

## Appendices

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## Appendix 1

### **Background on the Cuyahoga Collaborative Public Audit:**

#### **Creation, Purposes, Authority, and Participants in the Collaborative Public Audit**

### **I. The Need to Achieve Independent Verification of Election Results**

Achieving accuracy in reported election results is the primary objective for any quality election administration. Given the range of recent information reported nationally about possible problems with e-voting technologies, and also some of the problems the Cuyahoga County Board of Election (BOE) experienced in prior elections, election reform organizations and the major political parties sought to have the local election results independently verified as accurate reflections of the ballots cast in the November 2006 election. In early fall, the chief initial public concerns focused on the DRE touchscreen voting devices which were to be used at polling places on election day.

After discussions with election reform organizations about their concerns, the Public Monitor of Cuyahoga Election Reform<sup>1</sup> introduced at a public Board meeting a proposal for a Collaborative Public Audit. The proposal pledged that the Monitor would seek the cooperative involvement of the local Democratic and Republican Parties, plus several election reform organizations to conduct the independent audit. The audit, per the reform organizations' requests, was to focus on the Diebold DRE touchscreen voting machines. The DRE units are the primary technology used in Cuyahoga County for Election Day voting at the polling locations. The DRE units are also used in "walk-in" absentee voting.<sup>2</sup>

The BOE Board Members unanimously approved the DRE audit proposal (and one other presented in the same verification proposal) on October 2, 2006, noting that some flexibility might be needed and that the Board's attorney needed to approve its legality. Thereafter, the county political parties' chairmen (Republican and Democratic) requested that the audit be extended to include optically scanned absentee ballots. The Audit Committee, which had been formed and begun working, agreed to this extension. The CCBOE Board Members unanimously approved the extension as well.

The Collaborative Audit participants believe the public wants independent verification that the election results that the e-voting technology has generated are accurate. Additionally, they believe both the election administrative staff and the public at large need to know whether the voting machines' programming maintained its integrity after the machines passed the pre-election testing and were deployed to the polling locations for Election Day. Reliable information on these and other questions are crucial so that sound decisions can be

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<sup>1</sup> The Center for Election Integrity of Cleveland State University per a proposal and testimony prepared by its Director, Candice Hoke.

<sup>2</sup> Functionally, "walk-in" absentee voting is a form of early voting.

made as to the voting and database technologies we used and so that any corrections in administrative or other systems that are needed can be identified. While the audits that were conducted are limited rather than comprehensive and conclusive on these points, the information acquired is useful on these and other issues.

A national Election Audit Workgroup teaming the Brennan Center with with the Samuelson Law, Technology & Public Policy Clinic at Boalt Hall School of Law (UC Berkeley), as well as several election officials and leading academics as been working to evaluate current audit laws and procedures and provide critical analysis to public officials as they begin to adopt audit schemes and procedures. The workgroup has thus far identified five core goals that should motivate the design of election auditing: increasing public confidence in the results of an election; deterring fraud against the voting system; detecting large-scale systemic errors; providing feedback that will allow jurisdictions to improve elections and machinery in future years, and confirming to a high level of confidence that a 100% manual recount would not change the outcome of the race.

We agree strongly with this statement of election auditing design goals but would add a sixth: providing additional incentives for the staff to reach higher standards of accuracy. In order to achieve these six and other auditing goals, we have concluded, as has the Election Audit Workgroup, that the independence of the auditing entity is essential.<sup>3</sup>

The Collaborative Audit Committee commends the Cuyahoga Board of Election for taking this Ohio leadership role in initiating election auditing and thus creating an independent mechanism for verifying the announced election results. We would also like to thank the over forty volunteers that gave their time over numerous days to help conduct this audit. Without this huge volunteer effort, this audit would not have been possible.

### **Policy Formation, Structure, and Participating Entities**

The participating organizations that exercised policymaking powers over the audit and solicited volunteers were:

- Democratic Party of Cuyahoga County
- Republican Party of Cuyahoga County
- League of Women Voters
- CASE-Ohio (Citizens' Alliance for Secure Elections)
- Greater Cleveland Voter Coalition

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<sup>3</sup> Lawrence D. Norden, Statement to the U.S. House of Representatives, Committee on House Administration, Subcommittee on Elections, March 20, 2007 at 2; Candice Hoke, Statement to the U.S. House of Representatives, Committee on House Administration, Subcommittee on Elections, March 20, 2007 at 2 (this testimony to the Subcommittee on Elections that held hearings on Federal Election Auditing can be found at <http://www.verifiedvotingfoundation.org/article.php?id=6445>).

The Center for Election Integrity at CSU, in its role as Public Monitor for Cuyahoga County Board of Elections, served as the coordinator of the audit process. Center staff undertook a great deal of auditing duties but proposed the audit structure so that it acted as a neutral facilitator rather than a policymaker with a vote in Collaborative Audit group decisions. The Center for Election Integrity supplied professional staff services. Assistant Director Abigail Horn led the Center's audit work.

The policy decisions governing the audit, including which races to audit, were made by the representatives of the participating policymaking organizations. Each participating organization was limited to a maximum of two representatives on the planning and policymaking Audit Committee. The political parties sent experienced professional auditors and lawyers. The election reform organizations supplied individuals with a wide range of election expertise, including software engineers with technical voting technology expertise and poll workers or election observers. Virtually all decisions were made by consensus.

CSU's Northern Ohio Data Information Service (NODIS)<sup>4</sup> directed by Dr. Mark Salling designed the sample and audit methodology and provided analysis of the results.

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<sup>4</sup> <http://nodisnet1.csuohio.edu/nodis/index.shtml>

## Appendix 2

### **Methodology and Procedures to Select Sample for Cuyahoga County Election Audit of DRE Long Reports versus GEMS Tabulations**

Prepared by  
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Cleveland State University

December 28, 2006

This report describes the methodology used to select the sample of precincts used in the audit of the printed long reports produced from the electronic voting machines (DRE) immediately after the polls close on Election Day.<sup>5</sup> This audit is to verify the accuracy of the long reports against the published output of GEMS tabulation system that is produced after loading data from each of the memory cards used by the DREs.<sup>6</sup>

To insure that any discrepancy found is unlikely to affect the outcome of an election, the sample size is based on the closest race among those selected for inclusion by the collaborative audit group. The audit group selected county or statewide races with each political party selecting a race and civic groups selecting the third race. The unofficial election results, which included electronic voting machines (DRE) at the polling locations and early absentee optical scanned ballots, were used to determine the closest race. If the race was a statewide race, then the margin between the candidates at the state level was used in addition to the county level to determine the closeness of the race.

The steps involved in determining the sample size are as follows.

1. Calculate the percentage vote margin between the top two candidates of the closest race. In this case, the three selected races had only two candidates each.
2. Since the closest race was a statewide race and the statewide percent winning margin was less than the county-wide margin, the statewide margin percentage was used. The resulting margin was 2.1 percent of the votes cast for that race (state auditor).
3. Apply the state percentage vote margin (2.1%) to the votes in the county for the selected race, divide by two, and add one to obtain the votes needed to change the winner of the race. This provides the number of votes in the county that need to be switched in order to change the outcome of the race, assuming that the percentage margin is applied uniformly statewide.
4. Assume a maximum vote shift of 15 percent between the leading candidate and all other candidates in any precinct. (The Brennan Center recommends 7.5 percent for polling

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<sup>5</sup> Multiple DREs may be (are often) used at each polling place to collect votes on one or more precincts.

<sup>6</sup> This audit is performed since the long reports are available for audit soon after the election. The voter-verified paper audit trail (VVPAT) is not available for the audit because Ohio state law bars access to it.

location sampling and 15 percent for voting unit sampling.<sup>7</sup> This value represents the estimated maximum proportion of votes per polling location, precinct, or voting machine that needs to be switched for a candidate in order to change the outcome of the race.)

5. Sort precincts by descending order of votes cast in the closest race using the unofficial results reported from the Cuyahoga County Board of Elections tabulation server (based on voting from the DREs at the polls and the early absentee results).
6. Calculate the vote shift per precinct:
  - a. Sort the precincts in descending order by votes cast in the closest race.
  - b. Apply the 15 percent vote shift rate to each precinct, rounding up to the nearest vote. The 15 percent vote shift rate is from one candidate to another or 30 percent vote shift margin.
  - c. If the winning candidate did not receive 15 percent of the votes in any given precinct, then assign a zero vote shift for the precinct.

