VotingSystems/riskAuditResources.html>.
- (n) Random selection of ballot cards for audit. The Secretary of State will randomly select the individual ballot cards to audit. The Secretary of State will use a pseudo-random number generator with the seed established under subsection (h) of this Rule to identify individual ballot cards as reflected in the county ballot manifests. The Secretary of State will notify each county of, and publish on the Audit Center, the randomly selected ballot cards that each county must audit no later than 11:59 p.m. MT on the thirteenth day after election day.

### 25.2.3 Conducting the audit

- (a) At least two members of different parties of the audit board must locate and retrieve, or observe the location and retrieval by county election staff, of the randomly selected ballot card from the appropriate storage container. The audit board must verify that the seals on the appropriate storage containers are those recorded on the applicable chain-of-custody logs.
  - (1) In counties conducting comparison audits, the audit board must examine each randomly selected ballot card and report the voter markings or choices in all contests using the RLA Tool or other means specified by the Secretary of State. The audit board may refer to the digital image of the audited ballot card captured by the voting system in order to confirm it retrieved the correct ballot card randomly selected for audit. If the scanned ballot card was duplicated prior to tabulation, the audit board must retrieve, compare, and report the markings on the original ballot card rather than on the duplicated ballot card. The audit board must complete its reports of all ballot cards randomly selected for audit no later than 5:00 p.m. MT one business day before the canvass deadline.
  - (2) In counties conducting ballot polling audits, the audit board must examine and report the voter markings or choices in only the target contest on each randomly selected ballot card

in a form approved by the Secretary of State. The audit board may refer to the digital image of the audited ballot card captured by the voting system in order to confirm it retrieved the correct ballot card. If a randomly selected ballot card was duplicated prior to tabulation, the audit board must retrieve, compare, and report the voter markings in the target contest from the original ballot card rather than the duplicated ballot card. The audit board must complete its reports of all ballot cards randomly selected for audit no later than 5:00 p.m. MT one business day before the canvass deadline.

- (b) The audit board must interpret voter markings on ballot cards selected for audit in accordance with the Secretary of State's Voter Intent Guide. If the audit board members cannot unanimously agree on the voter's intent, they must indicate that in the appropriate contest in the RLA tool's audit board user interface, or the ballot polling audit form approved by the Secretary of State.
- (c) To the extent applicable, the Secretary of State will compare the audit board's reports of the audited ballot cards to the corresponding CVRs and post the results of the comparison on the Audit Center. The RLA will continue until the risk limit for the target contests is met or until a full hand count results. If the county audit reports reflect that the risk limit has not been satisfied in a target contest, the Secretary of State will randomly select additional ballots for audit.
- (d) The audit board must sign, date, and submit to the Secretary of State a report of the results of the risk-limiting audit on the approved form no later than 5:00 p.m. MT on the business day before the canvass deadline. The report must include any discrepancies found and the corresponding ballot images.
- (e) The Secretary of State will review the audit board's report and may direct the county clerk to conduct additional audit rounds, a random audit, a full hand count, or other action. The Secretary of State may instruct the county to delay canvass until it completes any additional audit or other action.

25.2.4 No later than the third business day following the expiration of the deadline to request a recount under section 1-10.5-106(2), C.R.S. or the completion of any recount, whichever is later, a county that conducted a

comparison audit must review its CVR file and redact voter choices corresponding to any ballot card susceptible to being personally identified with an individual voter, as required by section 24-72-205.5(4)(b)(iii), C.R.S.

25.2.5 If a county clerk fails to follow the procedures for a risk limiting audit as outlined in this Rule, the Secretary of State will direct the county clerk on the steps to take to complete a post-election audit. In addition, no later than 90 days before the next election, the county clerk must submit a written RLA remediation plan outlining the procedures the county will follow to ensure compliance with this Rule.

25.2.6 The Secretary of State may, by order, alter any of the requirements outlined in Rule 25.2.

25.3 Removal and replacement of audit board members. The county clerk may remove for cause any member who fails or refuses to perform any of the functions he or she is charged with under these Rules. If the county clerk removes an audit board member for cause, he or she must notify the Secretary of State and consult with the county chairperson of the removed member's political party to appoint a replacement.