

## Comments on Preliminary Draft of Proposed Rules

### Office of the Colorado Secretary of State Election Rules, 8 CCR 1505-1

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I am writing to draw attention to the severe shortcomings of the proposed amendments to Rules 10.9.2, 10.12 and 10.13.3, whose purpose is to allow recounts based off ballot images, test recount equipment and review ballots for voter intent respectively.

Ballot images produced by voting system scanners have many limitations when treated as representations of voted paper ballots. While the images do originate through a physical process, and may be visually presented as images on a computer screen, they are not like photographs taken on film. They are computer data, stored as ones and zeroes and handled by computer software. As a general principle, though the specifics may vary with the specific system, they can be deleted, replaced or tampered with like any other computer data. Additionally, the recording and interpretation process can also be erroneous or insufficient.

Logic and Accuracy testing (L&A testing), such as proposed by Colorado for use prior to conventional machine recounts (amended Rule 10.12), is intended to test for some of the problems with the use of scanners and software, but there is no guarantee that the equipment will behave, on the far larger number of votes being recounted, as it does on the smaller number of votes it is tested on. Further, a competent attacker would have the system behave as expected when tested, and maliciously during the election and recount<sup>1</sup>. Finally, L&A testing cannot detect problems that might arise from marks actually produced by voters in the election, or some batches of ballots not being scanned and followed by some of equal size being scanned twice. There are no tests that can replace the manual examination of a sufficient number of paper ballots, such as is performed in a Risk-Limiting Audit of the same contest.

While amendments to Rule 10.13.3 require the adjudication of votes that are ambiguous, write-ins, overvotes or undervotes, the process relies on the scanner determining them as such and that depends on the images properly representing the paper. That is, if the scanner erroneously, or because of malicious software, treats a mark as a clear, valid vote it will not be examined by a human—even though such examination might have revealed it to be a vote intended for another candidate, a struck-out unintended vote. Only examination of paper ensures that all the voter marks including those in readable text are considered by human adjudicators to resolve uncertainty. Errors in ballot programming instructions regarding the

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<sup>1</sup> Volkswagen's 2L Diesel cars were found to use more emission controls when they were being tested than during normal use. On examination, it was found that their software was written to detect when a test was underway. See [https://en.wikipedia.org/wiki/Volkswagen\\_emissions\\_scandal](https://en.wikipedia.org/wiki/Volkswagen_emissions_scandal). In our case, software manipulated without vendor knowledge could also provide testers with the results they expected to see. Then the software could perform differently when used in the recount.

order and position of the various contests and options can lead to unintended votes and swapping of votes among candidates, as can intentional hacking, neither of which will lead to the types of votes that will be adjudicated under this rule. Thus, this rule does not adequately allow for the correction of votes recorded contrary to instructions (whether through defective ballot images or incorrect interpretation of a correct ballot image).

The paper ballots themselves—and not the corresponding electronic ballot images—provide the only reliable independent evidence about voter intent. **Every issue and contested race—and at a minimum for 2018, all statewide contests —should be followed by a public risk-limiting audit or a public recount that manually examines the paper ballots.**

I recommend that the amendment to 10.9.2 be as follows:

10.9.2 ~~A COUNTY THAT HAS SUCCESSFULLY COMPLETED A COMPARISON AUDIT UNDER RULE 25.2, NEED NOT RE-SCAN BALLOTS DURING A RECOUNT BUT MUST RE-ADJUDICATE BALLOT IMAGES FOR VOTER INTENT IN ACCORDANCE WITH RULE 10.13.3~~ ALL RECOUNTS MUST BE PUBLIC MANUAL RECOUNTS OF PAPER BALLOTS, EXCEPT FOR CONTESTS THAT WERE SUBJECT TO A RISK-LIMITING AUDIT AND WERE ALREADY HAND-COUNTED IN PUBLIC. THE PUBLICLY HAND-COUNTED OUTCOME HOLDS.

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