This would total to the necessary votes to change the election result (if applied uniformly across the state).

7. Sum the vote shift amount among the precincts until reaching (or just exceeding) the number calculated in step three; i.e., the number of votes necessary to change the outcome. The count is the minimum number of corrupt votes to alter the election with a 2.1 percent margin difference. The number of precincts, which were required to obtain the minimum number of corrupt votes, is the minimum number of corrupt precincts required to alter the election.
8. Use a hypergeometric distribution to determine the probability  $P$  of selecting at least one corrupt precinct in a sample of  $s$  precincts selected from a population of  $N$  precincts containing  $b$  corrupt precincts. The formula is:

$$P = 1 - \frac{\binom{N-b}{s}}{\binom{N}{s}}$$

This formula must be solved for  $s$  with a computer program<sup>8</sup> or by estimation. A computer program was used since it gives the most accurate result. The formula was solved to determine the number of precincts that must be audited to insure 95 percent and 99 percent confidence interval levels.

- a. The 99 percent confidence intervals requires 110 precincts
  - b. The 95 percent confidence intervals requires 72 precincts;
9. Add 20 percent to the sample size to account for “long reports” that may not be available or useable. Since the 99 percent confidence level was preferred, 22 secondary or “back-up” precincts were added to the primary 110 precincts to be drawn in the sample. Thus,

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<sup>7</sup> The Brennan Center Task Force on Voting System Security, Lawrence Norden, Chair, *The Machinery of Democracy: Protecting Elections in an Electronic World*, pg 22, [http://www.Brennancenter.org/dynamic/subpages/download\\_file\\_39288.pdf](http://www.Brennancenter.org/dynamic/subpages/download_file_39288.pdf).

<sup>8</sup> A Matlab program was converted to SAS to calculate the sample size, based on the minimum corrupt votes and the number of corrupt precincts from step 7. The Matlab program is available from Dopp, Kathy and Stenger, Frank: “The Election Integrity Audit,” National Election Data Archive Project, September 25, 2006, <http://electionarchive.org/ucvAnalysis/US/paper-audits/ElectionIntegrityAudit.pdf>.

110 precincts are needed to achieve the objectives, though a total of 132 precincts are to be drawn.

The following steps were then used to select the sample precincts.

10. Select a sampling seed. Single-digit numbers submitted by each member of the audit collaborative were used to construct the seed.
11. Obtain the overall sample ( $S_{\text{overall}}=132$ ) with 'proc surveystest' in SAS®<sup>9</sup> from the population of  $N = 1,434$  precincts.
12. Using the same seed as was used in the overall sample selection, obtain the primary sample ( $S_{\text{primary}} = 110$ ) with 'proc surveystest' in SAS® from the overall sample of useable forms ( $S_{\text{useable}}$ ), where  $S_{\text{useable}}$  is expected to be between 110 and 132.
13. Sort the 110 primary sample precincts and the 22 secondary sample precincts separately in descending order by votes cast in the largest precinct and polling location. This kept selected precincts at the same polling place together in the listing to facilitate data collection from the long reports. It also insured that the largest precincts were examined first and included in the sample in the event that a complete sample could not be implemented.

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<sup>9</sup> SAS®, <http://www.sas.com>.

### Appendix 3 Example of the Form for Recording DRE “Long Report” Data

| Recorder: _____    |                           | Reviewer: _____        |   | Start Date: _____                      |                         | Time: _____      |           | End Time: _____ |               |           |         |
|--------------------|---------------------------|------------------------|---|--|-------------------------|------------------|-----------|-----------------|---------------|-----------|---------|
| Polling Place Name | Precinct Name             | DRE Serial Number      | Report OK - not torn, missing, incomplete (Yes, No) | Precinct Name matches Report (Yes, No) | Report signed (Yes, No) | Total Votes Cast | Judicial  | Auditor         | Supreme Court | Reviewed? | Comment |
| 1                  | 1410-ST. SAVA CHURCH HALL | BROADVIEW HEIGHTS-03-B |   |  |                         |                  | Gallagher | Sykes           | O'Neill       |           |         |
| 2                  | 1410-ST. SAVA CHURCH HALL | BROADVIEW HEIGHTS-03-B |   |  |                         |                  | Hastings  | Taylor          | O'Donnell     |           |         |
| 3                  | 1410-ST. SAVA CHURCH HALL | BROADVIEW HEIGHTS-03-B |   |  |                         |                  |           |                 |               |           |         |
| 4                  | 1410-ST. SAVA CHURCH HALL | BROADVIEW HEIGHTS-03-B |   |  |                         |                  |           |                 |               |           |         |
| 5                  | 1410-ST. SAVA CHURCH HALL | BROADVIEW HEIGHTS-03-B |   |  |                         |                  |           |                 |               |           |         |
| 6                  | 1410-ST. SAVA CHURCH HALL | BROADVIEW HEIGHTS-03-B |   |  |                         |                  |           |                 |               |           |         |
| 7                  | 1410-ST. SAVA CHURCH HALL | BROADVIEW HEIGHTS-03-B |   |  |                         |                  |           |                 |               |           |         |
| 8                  | 1410-ST. SAVA CHURCH HALL | BROADVIEW HEIGHTS-03-B |   |  |                         |                  |           |                 |               |           |         |
| 9                  | 1410-ST. SAVA CHURCH HALL | BROADVIEW HEIGHTS-03-B |   |  |                         |                  |           |                 |               |           |         |
| 10                 | 1410-ST. SAVA CHURCH HALL | BROADVIEW HEIGHTS-03-B |   |  |                         |                  |           |                 |               |           |         |
| 11                 | 1410-ST. SAVA CHURCH HALL | BROADVIEW HEIGHTS-03-B |   |  |                         |                  |           |                 |               |           |         |
| 12                 | 1410-ST. SAVA CHURCH HALL | BROADVIEW HEIGHTS-03-B |   |  |                         |                  |           |                 |               |           |         |
| 13                 | 1410-ST. SAVA CHURCH HALL | BROADVIEW HEIGHTS-03-B |   |  |                         |                  |           |                 |               |           |         |
| 14                 | 1410-ST. SAVA CHURCH HALL | BROADVIEW HEIGHTS-03-B |   |  |                         |                  |           |                 |               |           |         |
| 15                 | 1410-ST. SAVA CHURCH HALL | BROADVIEW HEIGHTS-03-B |   |  |                         |                  |           |                 |               |           |         |
| 16                 | 1410-ST. SAVA CHURCH HALL | BROADVIEW HEIGHTS-03-B |   |  |                         |                  |           |                 |               |           |         |

## **Appendix 4**

### **Basic Statistics on DRE Long Report entries**

#### General:

1. The complete sample contained 1,414 unique long reports. The BOE had 5,834 DREs to use on Election Day (although it is unclear if they used them all). If all the available DREs were used, our sample represented 24.2 percent of all long reports.
2. The complete sample contained 132 precincts in 121 polling locations. This represents 9.2 percent of all precincts in the county.
3. The precincts in the complete sample contained 32,062 total votes cast. This represents 8.9 percent of the total votes cast in the county (361,025).
4. In the long report sample, 246 unique long reports (some containing data for more than one precinct in our sample) were not audited at all because those precincts/polling locations were missing some long reports. Without a complete set of long reports for a given precinct, we were unable to audit the existing long reports.
5. This leaves 1,168 unique long reports audited and used in the frequency counts. Some of these long reports contained data for more than one precinct in our sample.

#### Race and total vote matches:

1. 95 precincts matched the GEMS Server for total votes casts and the six candidate total in the three races.
2. Six precincts partially matched the GEMS Server data since the long reports were missing for some of the races audited. The two listed below matched at least one complete race. The other four precincts matched at least one candidate, but not a complete race.
  - Lakewood 3-E, polling location 5650-Westerly Apts. (Barton Ctr) matched in total, state auditor and Supreme Court races. DRE SN 295434 had a tape jam so the results for judicial race were missing for that DRE.
  - East Cleveland 3-D, 4810-Martin Luther King Civic Center matched only the judicial race. DRE SN 254353 was blank for the other races.
3. 31 precincts did not match because of problems with long reports in those polling location.

