

Comments on Working Draft of Proposed Election Rules of 5/15/2017

Mark Lindeman and risk-limiting audit advocates, 5/22/2017

We appreciate all the effort that has gone into preparing this working draft, and the opportunity to comment upon it at an early stage. We have learned much through our discussions with state and local election professionals over the past few months, and we look forward to learning even more as Colorado moves toward finalizing this path-breaking set of rules and implementing risk-limiting audits of vote tabulations in the November election. Many people will be looking to Colorado to set an example for how statewide RLAs should be implemented – and this early start will help to assure ultimate success.

Given the short time frame for reviewing the document, and differences of opinion and emphasis among us, we have chosen to focus this response on relatively few points of particular importance.

For the most part we have keyed our comments to specific pages and lines of the draft. However, one concern goes beyond a particular clause or paragraph: the role of the secretary of state's office in coordinating audits. As you know, a single "round" of auditing may not suffice to satisfy the RLA requirements. The draft reflects this understanding especially at P 6, L 29-34 (new rule 10.4), which prevents counties from canvassing or certifying their results without the secretary of state's approval and authorizes the secretary to extend the canvassing deadline; and at P 16, L 18-21 (25.2.3 (G)), which makes clear that the RLA will continue until the risk limit is met (or a full hand count is conducted). Nonetheless, several of us are concerned that the draft seems to describe a passive role for the secretary's office. In particular, if the initial round of auditing continues until the end of the day before the canvass deadline, delays seem far more likely than if the initial round can be completed earlier. (Or it may be possible for the secretary's office to expand a statewide audit even before all counties have completed the initial round, thus permitting others to complete their work sooner.) It may be that such issues are better handled outside of rule, but it seems wise at least to authorize the secretary to set intermediate deadlines and reporting requirements (e.g., at least daily updates) for audit results.

Major comments (somewhat in order of importance)

P 15, L 11-13, 15, & 17; 36-44: "ballot batches" in ballot polling audits. We cannot overemphasize: ballot polling audits poll *ballots*. It is possible to do a "batch polling audit," but it is wildly, egregiously inefficient: in many cases, one can expect to hand-count as many (or almost as many) full batches as the number of ballots one would inspect in a proper ballot polling audit – that is, perhaps hundreds or thousands of times as many ballots as a ballot polling RLA would require. Also, software designed to support ballot polling audits would not work with batch polling.

An alternative reading of the proposal is that the ballots in each audited batch would be treated as if they constituted a random sample of ballots. However, this is not a valid ballot polling procedure, would not satisfy any known definition of RLAs, and would violate state law. One or two batches of ballots, no matter how colloquially random they seem, cannot be construed as

representative of entire counties – and indeed, it is unlikely that they would be. It would be catastrophic to set the precedent of treating batches of ballots as if they consisted of randomly sampled ballots.

Suggestion: remove references to ballot batches and distinction between comparison and ballot polling audits: “Random selection of ballots for audit. The Secretary of State will randomly select the individual ballots to audit, using a pseudo-random number generator with the seed established under subsection (b) of this rule to identify individual ballots as reflected in the county ballot manifests.” Also remove “or ballot batches” from the last sentence. At (d) (lines 36-44), similarly remove all references to batches; e.g., “each ballot contained in the randomly selected ballot batches” could become “each ballot in the randomly selected sample.” Audit interpretations of ballots in comparison and ballot polling audits can and should be recorded in the same way.

P 12, L 11-14: definition of risk-limiting audit. The draft definition does not make clear that RLAs as defined here only check vote tabulation. The criterion “if the reported outcome of an audited contest is incorrect” has no specific meaning (unless one applies the statutory definition of “incorrect outcome,” but it is far preferable for the rule to stand on its own). Also, the draft refers to “Rule 25.3” when it appears to intend 25.2.

Suggestion: “Risk-limiting audit” or “RLA” means a post-election audit of votes on paper ballots and/or VVPAT records, conducted in accordance with section 1-7-515, C.R.S., and Rule 25.2, that 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 outcome.

P 12, L 30-31: timing of random seed. Because the random seed determines what ballots are audited, it must be selected after ballot manifests and CVRs are committed. Selecting the seed before election day – or even between election day and publication – creates the possibility of subverting the audit through advance knowledge of what ballots will be audited.

Suggestion: change “No more than 30 days before election day...” to “After all CVRs and ballot manifests have been finalized and committed as specified in subsections (h) and (i) of this rule...” (Given this change of schedule, it may be preferable to reorder the subsections.)

