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August 29, 2023

County Clerk Christine Giordano Hanlon, Esq.  
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CITIZENS' OVERSIGHT PROJECTS  
[CitizensOversight.org](http://CitizensOversight.org)

**AuditEngine**

REF: M2000

E-mail: [ClerkOfElections@co.monmouth.nj.us](mailto:ClerkOfElections@co.monmouth.nj.us)

## Questions Regarding 2022 General Election, Longbranch BOE

Dear Christine Giordano Hanlon:

I hope this message finds you well. I am writing to provide you with a concise overview of the results from our recent ballot image audit using our ballot-image auditing solution, AuditEngine. AuditEngine processes ballot images generated by your voting equipment, conducting an independent tally that is subsequently compared to Cast-Vote Records on a ballot-by-ballot basis.

We were approached by members of the public to conduct a "public oversight" audit encompassing your county, as well as Mercer and Burlington counties in NJ. This presented a unique challenge as we encountered the need to adapt to the specific ballot format utilized in your elections, specifically the ExpressVote XL ballots and landscape grid layout. After updating our code accordingly, we successfully executed an independent audit.

The significance of our audit was underscored by an incident involving the double-uploading of a thumb drive, resulting in the replication of 977 ballot images and associated cast vote records. While we acknowledge that such occurrences can potentially be attributed to human errors, we also recognize the importance of the integrity of the election management system itself. Our analysis revealed that this incident was more aligned with a system-level issue within the ES&S election management system, as it should inherently prevent such instances of double uploading.

However, I would like to draw your attention to a specific anomalous case that merits further discussion. While the final reported results for the contest in question were consistent with the result captured by analyzing images, our examination revealed a discrepancy in the corresponding cast-vote record. We believe that a collaborative discussion on this case could shed light on the underlying factors contributing to this fascinating difference.

However, we have one unusual case we would like to further discuss with you. In this unusual case, your ultimate reported results for the contest were correct, but the cast-vote record was not.

Upon conducting a comprehensive review, we identified inconsistencies within the contest labeled as '**Long Branch Boe / Mbe Local Vote 3 -S Long Branch BOE (4170)**'

This specific contest displayed significant disparities among the Cast-Vote Record (CVR), the Audit results, and the "Official Results." (Note, this is a "Vote for 3" contest.)

1. This election used ES&S ExpressVote XL for in-person voting and used central scanning for mail ballots. There were 231,220 ballots cast after repeated ballots were removed.
2. Aggregated results were provided in the file "summary.csv" from the Monmouth County website. We understand that these aggregated results were posted prior to completion of the hand counts. In some of our reports, we call these aggregated results as "Official Results".
3. There were 977 repeated ballot images in the image data and corresponding records in the CVR. The aggregated results included these additional repeated ballots. We understand that these repeated ballots occurred because one thumb drive was loaded twice to the EMS, resulting in 977 additional repeated ballot images and CVR records. (Note that because we have the digital images, we are able to detect repeated images and we now routinely do so.)
4. Using ballot image data, we were able to find all the repeats and mark 977 repeated ballots to be skipped, while keeping the first 977 ballot images.
5. For those contests involved in the repeated ballot error, those that were smaller contests were hand-counted in full, whereas county-wide contests were partially

counted. Hand counting was performed by the Monmouth County election office.

6. The contest of interest here, 'Long Branch Boe / Mbe Local Vote 3 -S Long Branch BOE (4170)', was not involved in the repeated ballot error, and it was not (to our knowledge) hand-counted, as there were no hand-counting results published to the Monmouth County website.
7. The contest "Long Branch Boe / Mbe Local Vote 3 -S Long Branch BOE (4170)" was flagged in our contest review. In this comparison, we compare each ballot image, as interpreted by our software, with the cast-vote record (CVR) as provided in the data provided. The high-level comparison results are summarized in this table:

(image of the table)

Total	Agreed & NonVariant	Agreed Overvotes	Agreed Write-ins	No CVR	Gray Only	Disagreed	All Variants	Disagreed% of Margin	Variant% of Margin	Vote Margin	Margin%
5,919	4,775	20	6	0	127	747	1,144	276.67%	423.70%	270	2.61%