**Appendix 5**  
**Duplicate DRE Serial Numbers**

1. Two duplicate DREs with different vote counts were found within polling locations.

DRE SN 278596 – Garfield Heights 1D, Polling location 8027-St. Timothy Manor

DRE SN 254886 – Middleburg Heights 4D Polling location 6100-Baptist Mid-Missions

None of the above duplicates were deleted from any reporting. The votes in both duplicate long reports appears to have been loaded into the GEMS server since both are needed for the totals to match the audit totals.

2. One duplicate DRE across polling locations was found.

DRE SN 260368 - Brook Park 1E, Polling location 1460-Brook Park Recreation Center  
Cleveland 3Q, Polling location 2261-Church Of God Of Cleveland

**Appendix 6**  
**2 DREs from the Same Precinct with the Same Serial Number:**  
**Photocopies of Excerpts of 2 Long Reports**  
 (note right column portion, "MACHINE SERIAL")

NO 38  
 \*\*\*\*\*

\*\*\*\*\*  
 \*\* PRECINCT: 7685 \*\*  
 GARFIELD HEIGHTS -01-D  
 \*\*\*\*\*

BALLOTS CAST  
 BALLOT QUANTITY  
 323 62

BALLOTS CAST SUMMARY  
 BLANK VOTED 0  
 UNDERVOTED 0  
 WRITE-IN 0  
 \*\*\*\*\*

Governor and Lieutenant Governor  
 RACE # 10  
 # RUNNING 4  
 # TO VOTE FOR 1

# TIMES COUNTED 62  
 # TIMES BLANK VOTED 0  
 BLACKWELL/RAGA 10  
 FITRAKIS/RIOS 1  
 PEIRCE/NOBLE 0  
 STRICKLAND/FISHER 51  
 WRITE-IN 1 0  
 # WRITE-INS 0  
 \*\*\*\*\*

Attorney General  
 RACE # 20  
 # RUNNING 2  
 # TO VOTE FOR 1

# TIMES COUNTED 62  
 # TIMES BLANK VOTED 13  
 MARC DANN 41  
 BETTY MONTGOMERY 8  
 \*\*\*\*\*

Auditor of State  
 RACE # 30  
 # RUNNING 2  
 # TO VOTE FOR 1

# TIMES COUNTED 62  
 # TIMES BLANK VOTED 9  
 BARBARA SYKES 50  
 MARY TAYLOR 3  
 \*\*\*\*\*

Secretary of State  
 RACE # 40  
 # RUNNING 4  
 # TO VOTE FOR 1

# TIMES COUNTED 62  
 # TIMES BLANK VOTED 8  
 JENNIFER L. BRUNNER 46  
 JOHN A. EASTMAN

\*\*\*\*\*  
 ELECTION RESULTS REPORT  
 \*\*\*\*\*  
 CUYAHOGA COUNTY

NOVEMBER 7, 2006

GENERAL ELECTION  
 DATE: Nov-07-2006  
 POLL CTR: 4955D00  
 ST. TIMOTHY MANOR  
 MACHINE ID: 3  
 VERSION: 2 COPY: 0  
 COUNT: 0 SIZE: 32M  
 ACCU-VOTE RELEASE: 4, 6, 4  
 REPORT: US 1, 15

TIME: 19:01 11/06/2006  
 MACHINE SERIAL: 278596  
 PUBLIC COUNTER: 64  
 SYSTEM COUNTER: 94

\*\*\*\*\*  
 \*\*\* SUMMARY TOTALS  
 \*\*\*\*\*

BALLOTS CAST BY PRECINCT  
 PRECINCT 7685  
 BALLOT QUANTITY  
 323 62  
 PRECINCT 7695  
 BALLOT QUANTITY  
 324 2

BALLOTS CAST SUMMARY  
 BLANK VOTED 0  
 UNDERVOTED 0  
 WRITE-IN 0  
 TOTAL BALLOTS 64

\*\*\*\*\*  
 Governor and Lieutenant Governor  
 RACE # 10  
 # RUNNING 4  
 # TO VOTE FOR 1

# TIMES COUNTED 64  
 # TIMES BLANK VOTED 0  
 BLACKWELL/RAGA 10  
 FITRAKIS/RIOS 1  
 PEIRCE/NOBLE 0  
 STRICKLAND/FISHER 53  
 WRITE-IN 1 0  
 # WRITE-INS 0

NO 21  
\*\*\*\*\*

\*\*\*\*\*  
\*\* PRECINCT: 7685 \*\*  
GARFIELD HEIGHTS -01-D  
\*\*\*\*\*

BALLOTS CAST  
BALLOT QUANTITY  
323 57

BALLOTS CAST SUMMARY  
BLANK VOTED 0  
UNDervOTED 0  
WRITE-IN 0  
\*\*\*\*\*  
Governor and Lieutenant Governor  
RACE # 10 4  
# RUNNING 1  
# TO VOTE FOR

# TIMES COUNTED 57  
# TIMES BLANK VOTED 0  
BLACKWELL/RAGA 2  
FITRAKIS/RIOS 2  
PEIRCE/NOBLE 0  
STRICKLAND/FISHER 53  
WRITE-IN 1 0  
# WRITE-INS 0  
\*\*\*\*\*  
Attorney General  
RACE # 20 2  
# RUNNING 1  
# TO VOTE FOR

# TIMES COUNTED 57  
# TIMES BLANK VOTED 10  
MARC DANN 42  
BETTY MONTGOMERY 5  
\*\*\*\*\*  
Auditor of State  
RACE # 30 2  
# RUNNING 1  
# TO VOTE FOR

# TIMES COUNTED 57  
# TIMES BLANK VOTED 6  
BARBARA SYKES 47  
MARY TAYLOR 4  
\*\*\*\*\*  
Secretary of State  
RACE # 40 4  
# RUNNING 1  
# TO VOTE FOR

# TIMES COUNTED 57  
# TIMES BLANK VOTED 4

\*\*\*\*\*  
ELECTION RESULTS REPORT  
\*\*\*\*\*  
CUYAHOGA COUNTY

NOVEMBER 7, 2006

GENERAL ELECTION  
DATE: Nov-07-2006  
POLL CTR: 4955C00  
ST, TIMOTHY MANOR 2  
MACHINE ID: 2  
VERSION: 2 COPY: 0  
COUNT: 0 SIZE: 32M  
ACCU-VOTE RELEASE: 4,6,4  
REPORT: US 1, 15

TIME: 18:46 11/06/2006  
MACHINE SERIAL: 278596  
PUBLIC COUNTER: 58  
SYSTEM COUNTER: 94

\*\*\*\*\*  
\*\*\* SUMMARY TOTALS  
\*\*\*\*\*

BALLOTS CAST BY PRECINCT  
PRECINCT 7685  
BALLOT QUANTITY  
323 57  
PRECINCT 7695  
BALLOT QUANTITY  
324 1

BALLOTS CAST SUMMARY  
BLANK VOTED 0  
UNDervOTED 0  
WRITE-IN 0  
TOTAL BALLOTS 58

\*\*\*\*\*  
# RUNNING  
RACE # 280  
2 21978 Issue  
\*\*\*\*\*  
# TIMES COUNTED 52  
# TIMES BLANK VOTED  
AVID LYNCH  
T. MASON  
\*\*\*\*\*  
ative 12th