Selecting the contests to be audited (related points), P 13: L 22-32

L 22-24: scope of audited contests. Although we understand that the secretary’s office plans to revisit the rule before 2018, most of us would recommend at least requiring all federal contests (or, more ambitiously, statewide, federal, and state legislative) to be selected for RLA.

Whether or not that is done, we recommend at least opening space for what we have called opportunistic auditing of contests for which there is no required risk limit, but which appear on ballots that are part of the audit sample. Our past recommendations for

audit boards to interpret and report all votes cast on ballots in the audit sample¹ have not been adopted. A less ambitious alternative would be for the secretary of state to retain the authority to designate contests to be opportunistically audited. This is a practical means to expand the scope and value of the audit with relatively little increase in workload.

Suggestion: consider designating categories of contests to be automatically selected for RLA; add language to the effect that the secretary of state may designate additional contests for which audit boards shall interpret and report votes if those contests appear on ballots in the audit sample. (Audit boards could also be given this authority.)

L 30: diluted margin criterion. The definition of diluted margin here is incorrect. The technical definition is subtle, depending upon implementation details – and the secretary can consider the closeness of a contest without defining this term in rule.

Suggestion: at line 30, replace “The diluted margin of the contests” with “The closeness of the contests, prioritizing the closest contests. Delete the definition of “diluted margin” on p. 11, lines 23-30.

Also, consider adding criteria such as “The geographical scope of the contests” (which may increase or decrease the priority of a contest) and “Cause for concern about tabulation accuracy.”

L 31-32: ability-to-complete criterion. The ability of county clerks to timely complete an audit is a legitimate concern, but we resist enshrining it in rule. If a close contest requires a painstaking audit, it would be far better to provide additional time for the audit under the new rule 10.4 than to invoke this rule. (If a contest is disproportionately difficult to audit – for instance, because it appears on a small fraction of ballots that cannot easily be located among the rest – other criteria could accommodate such a case.)

Suggestion: at lines 31-32, remove the “ability of county clerks to complete...” criterion (2).

P 15, L 26-29: conduct of comparison audits. This language should be rewritten to clarify that the audit board should interpret the voter markings on paper ballots “blind,” without referring to the corresponding CVRs. Only after the human audit interpretations have been recorded should these be compared to the voting system interpretations.

Suggestion: replace the language in the first s. with language to the effect that the audit board should retrieve each randomly selected ballot, record its interpretation of the voter markings on each paper ballot, and subsequently compare that interpretation to the voting system’s interpretation.

¹ We have further suggested that these contests be subject to an auxiliary risk limit, so that if one or two contests required very extensive auditing, audit boards would not be required to interpret votes in all the other contests indefinitely.

P 13, L 33-35: provisional and property owner ballots. The draft rule permits provisional and property owner ballots to be tabulated at some unspecified time after E+9, but is silent as to whether and how these ballots are subject to audit or otherwise considered. A risk-limiting audit *cannot* simply ignore these ballots, since they affect the contest margins. It should be feasible to use worst-case assumptions about how these ballots could affect the margins, or simply to hand-count them as part of the audit. (But there were many such ballots, a more complicated sampling method might be preferable.) Moreover, if some ballots are to be counted after the RLA tabulation, it may be appropriate to withhold some additional ballots to be counted at the same time, in order to protect vote secrecy.

Suggestion: add language to, at a minimum, ensure that any ballots that are not counted and reported as part of the RLA tabulation uploads are incorporated in the audit either through hand counts or by making worst-case assumptions about the votes thereupon (for instance, that all were cast for the putative runner-up in a vote-for-one contest).

Other comments

P 9, L 16-17: audit requirement for broken seals. It isn't clear whether the "full (all races) post-election audit on the device" means a full hand count of all votes counted thereupon, or something else. (Also, we recommend using "contests" consistently.)

Suggestion: change that phrase to "post-election audit comprising a hand count of all votes, in all contests, counted on the device."

P 11, L 17 and 20: definition of "ballot polling audit" and "comparison audit." The draft rule presently is internally consistent in using these terms to apply only to risk-limiting audits. However, these audit methods can be used in non-risk-limiting audits as well, and indeed it might be desirable to do so in cases where the secretary grants a waiver.

Suggestion: remove "risk-limiting" from these definitions. (RLAs, by definition, impose risk limits, so adding "risk-limiting" is redundant at best.)

P 12, L 15-16: RLA tool. This tool should not be limited to comparison audits. Suggestion: "to help counties conduct audits and report results."