8. Of the total of 5921 ballots involved in the contest
  - a. 2 were left out of this comparison because they were not fully extracted by our software. However, this has been corrected and they are now included. If the total is 5919 above, then they were not included in this summary. These 2 ballots were both BMD ballots and they were not involved in this inconsistency.
  - b. 4,775 were classified as Agreed and NonVariant, meaning that the AuditEngine audit result completely agreed on those ballots with the result as listed in the CVR, and in addition, those ballots had no overvotes, writeins, or gray flags. With the two ballots initially not interpreted, this number will be 4,777.
  - c. The balance, 1,144, were classified as "All Variants", including 20 agreed overvotes, 6 agreed writeins, 127 gray flags, and most importantly, 747 were classified as disagreed.
  - d. This disagreed count is 276% of the official margin of victory of 270 votes (2.61%). Since this is a vote-for 3 contest, the margin of interest is between the 3rd and 4th place finisher. Therefore, this issue is of concern

as it may alter the outcome.

9. The overall contest summary is shown below.

The CVR lists Caroline BENNETT as the overall leader with 2030 votes, followed by Thresa DANGLER with 2,000 votes, and then Rick Garlipp with 1607 votes. The CVR listing can be seen in the leftmost column in the right table.

AuditEngine and the aggregated results agree that Theresa DANGLER received 2410 votes, Rick Garlipp received 1896 votes, and Avery Grant took third place with 1588 votes.

Contest: Long Branch Boe / Mbe Local Vote 3 -S Long Branch BOE (4170)							
parameter	CVR	Diff	Audit	Diff	Official Results	CVR share	
overvotes	1	19	20	-20	0		
undervotes	7,415	-961	6,454	-6454	0		
num_ballots	5,921	-2	5,919	7	5,926		
writeins	73	0	73	6	79		
tot_votes	10,345	898	11,243	12	11,255		
margin	270		95		99		
winners	['Caroline BENNETT (246)', 'Theresa DANGLER (242)', 'Rick GARLIPP (243)']		['Theresa DANGLER (242)', 'Rick GARLIPP (243)', 'Avery W. GRANT (245)']		['Theresa DANGLER (242)', 'Rick GARLIPP (243)', 'Avery W. GRANT (245)']		
	option	CVR	Diff	Audit	Diff	Official Results	CVR share
	Caroline BENNETT (246)	2,030	-538	1,492	-3	1,489	19.6%
	Theresa DANGLER (242)	2,000	409	2,409	1	2,410	19.3%
	Rick GARLIPP (243)	1,607	289	1,896	0	1,896	15.5%
	David A. BROWN (244)	1,337	23	1,360	4	1,364	12.9%
	Avery W. GRANT (245)	1,272	315	1,587	1	1,588	12.3%
	Alisa Dawn ARMOUR (241)	1,170	222	1,392	1	1,393	11.3%
	NP5 Dominic Rosario SAMA (247)	856	178	1,034	2	1,036	8.3%

10. The entire discrepancy report for this contest can be viewed at this URL. It may have had some minor updates since this letter.