**Appendix 7. All Unmatched Precincts**

| Id | First Line | Polling_Place_Name                   | Precinct_Name            | Difference (Audit minus GEMS) |           |          |       |        |         |           | Partial Matches                | Comments                                   |
|----|------------|--------------------------------------|--------------------------|-------------------------------|-----------|----------|-------|--------|---------|-----------|--------------------------------|--|
|    |            |                                      |                          | Votes Cast                    | Gallagher | Hastings | Sykes | Taylor | O_Neill | O_Donnell |                                |  |
| 1  | 31         | 50-BROOK PARK RECREATION CENTER      | BROOK PARK -01-E         | -81                           | -34       | -20      | -49   | -30    | -28     | -37       | no                             | Missing parts of long reports              |
| 2  | 157        | 3980-CLEVELAND KOREAN PRESB. CHURCH  | CLEVELAND -16-P          |                               |           |          |       |        |         |           | no                             | Missing several long reports               |
| 3  | 158        | 3980-CLEVELAND KOREAN PRESB. CHURCH  | CLEVELAND -16-Q          |                               |           |          |       |        |         |           | no                             | Missing several long reports               |
| 4  | 189        | 5400-GATES MILLS COMMUNITY HOUSE     | GATES MILLS -00-B        |                               |           |          |       |        |         |           | no                             | All long reports missing for this precinct |
| 5  | 201        | 7220-ST. MARGARET MARY CHURCH HALL   | SOUTH EUCLID -01-C       | -17                           | -9        | -2       | -8    | -7     | -8      | -7        | no                             | Missing several long reports               |
| 6  | 225        | 1120-BEACHWOOD HIGH SCHOOL           | BEACHWOOD -00-F          |                               |           |          |       |        |         |           | no                             | Missing several long reports               |
| 7  | 295        | 6700-JOHN MUIR ELEMENTARY SCHOOL     | PARMA -04-A              | -3                            | 0         | -3       | -2    | -1     | 0       | -2        | Partial, but not the same race | Missing one long reports                   |
| 8  | 308        | 1170-COLUMBUS INTERMEDIATE SCHOOL    | BEDFORD HEIGHTS -03-C    |                               |           |          |       |        |         |           | no                             | Missing several long reports               |
| 9  | 458        | 6090-MIDDLEBURG HTS. CHURCH OF GOD   | MIDDLEBURG HEIGHTS -04-A | -277                          | -74       | -100     | -94   | -137   | -70     | -128      | no                             | Missing several long reports               |
| 10 | 464        | 7830-ST. JUDE PARISH HALL            | WARRENSVILLE HTS -07-B   |                               |           |          |       |        |         |           | no                             | Missing several long reports               |
| 11 | 516        | 7580-HIGH POINT RECREATION CENTER    | STRONGSVILLE -02-I       | -1                            | -11       | -24      | 0     | -1     | 0       | -1        | Partial, but not the same race | Torn long reports                          |
| 12 | 571        | 4990-OUR LADY OF LOURDES SHRINE      | EUCLID -04-B             |                               |           |          |       |        |         |           | no                             | Missing several long reports               |
| 13 | 698        | 3012-ZION CHAPEL(MISS BAPT ANNEX)    | CLEVELAND -01-U          | -24                           | -12       | -1       | -17   | -2     | -8      | -9        | no                             | Missing several long reports               |
| 14 | 718        | 6130-ST. WENCESLAS SCHOOL            | MAPLE HEIGHTS -04-C      |                               |           |          |       |        |         |           | no                             | Missing several long reports               |
| 15 | 719        | 6130-ST. WENCESLAS SCHOOL            | MAPLE HEIGHTS -04-D      |                               |           |          |       |        |         |           | no                             | Missing several long reports               |
| 16 | 773        | 3040-CUDELL RECREATION CENTER        | CLEVELAND -18-I          |                               |           |          |       |        |         |           | no                             | Missing several long reports               |
| 17 | 796        | 5650-WESTERLY APTS. (BARTON CTR)     | LAKEWOOD -03-E           | 0                             | -5        | -2       | 0     | 0      | 0       | 0         | Partial                        | Printer jam couldn't read two races        |
| 18 | 842        | 8024-FIFTH CHRISTIAN CHURCH          | CLEVELAND -01-B          | -2                            | 0         | -1       | -2    | 0      | 0       | -1        | Partial, but not the same race | precinct missing on long report            |
| 19 | 916        | 2440-ST. MARTIN DEPORRES CENTER      | CLEVELAND -09-K          |                               |           |          |       |        |         |           | no                             | Missing several long reports               |
| 20 | 936        | 5710-LINCOLN ELEMENTARY SCHOOL       | LAKEWOOD -02-H           | -190                          | -58       | -74      | -101  | -72    | -79     | -79       | no                             | Missing several long reports               |
| 21 | 937        | 5710-LINCOLN ELEMENTARY SCHOOL       | LAKEWOOD -02-I           | -6                            | -2        | -1       | -6    | 0      | -3      | -3        | Partial, but not the same race | Missing several long reports               |
| 22 | 980        | 4220-GLENVILLE HIGH SCHOOL           | CLEVELAND -09-E          | -189                          | -71       | -47      | -162  | -8     | -79     | -71       | no                             | Missing 1 long reports                     |
| 23 | 985        | 4860-TERRACE TOWERS                  | EAST CLEVELAND -04-E     |                               |           |          |       |        |         |           | no                             | Missing several long reports               |
| 24 | 990        | 2265-BOYS & GIRLS CLUB OF CLEVELAND  | CLEVELAND -03-L          |                               |           |          |       |        |         |           | no                             | Missing several long reports               |
| 25 | 1013       | 2420-CAPTAIN ARTHUR ROTH SCHOOL      | CLEVELAND -09-F          |                               |           |          |       |        |         |           | no                             | Missing several long reports               |
| 26 | 1027       | 6535-SENIOR CITIZENS CENTER BLDG-G   | OAKWOOD -05-A            | -83                           | -36       | -12      | -61   | -14    | -32     | -23       | no                             | printer problems                           |
| 27 | 1097       | 4500-SIMPSON UN'D METHODIST CHURCH   | CLEVELAND -18-R          |                               |           |          |       |        |         |           | no                             | Missing all long reports                   |
| 28 | 1107       | 4280-IMMACULATE HEART OF MARY        | CLEVELAND -12-D          | -37                           | -14       | -17      | -24   | -9     | -13     | -19       | no                             | Missing 1 long report                      |
| 29 | 1153       | 6710-RIDGEBROOK ELEMENTARY SCHOOL    | PARMA -01-G              |                               |           |          |       |        |         |           | no                             | Missing several long reports               |
| 30 | 1194       | 2360-EVERLASTING BAPTIST CHURCH      | CLEVELAND -10-J          |                               |           |          |       |        |         |           | no                             | Missing 1/2 of a long report               |
| 31 | 1206       | 4810-MARTIN LUTHER KING CIVIC CENTER | EAST CLEVELAND -03-D     | -17                           | 0         | 0        | -12   | -2     | -11     | -3        | Partial                        | Blank tape for auditor and supreme court   |
| 32 | 1328       | 6580-ORANGE VILLAGE HALL             | ORANGE -00-C             | -11                           | -4        | -13      | -5    | -4     | -5      | -5        | no                             | Missing 1 long report                      |
| 33 | 1380       | 8018-PEARLBROOK CHURCH OF GOD        | CLEVELAND -16-S          |                               |           |          |       |        |         |           | no                             | Missing all long reports                   |
| 34 | 1419       | 2300-ALEXANDER G. BELL ELEM. SCHOOL  | CLEVELAND -06-S          | -58                           | -28       | -12      | -50   | -3     | -43     | -35       | no                             | Missing 1 long report                      |
| 35 | 1527       | 2080-GREATER ABYSSINIA TOWERS        | CLEVELAND -08-O          |                               |           |          |       |        |         |           | no                             | Missing several long reports               |
| 36 | 1546       | 4290-WESTSIDE SACHSENHEIM HALL       | CLEVELAND -16-A          |                               |           |          |       |        |         |           | no                             | Missing several long reports               |
| 37 | 1547       | 4290-WESTSIDE SACHSENHEIM HALL       | CLEVELAND -16-C          |                               |           |          |       |        |         |           | no                             | Missing several long reports               |

Note: Those precincts with blanks (no differences recorded) did not have completed audits because long report problems were identified at the beginning and auditors knew they would not have sufficient information to do a comparison with GEMS data.