P 12, L 20-23: comparison/ballot polling audit requirement. Although it generally makes sense for "CVR counties" to conduct comparison audits, and "non-CVR counties" to conduct ballot polling audits, we can imagine scenarios in which other methods may be preferable. It is safer at least to allow the secretary to approve alternative methods – provided, of course, that these satisfy the requirements of RLAs.

Suggestion: add language to the effect of "unless the secretary of state approves an alternative method."

P 12, L 25-29: setting risk limits. Most of us would permit varying risk limits per contest, not just per sampling method. Also, there are varying degrees of concern that a stringent maximum risk limit may have undesired consequences in some cases.

Suggestion: “The secretary of state may establish different risk limits for different types of contests and audits, but in no event will the risk limit exceed five percent. In exceptional cases, the secretary of state may grant waivers from these requirements.” (This may not be a consensus recommendation.)

P 12, L 32 and P 15, L 13: pseudo-random number generator. It is correct to refer to this as a pseudo-random number generator (PRNG) throughout. It may sound scary to use a “pseudo-random” mechanism for random selection, but the output of the generator is random in that it cannot be predicted until the random seed is provided – yet it is completely predictable once the seed is known.

Suggestion: change “random” to “pseudo-random” in both places. It may be desirable to add the acronym PRNG, just to emphasize that this odd phrase is a term of art.

P 13, L 13: ballot manifest format. Because ballot manifests are used to identify the random samples, the secretary’s office should consider specifying a format (perhaps somewhat customizable), not simply approving formats.

P 13, L 37: summary results report. The results report should include undervotes, overvotes, and blanks.

P 14, L 16-28: upload requirements. The secretary of state’s office will need to use the ballot manifests to designate the audit sample. Given that “batch polling” is unrealistic, all ballot manifests should be uploaded in the same way. Therefore, these sections can be combined.

Suggestion: combine or refactor (h) and (i) to reflect that all counties upload their ballot manifests using the RLA tool and their tabulation results to the ENR system -- and that comparison audit counties additionally upload their CVR export.

P 15, L 17-18: publishing ballots to audit. [After deleting references to ballot batches....] The secretary can specify a minimum sample size (presumably expected to attain applicable risk limits), but can’t know in advance whether additional auditing will be required. It probably makes sense to provide longer lists at the outset.

Suggestion: For instance, insert after “must audit”: “, and additional lists of ballots each county might need to or choose to audit,” Also, on P 16, L 21, replace “will randomly select additional ballots for audit” with “will designate additional ballots for audit from the published list” (or words to that effect).

P 15, L 20-21: audit deadline. Consider making explicit that the secretary can modify this deadline per [the new] rule 10.4 (P 6, L 29-34).

P 15, L 31-35; P 16, L 9-11 (and P 16, L 9-11): reporting of audit interpretations. Both comparison audits and ballot polling audits require the audit board to record its interpretations of vote markings, which can be done with the RLA tool – but this language on page 15 requires the audit board to provide a separate report on comparisons. Page 16 then requires that the audit board determine and report, inter alia, whether each discrepancy resulted in a one- or two-vote margin overstatement or understatement. The stated definitions of those terms in the draft rule

are incorrect (in brief, all discrepancies matter), and it is unnecessary to task county audit boards with applying the correct definitions. We believe that audit boards should be required to record their vote interpretations and any additional steps using the RLA tool, and then the secretary assisted by software should handle the determinations and comprehensive reporting of results.

Suggestion: on p. 15, combine (c) on comparison audits and (d) on ballot-polling audits to emphasize the close similarities between the processes: audit boards retrieve individual ballots and record their human interpretations; if a ballot was duplicated, they take an additional step; in a comparison audit, if a discrepancy is found, an additional step of accounting for the discrepancy may be required. Revise the reporting requirements to clarify that audit boards are responsible for reporting the results of these specific steps, and the secretary is ultimately responsible for the detailed reporting. Remove the definitions of margin overstatements and understatements.

P 17 L 19-25: waiver procedure for auditing ballots on scanners. A prudent additional step under (2) is to rescan the remaining ballots originally tabulated on the selected scanner, and verify that the two rescan totals sum to the original scanner totals. (This approach counters a hypothetical attack in which a scanner is maliciously programmed to count up to some number of ballots correctly, and count any additional ballots incorrectly.)

P 18 L 1, 2, 4: audit report requirement under waiver. In 1, change “or” to “and”; in 2 and 4, for consistency, refer to “contests” instead of “races.”