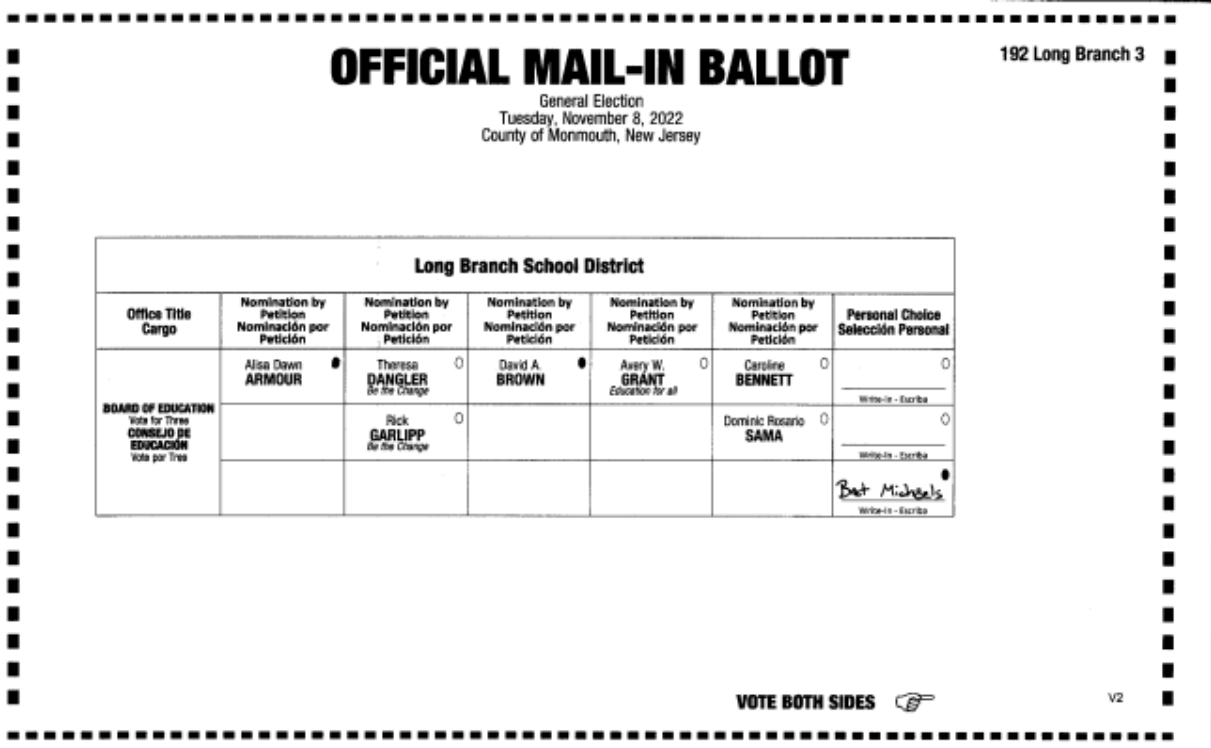
[https://us-east-1-audit-engine-jobs.s3.amazonaws.com/US/NJ/US\\_NJ\\_Monmouth\\_20221108/reports/Discrepancy\\_Report.html#contest-long-branch-boe-mbe-local-vote-3-s-long-branch-boe-4170](https://us-east-1-audit-engine-jobs.s3.amazonaws.com/US/NJ/US_NJ_Monmouth_20221108/reports/Discrepancy_Report.html#contest-long-branch-boe-mbe-local-vote-3-s-long-branch-boe-4170)

11. Many of the 747 disagreed ballots were carefully reviewed, including manual review of the raw data provided by the county and not relying on AuditEngine to provide the images or data. These were all consistent with the report in AuditEngine.

12. A number of ballots will be reviewed in examples here.

**Ballot #7263**, when reviewed by AuditEngine resolved votes for Alisa Dawn ARMOUR, David A. BROWN, and one writein. Total votes were 3.

When viewing the image, that corresponds to the actual vote shown in the image. The write-in is apparently for Bret Michaels.



The CVR shows a vote for Caroline BENNETT (246) and David A. BROWN (244), and one undervote.

To confirm the CVR matches our report, we looked at the original CVR file as posted by the Monmouth County Elections Dept.

The CVR record for this ballots is in the first CVR file. In this case, we will pull this record directly out of the .xlsx file to show correspondence with the record provided in the AuditEngine report. As you see, the CVR lists David A. BROWN and Caroline BENNETT, and one undervote.

Cast Vote Record	Loch Arbour Board of Ec	Long Branch Boe / Mbe	Local Vote 3 -S Long Branch BOE (4170)	M
7261		Caroline BENNETT (246)	undervote	undervote
7262		Caroline BENNETT (246)	undervote	undervote
7263		David A. BROWN (244)	Caroline BENNETT (246)	undervote
7264		Caroline BENNETT (246)	undervote	undervote

13. The original CVR record agrees with the report of that record by AuditEngine, and it differs from the actual vote.

14. In fact, as we look at the set of ballots that are contiguous in the CVR, we see ballots from 7224 to 7300 (inclusive -- 77 ballots) that are all unusual in the fact that there are only three vote patterns:

- a. most are votes for "Caroline BENNETT" with two undervotes,
- b. then second most prevalent are all undervotes,
- c. and the rest are votes for "David A. BROWN" and "Caroline BENNETT"