**Appendix 8**  
**Discrepancies between PDF and sum of CSV files for unofficial results**  
**(128 precincts)**

| Difference - Unofficial PDF results minus combined CSV results |            |       |        |           |          |           |         |
|--|------------|-------|--------|-----------|----------|-----------|---------|
| Precinct   | Cards Cast | Sykes | Taylor | Gallagher | Hastings | O'Donnell | O'Neill |
| BEACHWOOD -00-D  | 1          | 0     | 0      | 0         | 1        | 0         | 1       |
| BEACHWOOD -00-H  | 1          | 1     | 0      | 0         | 1        | 1         | 0       |
| BEACHWOOD -00-K  | 1          | 1     | 0      | 1         | 0        | 0         | 1       |
| BEDFORD -01-A  | 1          | 1     | 0      | 0         | 0        | 1         | 0       |
| BEDFORD -03-A  | 3          | 2     | 1      | 2         | 0        | 0         | 1       |
| BEREA -02-A  | 1          | 0     | 1      | 0         | 1        | 1         | 0       |
| BRECKSVILLE -00-E  | 2          | 0     | 1      | 0         | 2        | 2         | 0       |
| BRECKSVILLE -00-L  | 1          | 0     | 0      | 0         | 0        | 0         | 0       |
| BROOKLYN -00-A   | 1          | 0     | 1      | 0         | 1        | 0         | 1       |
| BROOKLYN -00-C   | 2          | 1     | 0      | 1         | 0        | 1         | 1       |
| BROOKLYN -00-F   | 1          | 1     | 0      | 1         | 0        | 0         | 1       |
| BROOKLYN -00-G   | 2          | 2     | 0      | 1         | 1        | 1         | 1       |
| BROOK PARK -01-A   | 1          | 1     | 0      | 1         | 0        | 0         | 1       |
| BROOK PARK -01-B   | 1          | 0     | 1      | 0         | 1        | 1         | 0       |
| BROOK PARK -01-C   | 1          | 1     | 0      | 0         | 0        | 0         | 0       |
| BROOK PARK -02-A   | 1          | 0     | 1      | 0         | 1        | 0         | 1       |
| BROOK PARK -02-C   | 1          | 0     | 1      | 0         | 1        | 1         | 0       |
| BROOK PARK -04-A   | 1          | 0     | 1      | 0         | 1        | 1         | 0       |
| CLEVELAND -01-D  | 1          | 1     | 0      | 0         | 1        | 0         | 1       |
| CLEVELAND -01-F  | 1          | 1     | 0      | 1         | 0        | 0         | 1       |
| CLEVELAND -01-N  | 1          | 1     | 0      | 1         | 0        | 0         | 1       |
| CLEVELAND -01-P  | 1          | 1     | 0      | 0         | 0        | 0         | 1       |
| CLEVELAND -02-A  | 1          | 1     | 0      | 0         | 0        | 1         | 0       |
| CLEVELAND -02-I  | 1          | 1     | 0      | 0         | 0        | 0         | 1       |
| CLEVELAND -02-S  | 5          | 5     | 0      | 0         | 1        | 0         | 2       |
| CLEVELAND -03-B  | 1          | 1     | 0      | 0         | 1        | 1         | 0       |
| CLEVELAND -03-R  | 1          | 0     | 0      | 0         | 0        | 0         | 0       |
| CLEVELAND -05-J  | 1          | 0     | 1      | 1         | 0        | 1         | 0       |
| CLEVELAND -05-L  | 1          | 1     | 0      | 1         | 0        | 0         | 1       |
| CLEVELAND -05-M  | 1          | 1     | 0      | 0         | 0        | 1         | 0       |
| CLEVELAND -05-N  | 1          | 1     | 0      | 0         | 0        | 0         | 0       |
| CLEVELAND -05-R  | 1          | 1     | 0      | 1         | 0        | 0         | 1       |
| CLEVELAND -08-E  | 1          | 1     | 0      | 1         | 0        | 0         | 1       |
| CLEVELAND -08-R  | 1          | 0     | 0      | 0         | 1        | 1         | 0       |
| CLEVELAND -09-F  | 1          | 1     | 0      | 1         | 0        | 1         | 0       |
| CLEVELAND -09-G  | 1          | 1     | 0      | 1         | 0        | 0         | 1       |
| CLEVELAND -09-J  | 1          | 1     | 0      | 0         | 0        | 1         | 0       |
| CLEVELAND -09-K  | 1          | 1     | 0      | 0         | 0        | 0         | 1       |

|                         |   |   |   |   |   |   |   |
|-------------------------|---|---|---|---|---|---|---|
| CLEVELAND -10-M         | 1 | 1 | 0 | 1 | 0 | 0 | 0 |
| CLEVELAND -10-Q         | 1 | 1 | 0 | 1 | 0 | 1 | 0 |
| CLEVELAND -11-J         | 2 | 1 | 0 | 1 | 0 | 1 | 0 |
| CLEVELAND -13-E         | 1 | 1 | 0 | 1 | 0 | 1 | 0 |
| CLEVELAND -13-X         | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| CLEVELAND -15-E         | 1 | 1 | 0 | 0 | 1 | 1 | 0 |
| CLEVELAND -16-D         | 1 | 1 | 0 | 1 | 0 | 1 | 0 |
| CLEVELAND -16-Q         | 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| CLEVELAND -16-R         | 1 | 1 | 0 | 0 | 0 | 0 | 1 |
| CLEVELAND -17-G         | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| CLEVELAND -18-D         | 1 | 1 | 0 | 1 | 0 | 1 | 0 |
| CLEVELAND -19-C         | 1 | 1 | 0 | 0 | 0 | 0 | 1 |
| CLEVELAND -19-D         | 2 | 2 | 0 | 0 | 0 | 0 | 2 |
| CLEVELAND -20-A         | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| CLEVELAND -20-N         | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| CLEVELAND -21-A         | 1 | 0 | 1 | 1 | 0 | 1 | 0 |
| CLEVELAND -21-G         | 1 | 0 | 1 | 1 | 0 | 1 | 0 |
| CLEVELAND -21-P         | 2 | 2 | 0 | 0 | 2 | 0 | 2 |
| CLEVELAND HEIGHTS -01-J | 2 | 1 | 1 | 0 | 1 | 0 | 1 |
| CLEVELAND HEIGHTS -04-D | 1 | 1 | 0 | 1 | 0 | 0 | 1 |
| EAST CLEVELAND -03-G    | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| EUCLID -01-D            | 2 | 0 | 2 | 0 | 2 | 1 | 1 |
| EUCLID -01-M            | 1 | 1 | 0 | 1 | 0 | 0 | 1 |
| EUCLID -03-K            | 1 | 0 | 0 | 0 | 1 | 0 | 0 |
| EUCLID -04-D            | 1 | 0 | 1 | 1 | 0 | 0 | 1 |
| EUCLID -04-I            | 1 | 1 | 0 | 1 | 0 | 0 | 1 |
| GARFIELD HEIGHTS -01-E  | 1 | 1 | 0 | 1 | 0 | 1 | 0 |
| GARFIELD HEIGHTS -02-C  | 1 | 1 | 0 | 1 | 0 | 0 | 1 |
| GARFIELD HEIGHTS -05-C  | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| INDEPENDENCE -00-A      | 1 | 1 | 0 | 1 | 0 | 0 | 1 |
| INDEPENDENCE -00-G      | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| INDEPENDENCE -00-H      | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| LAKWOOD -01-A           | 2 | 0 | 2 | 0 | 0 | 0 | 1 |
| LAKWOOD -01-L           | 1 | 1 | 0 | 1 | 0 | 0 | 1 |
| LAKWOOD -02-K           | 1 | 1 | 0 | 0 | 1 | 1 | 0 |
| LAKWOOD -04-D           | 1 | 1 | 0 | 1 | 0 | 1 | 0 |
| LYNDHURST -02-D         | 1 | 1 | 0 | 1 | 0 | 0 | 1 |
| LYNDHURST -03-A         | 1 | 1 | 0 | 0 | 1 | 1 | 0 |
| LYNDHURST -04-E         | 1 | 0 | 1 | 0 | 1 | 1 | 0 |
| MAPLE HEIGHTS -03-D     | 1 | 0 | 1 | 1 | 0 | 0 | 1 |
| MAPLE HEIGHTS -04-A     | 1 | 1 | 0 | 1 | 0 | 0 | 1 |
| MAPLE HEIGHTS -04-C     | 1 | 1 | 0 | 1 | 0 | 0 | 0 |
| MAPLE HEIGHTS -07-C     | 2 | 1 | 1 | 2 | 0 | 1 | 1 |
| MAYFIELD HEIGHTS -00-B  | 1 | 0 | 1 | 0 | 1 | 0 | 1 |

|                          |   |   |   |   |   |   |   |
|--------------------------|---|---|---|---|---|---|---|
| MAYFIELD HEIGHTS -00-F   | 2 | 1 | 0 | 1 | 0 | 0 | 1 |
| MAYFIELD HEIGHTS -00-M   | 1 | 1 | 0 | 1 | 0 | 0 | 1 |
| MAYFIELD VILLAGE -01-A   | 1 | 0 | 1 | 0 | 1 | 1 | 0 |
| MAYFIELD VILLAGE -03-A   | 1 | 0 | 1 | 0 | 1 | 1 | 0 |
| MIDDLEBURG HEIGHTS -04-C | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| NEWBURGH HEIGHTS -00-A   | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| NORTH OLMSTED -01-B      | 1 | 0 | 1 | 0 | 1 | 1 | 0 |
| NORTH OLMSTED -02-D      | 1 | 1 | 0 | 1 | 0 | 0 | 1 |
| NORTH OLMSTED -04-A      | 2 | 1 | 1 | 2 | 0 | 1 | 1 |
| NORTH OLMSTED -04-G      | 1 | 1 | 0 | 0 | 0 | 1 | 0 |
| NORTH OLMSTED -04-H      | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| NORTH ROYALTON -03-A     | 1 | 0 | 1 | 0 | 1 | 1 | 0 |
| NORTH ROYALTON -03-E     | 2 | 0 | 1 | 0 | 2 | 1 | 0 |
| NORTH ROYALTON -05-C     | 1 | 0 | 1 | 0 | 0 | 1 | 0 |
| OLMSTED TOWNSHIP -00-B   | 2 | 1 | 1 | 0 | 1 | 0 | 1 |
| PARMA -01-C              | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| PARMA -01-E              | 1 | 1 | 0 | 1 | 0 | 0 | 1 |
| PARMA -02-A              | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| PARMA -03-A              | 1 | 1 | 0 | 1 | 0 | 0 | 1 |
| PARMA -03-J              | 1 | 1 | 0 | 1 | 0 | 0 | 1 |
| PARMA -04-C              | 1 | 1 | 0 | 1 | 0 | 0 | 1 |
| PARMA -05-D              | 1 | 1 | 0 | 1 | 0 | 0 | 1 |
| PARMA -06-D              | 1 | 0 | 1 | 0 | 1 | 1 | 0 |
| PARMA -07-G              | 1 | 0 | 1 | 0 | 0 | 0 | 1 |
| PARMA -08-E              | 1 | 0 | 1 | 0 | 1 | 1 | 0 |
| PARMA -09-E              | 1 | 1 | 0 | 1 | 0 | 0 | 1 |
| PEPPER PIKE -00-B        | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| PEPPER PIKE -00-D        | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| PEPPER PIKE -00-F        | 3 | 2 | 1 | 1 | 2 | 0 | 3 |
| ROCKY RIVER -02-F        | 2 | 1 | 1 | 1 | 1 | 1 | 1 |
| ROCKY RIVER -03-B        | 1 | 0 | 0 | 0 | 1 | 1 | 0 |
| SEVEN HILLS -01-C        | 1 | 1 | 0 | 1 | 0 | 0 | 1 |
| SEVEN HILLS -03-C        | 1 | 1 | 0 | 1 | 0 | 0 | 1 |
| SHAKER HEIGHTS -00-JJ    | 1 | 0 | 0 | 0 | 1 | 1 | 0 |
| SOLON -01-C              | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| SOLON -02-B              | 1 | 1 | 0 | 0 | 0 | 0 | 1 |
| SOLON -03-C              | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| SOUTH EUCLID -02-G       | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| STRONGSVILLE -04-C       | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| UNIVERSITY HEIGHTS -00-F | 1 | 1 | 0 | 1 | 0 | 1 | 0 |
| UNIVERSITY HEIGHTS -00-M | 2 | 2 | 0 | 1 | 1 | 0 | 2 |
| WESTLAKE -02-C           | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| WESTLAKE -02-D           | 1 | 1 | 0 | 1 | 0 | 1 | 0 |

|                    |     |    |    |    |    |    |    |
|--------------------|-----|----|----|----|----|----|----|
| WESTLAKE -04-B     | 1   | 1  | 0  | 0  | 1  | 0  | 1  |
| WESTLAKE -05-E     | 1   | 0  | 1  | 1  | 0  | 1  | 0  |
| WESTLAKE -05-F     | 1   | 0  | 1  | 0  | 0  | 0  | 0  |
| Total              | 152 | 91 | 42 | 58 | 50 | 48 | 72 |
| Maximum difference | 5   | 5  | 2  | 2  | 2  | 2  | 3  |
| Minimum difference | 1   | 0  | 0  | 0  | 0  | 0  | 0  |

**Appendix 9 Form (example) Used to Audit the Optical Scan Ballots**

|  |               |                 |  |                    |             |                    |
|--|---------------|-----------------|--|--------------------|-------------|--------------------|
| Page 1 of 1  | City_precinct | Batch Count 143 | GEMS Count 143                             | Recorder: Jane Doe | Date 13-Dec | Ending Time 2:30pm |
| If you mistakenly check a cell circle it. Then make such a cell solid filled if re-used. |               | 0               | <input checked="" type="checkbox"/> = vote |                    |             |                    |

  

|               | Sykes                               |                                     |                                     |                                     |                                     |                                     |                                     |                                     |                                     |                                     | Taylor                              |                                     |                                     |                                     |                                     |                                     |                                     |                                     |                                     |                                     | No Vote (blank)                     |                                     |                                     |                                     |                                     |                                     |                                     |                                     |                                     |                                     | Cannot Be Determined                |
|---------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
|               | 1                                   | 2                                   | 3                                   | 4                                   | 5                                   | 6                                   | 7                                   | 8                                   | 9                                   | 10                                  | 1                                   | 2                                   | 3                                   | 4                                   | 5                                   | 6                                   | 7                                   | 8                                   | 9                                   | 10                                  | 1                                   | 2                                   | 3                                   | 4                                   | 5                                   | 6                                   | 7                                   | 8                                   | 9                                   | 10                                  | Reason                              |
| 0             | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| 1             | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| 2             | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| 3             | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| 4             | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| 5             | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| 6             | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| 7             | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| 8             | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| 9             | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| 10            | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| 11            | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| 12            | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| 13            | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| 14            | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| 15            | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| 16            | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| 17            | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| 18            | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| 19            | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| 20            | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| 21            | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| 22            | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| 23            | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| 24            | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| <b>TOTAL:</b> |                                     |                                     |                                     |                                     |                                     |                                     |                                     |                                     |                                     | <b>TOTAL:</b>                       |                                     |                                     |                                     |                                     |                                     |                                     |                                     |                                     |                                     | <b>TOTAL:</b>                       |                                     |                                     |                                     |                                     |                                     |                                     |                                     |                                     |                                     | <b>3</b>                            |                                     |
|               |                                     |                                     |                                     |                                     |                                     |                                     |                                     |                                     |                                     |                                     |                                     |                                     |                                     |                                     |                                     |                                     |                                     |                                     |                                     |                                     |                                     |                                     |                                     |                                     |                                     |                                     |                                     |                                     |                                     | <b>ALL: 143</b>                     |                                     |

## Appendix 10 Discrepancies in Optical Scan Hand Count from GEMS report

Group A. The audit hand count results were **lower** than the GEMS reported count in these 16 precincts:

|                               |                 |                  |
|-------------------------------|-----------------|------------------|
| <i>Beachwood 0-E</i>          | <i>-1 Sykes</i> |                  |
| <i>Berea 4-C</i>              |                 | <i>-1 Taylor</i> |
| <i>Brook Park 1C</i>          | <i>-1 Sykes</i> |                  |
| <i>Brook Park 2A</i>          |                 | <i>-1 Taylor</i> |
| <i>Cleveland 14-J</i>         | <i>-1 Sykes</i> |                  |
| <i>Cleveland 17-B</i>         | <i>-1 Sykes</i> |                  |
| <i>East Cleveland 4-H</i>     | <i>-3 Sykes</i> |                  |
| <i>Mayfield Heights 0-I</i>   | <i>-1 Sykes</i> |                  |
| <i>North Olmstead 1-A</i>     | <i>-1 Sykes</i> |                  |
| <i>North Olmstead 4G</i>      | <i>-1 Sykes</i> |                  |
| <i>Olmsted Falls 3-A</i>      | <i>-2 Sykes</i> | <i>-2 Taylor</i> |
| <i>Richmond Heights 3-C</i>   |                 | <i>-1 Taylor</i> |
| <i>Shaker Heights 0-Q</i>     | <i>-1 Sykes</i> |                  |
| <i>South Euclid 2-A</i>       | <i>-1 Sykes</i> |                  |
| <i>University Heights 0-E</i> | <i>-1 Sykes</i> |                  |
| <i>Westlake 2-B</i>           | <i>-1 Sykes</i> |                  |