7223			
7224	Caroline BENNETT (246)	<u>undervote</u>	<u>undervote</u>
7225	Caroline BENNETT (246)	<u>undervote</u>	<u>undervote</u>
7226	Caroline BENNETT (246)	<u>undervote</u>	<u>undervote</u>
7227	David A. BROWN (244)	Caroline BENNETT (246)	<u>undervote</u>
7228	Caroline BENNETT (246)	<u>undervote</u>	<u>undervote</u>
7229	<u>undervote</u>	<u>undervote</u>	<u>undervote</u>
7230	<u>undervote</u>	<u>undervote</u>	<u>undervote</u>
7231	David A. BROWN (244)	Caroline BENNETT (246)	<u>undervote</u>
7232	<u>undervote</u>	<u>undervote</u>	<u>undervote</u>
7233	<u>undervote</u>	<u>undervote</u>	<u>undervote</u>
7234	Caroline BENNETT (246)	<u>undervote</u>	<u>undervote</u>
7235	Caroline BENNETT (246)	<u>undervote</u>	<u>undervote</u>
7236	Caroline BENNETT (246)	<u>undervote</u>	<u>undervote</u>
7237	Caroline BENNETT (246)	<u>undervote</u>	<u>undervote</u>
7238	<u>undervote</u>	<u>undervote</u>	<u>undervote</u>
7239	Caroline BENNETT (246)	<u>undervote</u>	<u>undervote</u>
7240	Caroline BENNETT (246)	<u>undervote</u>	<u>undervote</u>
7241	<u>undervote</u>	<u>undervote</u>	<u>undervote</u>
7242	Caroline BENNETT (246)	<u>undervote</u>	<u>undervote</u>
7243	Caroline BENNETT (246)	<u>undervote</u>	<u>undervote</u>
7244	Caroline BENNETT (246)	<u>undervote</u>	<u>undervote</u>
7245	Caroline BENNETT (246)	<u>undervote</u>	<u>undervote</u>
7246	Caroline BENNETT (246)	<u>undervote</u>	<u>undervote</u>
7247	Caroline BENNETT (246)	<u>undervote</u>	<u>undervote</u>
7248	David A. BROWN (244)	Caroline BENNETT (246)	<u>undervote</u>
7249	<u>undervote</u>	<u>undervote</u>	<u>undervote</u>
7250	Caroline BENNETT (246)	<u>undervote</u>	<u>undervote</u>
7251	<u>undervote</u>	<u>undervote</u>	<u>undervote</u>
7252	<u>undervote</u>	<u>undervote</u>	<u>undervote</u>
7253	David A. BROWN (244)	Caroline BENNETT (246)	<u>undervote</u>
7254	Caroline BENNETT (246)	<u>undervote</u>	<u>undervote</u>
7255	Caroline BENNETT (246)	<u>undervote</u>	<u>undervote</u>
7256	Caroline BENNETT (246)	<u>undervote</u>	<u>undervote</u>
7257	Caroline BENNETT (246)	<u>undervote</u>	<u>undervote</u>
7258	Caroline BENNETT (246)	<u>undervote</u>	<u>undervote</u>

whereas, the sample below shows a more typical pattern which has much more variation:

d	Loch Arbour Board of Ed	Long Branch Boe / Mbe	Local Vote 3 -S	Long Branch BOE (4170)	Manalapan -
32898					
32899		Alisa Dawn ARMOUR (2)	Theresa DANGLER (242)	Rick GARLIPP (243)	
32900		undervote	undervote	undervote	
32901		undervote	undervote	undervote	
32902		Theresa DANGLER (242)	Caroline BENNETT (246)	NP5 Dominic Rosario SAMA (247)	
32903					
32904		Alisa Dawn ARMOUR (2)	David A. BROWN (244)	Avery W. GRANT (245)	
32905		Theresa DANGLER (242)	David A. BROWN (244)	Avery W. GRANT (245)	
32906					
32907		undervote	undervote	undervote	
32908		Alisa Dawn ARMOUR (2)	Avery W. GRANT (245)	NP5 Dominic Rosario SAMA (247)	
32909		Rick GARLIPP (243)	NP5 Dominic Rosario SAMA	undervote	
32910		Theresa DANGLER (242)	Rick GARLIPP (243)	undervote	
32911					
32912		Theresa DANGLER (242)	David A. BROWN (244)	NP5 Dominic Rosario SAMA (247)	
32913		Alisa Dawn ARMOUR (2)	Avery W. GRANT (245)	NP5 Dominic Rosario SAMA (247)	
32914					
32915		Alisa Dawn ARMOUR (2)	Theresa DANGLER (242)	Rick GARLIPP (243)	
32916		Alisa Dawn ARMOUR (2)	Theresa DANGLER (242)	Rick GARLIPP (243)	
32917		Theresa DANGLER (242)	Rick GARLIPP (243)	Caroline BENNETT (246)	
32918		Theresa DANGLER (242)	Rick GARLIPP (243)	Avery W. GRANT (245)	
32919					
32920		David A. BROWN (244)	Caroline BENNETT (246)	NP5 Dominic Rosario SAMA (247)	
32921		Alisa Dawn ARMOUR (2)	Caroline BENNETT (246)	undervote	
32922		Alisa Dawn ARMOUR (2)	Theresa DANGLER (242)	Caroline BENNETT (246)	
32923		undervote	undervote	undervote	
32924		Theresa DANGLER (242)	Rick GARLIPP (243)	Avery W. GRANT (245)	
32925		Avery W. GRANT (245)	Caroline BENNETT (246)	NP5 Dominic Rosario SAMA (247)	
32926		Theresa DANGLER (242)	Rick GARLIPP (243)	Avery W. GRANT (245)	
32927					
32928					
32929		Theresa DANGLER (242)	Avery W. GRANT (245)	Caroline BENNETT (246)	
32930		Alisa Dawn ARMOUR (2)	Theresa DANGLER (242)	Caroline BENNETT (246)	
32931		Alisa Dawn ARMOUR (2)	Theresa DANGLER (242)	Caroline BENNETT (246)	
32932		undervote	undervote	undervote	
32933		Theresa DANGLER (242)	Caroline BENNETT (246)	NP5 Dominic Rosario SAMA (247)	
32934		undervote	undervote	undervote	
32935					

15. **Ballot 7942.** CVR lists one vote for Caroline BENNETT. AuditEngine interpreted that votes were cast for Dominic Rosario SAMA, Rick GARLIPP, and one write-in.



# OFFICIAL MAIL-IN BALLOT

195 Long Branch 6

General Election  
Tuesday, November 8, 2022  
County of Monmouth, New Jersey

Long Branch School District						
Office Title Cargo	Nomination by Petition Nominación por Petición	Nomination by Petition Nominación por Petición	Nomination by Petition Nominación por Petición	Nomination by Petition Nominación por Petición	Nomination by Petition Nominación por Petición	Personal Choice Selección Personal
BOARD OF EDUCATION Vote for Three CONSEJO DE EDUCACIÓN Vote por Tres	Alisa Dawn ARMOUR <input type="radio"/>	Theresa DANGLER <input type="radio"/> <i>Be the Change</i>	David A. BROWN <input type="radio"/>	Avery W. GRANT <input type="radio"/> <i>Education for all</i>	Caroline BENNETT <input type="radio"/>	<i>Donna Ciancone</i> <input checked="" type="radio"/> <i>Write-In - Escríbala</i>
		Rick GARLIPP <input checked="" type="radio"/> <i>Be the Change</i>			Dominic Rosario SAMA <input checked="" type="radio"/>	<input type="radio"/> <i>Write-In - Escríbala</i>
						<input type="radio"/> <i>Write-In - Escríbala</i>

VOTE BOTH SIDES 

V2

Property	Audit	CVR
num_ballots	1	1
overvotes	0	0
tot_votes	3	1
undervotes	0	2
writens	1	0
Alisa Dawn ARMOUR (241)	{'vote': 0, 'PMV': '158', 'IND': 'N'}	{'vote': 0}
Avery W. GRANT (245)	{'vote': 0, 'PMV': '174', 'IND': 'N'}	{'vote': 0}
Caroline BENNETT (246)	{'vote': 0, 'PMV': '177', 'IND': 'N'}	{'vote': 1}
David A. BROWN (244)	{'vote': 0, 'PMV': '169', 'IND': 'N'}	{'vote': 0}
NP5 Dominic Rosario SAMA (247)	{'vote': 1, 'PMV': '434', 'IND': 'D'}	{'vote': 0}
Rick GARLIPP (243)	{'vote': 1, 'PMV': '433', 'IND': 'D'}	{'vote': 0}
Theresa DANGLER (242)	{'vote': 0, 'PMV': '158', 'IND': 'N'}	{'vote': 0}

16. This pattern is roughly consistent throughout the 747 disagreed ballots. The strange thing is that your final aggregated results of this contest from the file "summary.csv" were consistent with the results from AuditEngine and yet differed



from the Cast Vote Records you provided.