Group B. The audit hand count results were higher than the GEMS reported count in these 11 precincts:

|                              |                 |                  |
|------------------------------|-----------------|------------------|
| <i>Broadview Heights 1-D</i> | <i>+1 Sykes</i> | <i>+1 Taylor</i> |
| <i>Broadview Heights 2-C</i> | <i>+1 Sykes</i> |                  |
| <i>Cleveland 3-K</i>         | <i>+1 Sykes</i> |                  |
| <i>Cleveland 6-D</i>         | <i>+1 Sykes</i> |                  |
| <i>Cleveland 7-T</i>         | <i>+1 Sykes</i> |                  |
| <i>Cleveland 11-D</i>        | <i>+1 Sykes</i> |                  |
| <i>Highland Hills 0-A</i>    | <i>+1 Sykes</i> | <i>+1 Taylor</i> |
| <i>Lyndhurst 4-C</i>         | <i>+1 Sykes</i> |                  |
| <i>Maple Heights 4-D</i>     |                 | <i>+1 Taylor</i> |
| <i>Rocky River 3-B</i>       | <i>+1 Sykes</i> |                  |
| <i>Seven Hills 4-B</i>       |                 | <i>+1 Taylor</i> |

Group C. The audit hand count results were both higher and lower for the candidates compared to the GEMS reported count in precinct Lyndhurst 1-B with -1 Sykes vote and +1 Taylor vote.

Group D. The GEMS reported count was zero ballots counted and zero votes in precinct North Olmsted 2-F. The folder for OS ballots for this precinct contained ballots (36 for Sykes, 21 for Taylor, and 3 blank).

**Appendix 11**  
**Investigation of Discrepancies in Optical Scan Audit**

Discrepancy Evaluation – Group A

Examination of the Central Count report for information about the 16 precincts with discrepancies of a lower count (Group A) showed that 11 of the precincts had ballot cards filed in an additional location. Such ballot cards would have been included in the GEMS count but because they were not present in the folder at the time of the audit, they would not have been included in the audit tabulation. There appear to be two subgroups in this category. One group has additional ballot cards misfiled as a minor component of another deck in numbers consistent with the numbers of votes missing, i.e., three ballot cards per vote.

Specifically

|                             |                        |                                   |
|-----------------------------|------------------------|-----------------------------------|
| <i>Beachwood 0-E</i>        | <i>1 missing vote</i>  | <i>3 ballot cards wrong deck</i>  |
| <i>Cleveland 14-J</i>       | <i>1 missing vote</i>  | <i>3 ballot cards wrong deck</i>  |
| <i>East Cleveland 4-H</i>   | <i>3 missing votes</i> | <i>9 ballot cards wrong deck</i>  |
| <i>Mayfield Heights 0-I</i> | <i>1 missing vote</i>  | <i>3 ballot cards wrong deck</i>  |
| <i>North Olmstead 1-A</i>   | <i>1 missing vote</i>  | <i>3 ballot cards wrong deck</i>  |
| <i>Olmsted Falls 3-A</i>    | <i>4 missing votes</i> | <i>12 ballot cards wrong deck</i> |
| <i>Richmond Heights 3-C</i> | <i>1 missing vote</i>  | <i>3 ballot cards wrong deck</i>  |
| <i>Shaker Heights 0-Q</i>   | <i>1 missing vote</i>  | <i>3 ballot cards wrong deck</i>  |

The second group has single ballot cards scanned in a deck that consisted of only that single card. The origin of these single card decks is not known.

Specifically

|                          |   |
|--------------------------|---|
| <i>Brook Park 1C</i>     | <i>1 missing vote 1 ballot card solo deck</i> |
| <i>Brook Park 2A</i>     | <i>1 missing vote 1 ballot card solo deck</i> |
| <i>North Olmstead 4G</i> | <i>1 missing vote 1 ballot card solo deck</i> |

These ballot cards were not recovered from their locations nor examined to determine votes marked. The number of ballot cards in all cases was sufficient to account for the number of votes that were missing from the respective precincts.

The discrepancies in the other five precincts in Group A could not be explained by this means since there was no evidence found of ballot cards filed in locations other than the folder examined by the audit.

Discrepancy Evaluation – Group B

Examination of the Central Count report for information about the 11 precincts with discrepancies of a higher count (Group B) showed that six of the precincts had additional ballot cards from other precincts included. These would not have been included in the GEMS count but could possibly have been included in the audit tabulation if they were not recognized and excluded.

Specifically:

|                              |                      |                                |
|------------------------------|----------------------|--------------------------------|
| <i>Broadview Heights 1-D</i> | <i>2 extra votes</i> | <i>4 cards other precincts</i> |
| <i>Broadview Heights 2-C</i> | <i>1 extra votes</i> | <i>3 cards other precincts</i> |
| <i>Cleveland 6-D</i>         | <i>1 extra votes</i> | <i>3 cards other precincts</i> |
| <i>Highland Hills 0-A</i>    | <i>2 extra votes</i> | <i>6 cards other precincts</i> |
| <i>Lyndhurst 4-C</i>         | <i>1 extra votes</i> | <i>3 cards other precincts</i> |
| <i>Rocky River 3-B</i>       | <i>1 extra votes</i> | <i>3 cards other precincts</i> |

During a second follow-up visit to the BOE, these precinct folders were re-examined specifically to determine if the ballot cards from other precincts shown by the Central Count to be present were in fact present and to determine if these ballots had been included in the audit count. In all six of these precinct folders, ballot cards from other precincts were indeed present. In three folders, the original audit count had apparently included the misfiled ballot cards and the discrepancy was resolved when these were excluded. In the other three precincts, the misfiled ballots had apparently been excluded at the time of the original audit (the misfiled ballots were all placed first in each folder) and the re-count results excluding these were the same as those found in the original audit.

The discrepancies in the other five precincts in Group B could not be explained by this means.

Group C - Other Discrepancy Evaluation

The one precinct (Group C; Lyndhurst 1-B ) in which the audit count was one vote high for one candidate and one vote low for the other was also recounted and the results were found to be the same as the original audit count.

NOTE: During this follow-up visit, five other precincts with discrepant results that were not apparently explained or reconcilable by misfiled ballots were examined and re-counted. In all cases the counts were the same as those from the initial audit.

## Appendix 12 Precincts with All or Most Optical Scan Ballots Missing from GEMS

Because we had by chance selected a precinct (North Olmsted 2F) that had OS ballots returned but not recorded in the Central Count Report or on the SOVC report we were aware that this was a possible explanation for no results and no ballots counted. An alternate explanation for zero results would be if there were, in fact, no absentee ballots returned for these precincts. In an attempt to determine if that was the case we determined the number of absentee ballots reported returned for each of these precincts by November 3, 2006, the cutoff time for inclusion in the early absentee scanning. This file was obtained from the BOE (absentee voters for November 2006.csv). Nine of the 11 precincts did not have any absentee ballots returned, but two others did.

As a follow-up, the report of absentee ballots returned was compared to the number of ballots reported in the GEMS report and ballots counted in the Central Count report for all precincts.

Within the limitations of the data and possible errors in the absentee information it appears likely that all or nearly all of the ballots for at least several precincts were not included in the unofficial SOVC. Specifically:

|                            |                                   |               |
|----------------------------|-----------------------------------|---------------|
| <i>Chagrin Falls Twp A</i> | <i>126 voters 11 abs returned</i> | <i>0 SOVC</i> |
| <i>Cleveland 2I</i>        | <i>940 voters 30 abs returned</i> | <i>1 SOVC</i> |
| <i>Cleveland 13X</i>       | <i>920 voters 12 abs returned</i> | <i>1 SOVC</i> |
| <i>North Olmsted 2F</i>    | <i>759 voters 63 abs returned</i> | <i>0 SOVC</i> |

We asked to examine these four decks and were able to examine three of them. One was not able to be found and was not present on the log showing storage location. The documentation on the folders for the three decks examined indicated that these ballots had been scanned during the unofficial count. One of these had a notation "Reject delete" that had been erased but was still readable. It appears that these precincts were deleted from the GEMS tally for some reason. The precinct folders examined contained ballots in numbers corresponding to the number of absentee ballots reported returned.