17. We have seen similar situations from ES&S where the aggregated results may differ from the Cast Vote Records. However, this normally occurs only when there is an issue with uploading the data from flash memory. In Volusia County, in our audit of the 2020 General Election, we found that the CVR and image data would differ from the aggregated results in two situations: 1) if the system was reset, which cleared the aggregated results but not the CVR nor the ballot images, or 2) if no thumb drive was uploaded but they used the modemed-in aggregated results. We also noticed that in New York, they left some data in memory from the LAT, resulting in a difference in the CVR and the aggregated totals as well.

In these cases, the CVR and the ballot images matched, but they differed from the aggregated totals.

18. Here, however, the aggregated totals match the ballot images but differ from the CVR.

19. The ballots that differ in this contest in this situation are all nonBMD ballots, that apparently were scanned centrally. It is conceivable that this one contest configuration in that central-count scanner was incorrect, resulting in the faulty CVR data. However, we don't understand how the CVR data can be wrong in this way, and yet the aggregated data is still valid.

If you would be so kind, please answer the following questions so we can understand this issue:

1. Were you aware of this inconsistency between the CVR data for this contest and the aggregated result?
2. Can you explain how the aggregated totals were correct, even though the CVR was incorrect?
3. Did you do anything to compensate for the incorrect CVR data, such as re-running these ballots, or performing an additional hand-count?
4. We could not find any statement as to how the repeated ballots were initially detected. Do you have any information about how the thumbdrive double loading was initially detected?

We are continuing to work with local election integrity groups and they may also broach this subject with you. I hope this detailed letter will provide sufficient information.

However, I do have some additional links if you are interested:

Click the link below for the AuditEngine Final Report for Monmouth County, NJ. All other reports can be found from that page:

[https://us-east-1-audit-engine-jobs.s3.amazonaws.com/US/NJ/US\\_NJ\\_Monmouth\\_2022\\_1108/reports/Final\\_Report.html](https://us-east-1-audit-engine-jobs.s3.amazonaws.com/US/NJ/US_NJ_Monmouth_2022_1108/reports/Final_Report.html)

The specific report on the Longbranch BOE contest discussed in this letter is here:

[https://us-east-1-audit-engine-jobs.s3.amazonaws.com/US/NJ/US\\_NJ\\_Monmouth\\_2022\\_1108/reports/Discrepancy\\_Report.html#contest-long-branch-boe-mbe-local-vote-3-s-long-branch-boe-4170](https://us-east-1-audit-engine-jobs.s3.amazonaws.com/US/NJ/US_NJ_Monmouth_2022_1108/reports/Discrepancy_Report.html#contest-long-branch-boe-mbe-local-vote-3-s-long-branch-boe-4170)

We are still working on our final report on these three counties. Regarding the contest "Township of Ocean BOE", you can see the results from AuditEngine at this link:

[https://us-east-1-audit-engine-jobs.s3.amazonaws.com/US/NJ/US\\_NJ\\_Monmouth\\_2022\\_1108/reports/Discrepancy\\_Report.html#contest-township-of-ocean-board-of-education-4281](https://us-east-1-audit-engine-jobs.s3.amazonaws.com/US/NJ/US_NJ_Monmouth_2022_1108/reports/Discrepancy_Report.html#contest-township-of-ocean-board-of-education-4281)

Since we were able to find the 977 repeated ballot images and include them only once, our results are very close (within +/- 3) votes of the hand count you performed.

However, there were 7 disagreed, 3 overvotes, and 30 ballots marked "gray" that we must review. I was holding this letter in hopes of having this resolved, but the developer working on it became ill, and will not have a set of corrections needed so we can get the detailed adjudications from our tool integrated with this report. We will have those results integrated into our report soon. We will provide our final report to you at that time.

Thank you for your kind assistance in this matter. Please feel free to contact me with any questions or comments.

Sincerely,



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