The procedure during scanning for the unofficial count required verification by the tabulation staff that the number of pages reported on GEMS was within a certain margin of error of the number of pages reported by the scanner. If not within that margin of error the tabulation staff was to delete the batch result from GEMS and the deck was to be rescanned. In these cases, it is possible that after deleting the digital batch from GEMS, the ballots were not rescanned but simply put back in the file. Two precincts each showed one vote in GEMS because there was a single ballot card for each of those precincts present in a deck that consisted of only the single card.

**Appendix 13**  
**BOE Email on Missing Batch in the Unofficial Count**

----- Original Message -----

**Subject:**Missing Batch in the Unofficial Count

**Date:**Fri, 29 Dec 2006 13:28:30 -0800 (PST)

**From:**Frank James Hlad <[fjhlad@yahoo.com](mailto:fjhlad@yahoo.com)>

**To:**Abigail Horn <[abigail@urban.csuohio.edu](mailto:abigail@urban.csuohio.edu)>

We have no evidence of that missing batch in the unofficial count. As we said, it looks as if the batch was scanned, deleted from GEMS, and never re-scanned. Austin had that printout that Kurt was talking about, and the precinct showed no votes cast.

We have been unable to find transaction log information on that day. I am not certain if that's because Matt and Brian don't know where to look or if the log doesn't exist. We did locate a transaction log from the official count, but there was no way to sort or find data within it. It is massive, as you might imagine.

I guess I don't know what to tell you about all this. Your point about dropping a batch in the official count is well taken. Because we can't output data in any usable form from GEMS, we really have no mechanism (except eyeballs) to catch a problem like that. F

**Appendix 14**  
**Differences between files provided by the BOE for Optical Scan Audit**

| run date                 | Title in PDF   | Name of File                                  | Received by Audit | Cards Cast | Sykes  | Taylor |
|--------------------------|--|---|-------------------|------------|--------|--------|
| 11/13/2006<br>(12:48 PM) | Post Absentee/Pre DRE  | gems sovc report post avos - pre tsx.pdf      | 11/13/2006        | 201,290    | 40,194 | 21,059 |
| 11/13/2006               |  | post avos- pre tsx data.csv                   | 11/13/2006        | 201,290    | 40,194 | 21,059 |
| 11/27/2006<br>(7:52 AM)  | filename Official, but data is unofficial, inside the document only titled ABS | GEMS SOVC REPORT official AVOS only 11-06.pdf | 1/31/2007         | 201,595    | 40,321 | 21,068 |
| 1/31/2007<br>(10:54 AM)  | ABS, Unofficial Results  | GEMS SOVC REPORT Unofficial AVOS Only.pdf     | 1/31/2007(?)      | 201,473    | 40,307 | 21,109 |

**Appendix 15**  
**Email Exchange between the Monitor and DESI about GEMS Database**

----- Original Message -----

**Subject:**Database Question posed by the Monitor

**Date:**Fri, 17 Nov 2006 16:28:21 -0500

**From:**Bellis, Chris <BellisC@diebold.com>

**To:**Michael Vu <bempv@cuyahogacounty.us>, Lou Irizarry <belmi@cuyahogacounty.us>, Matthew Jaffe <bemij@cuyahogacounty.us>, Hiner, Jessica <jessicah@dieboldes.com>, Candice Hoke <shoke@law.csuohio.edu>, tryan@law.csuohio.edu

**CC:**Gwen Dillingham <begdx@cuyahogacounty.us>, Green, Pat <GreenP@diebold.com>

Earlier today as a result of the Monitor's Investigation of a GEMS Database [a Monitor software engineer] ran the following SQL statement on a mdb file off of a CD:

```
SELECT SUM(Vote Totals) from candidatecounter WHERE CANDVGROUPID = 1433
```

The resulting value was 186,205.

Then he ran the following statement on the same .mdb file

```
SELECT SUM(Vote Totals) from sumcandidatecounter WHERE CANDVGROUPID = 1433 AND VCENTERID <> -1
```

The resulting value was 186, 027.

Two questions emerged:

1. Why is the value different?
2. Why do we store candidate totals in two different tables?

**ANSWER:**

Chris,

The SumCandidateCounter table is used to store the totals by precinct rather than by counter batch; this was done for performance reasons. The SumCandidateCounter table is updated from the CandidateCounter table when a report is printed whereas the CandidateCounter table is updated when the when the results are posted. Therefore if results had been posted since the last report was printed the totals would not match.

Hope this helps.

Tab

Talbot Iredale, P.Eng,  
Software Development Manager  
Diebold Election Systems

**Appendix 16**  
**Indicators that MAY Show Database Corruption**

(Discovered in the Monitor's Review of CCBOE *Unofficial* Results Database on 11/17/06)<sup>10</sup>

1. Table element entries were missing date/time stamps of when the information was entered.
2. Table element entries had date/time stamps of January 1, 1970, which is the epoch (zero-point) of UNIX time.
3. In an email dated November 3rd, 2006, from DESI's Talbot Iredale, he claimed

"Accounting for transaction overhead, I do not expect the database to grow by more than 100 MB during absentee processing. However this will vary dependent on what other other activities (printing, reports, etc.) occur during the processing."

The database grew to a size greater than 100 MB for absentee processing and a size above 1000 MB for the full election. What happened? Why were the estimations wrong? Precision is very important, especially when dealing with votes. Where else were DESI calculations imprecise?

4. Vote totals in two separate database tables held different values. DESI has provided a response, but as of yet, this response has not been tested or verified.
5. In an email from Chris Bellis dated Monday, November 20, 2006, Mr. Bellis summarized the "large amount of concurrent activity" that was occurring on the GEMS server on election night. This included DRE uploads, the JResults server running, the AVServer running, and Digital Guardian running, all interacting with the database in varying functions. In a subsequent email from Jessica Hiner, dated Sunday, November 26, 2006, Ms. Hiner stated "In the context of an online system with many users, Jet would not be an appropriate choice, but that is not how we use it."
  - It appears in DESI's own words, Hiner acknowledges that when there is a large amount of concurrent activity, Jet database corruption can occur. Chris Bellis has said that on election night, there was a lot of concurrent activity on the server. Taking these two statements together, it would seem very possible that corruption may have occurred.

Microsoft's own documentation has stated that database corruption within JET is unavoidable. This statement is without qualifiers. Normal operation of the Jet database includes corruption.

---

<sup>10</sup> *From a Monitor staff software engineer with substantial database expertise who conducted an initial review of the unofficial election results database with representatives of DESI and the BOE present; the Monitor's review was limited to just over one hour. The resulting information was provided to Project Director Candice Hoke, who then hand-delivered it to the Board Members at the November 2006 certification Board meeting.*

**Appendix 17**  
**Excerpt from Microsoft Documentation on JET-Access Databases**  
(emphasis added)

**Security**

Although Access databases (using the Jet engine) can be password protected and encrypted, **these databases do not have the same level of security** as SQL Server or mainframe database systems. **If data security is critical**, a SQL Server solution is the better choice.... SQL Server allows distributed data in a controlled and highly secure manner.

**Data Integrity**

Similarly, **data integrity and recovery is not as robust on file-based databases using Jet....**

File server **databases using Jet may become corrupt** and require regular maintenance to maintain optimal results. **Even with maintenance, the chance of failure is much higher** than with SQL Server. ....

**Transaction Logs and Rollbacks**

If you need to know who modified what data, and undo changes, SQL Server's built-in features and triggers support this *[but not Access using JET—ed.]*

An Access application can try to replicate the tracking of changes by managing user interaction with the data. However, it would require programming and could not be managed at the core data level. **Mistakes in the application or other applications in contact with the Access data could cause data changes that are not documented.** There are **also no rollbacks** *[opportunities to “undo” the operation—ed.]* **in Access after a transaction is committed.**

The above paragraphs can be found in *Microsoft Access or SQL Server: What's Right in Your Organization?* at

<http://www.microsoft.com/sql/solutions/migration/access/compare-access.mspx>