

**DISTRICT OF COLUMBIA
BOARD OF ELECTIONS**

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In Re:)	
)	
Initiative Measure No. 82, the)	Administrative Hearing
“District of Columbia Tip Credit)	No. 22-001
Elimination Act of 2022”)	Certification of Initiative Petition
)	
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MEMORANDUM OPINION AND ORDER

Introduction

On February 22, 2022, Ryan O’Leary (“the Proposer”) timely filed with the Board a petition (“the Petition”) in support of his effort to place Initiative Measure No. 82, the “District of Columbia Tip Credit Elimination Act of 2021” (“the Initiative”) on the ballot. The Petition contained 7966 pages and 33,228 signatures.

After completing its procedures for verifying registered voter signatures contained in the Petition, the Board’s staff, in conjunction with the Data Management Division (“the DMD”) of the Office of Planning, determined that the Initiative meets the statutory requirements for certification to the ballot in accordance with District law. Accordingly, the Board adopts the findings of the Executive Director, Monica Holman Evans (“Executive Director Evans”), as contained in her Petition Verification Report on the Initiative (“the Petition Verification Report”) issued on April 6, 2022 (attached hereto), and incorporates the same into this Order.

Background

On June 22, 2021, the Proposer submitted the Initiative along with supporting information and documents to the Board. On August 26, 2021, the Board held a hearing to determine whether the Initiative met proper subject requirements specified in the law¹, and on August 31, 2021, the

¹ D.C. Official Code § 1-1001.16(b).

Board issued a decision finding that it did. On September 20, 2021, the Board formulated the short title and summary statement for the Initiative with input from interested parties², including counsel for the Restaurant Association of Metropolitan Washington, attorney Andrew J. Kline, Esq.

On October 1, 2021, the formulations for the Initiative were published in the District of Columbia Register for a 10-day challenge period.³ As there were no challenges to the formulations, they were deemed accepted.⁴ On October 13, 2021, the Board issued the Petition to the Proposer, who thereafter commenced the collection of signatures. The Proposer filed the Petition on February 22, 2022, together with all of the signatures collected.

Upon the filing of the Petition, the Board commenced a petition verification process to determine whether or not the number of valid signatures on the Petition met the qualifying percentage and ward distribution requirements necessary for it to achieve ballot access.⁵ Specifically, the Petition was required to contain the signatures of at least five percent of registered voters, including at least five percent of registered voters in each of five or more of the District's eight wards.⁶ The number of registered voters used to determine whether the qualifying percentage and ward distribution requirements have been met with respect to a petition (*i.e.*, the denominator) is the "latest official count" of registered voters issued 30 or more days prior to the submission of the signatures for that petition.⁷ In the case of the Petition, the latest official count was issued on December 31, 2021 ("the December 31, 2021 Report") and published in the District of Columbia Register on January 21, 2022.

² D.C. Official Code § 1-1001.16(c).

³ D.C. Official Code § 1-1001.16(d)(2)(B)(I); 68 D.C. Reg. 10431 (Oct. 1, 2021).

⁴ D.C. Official Code § 1-1001.16(e)(2).

⁵ D.C. Official Code § 1-1001.16(o)(1).

⁶ D.C. Official Code § 1-204.102.

⁷ *Id.*

Based upon the December 31, 2021 Report, the Petition was required to contain the valid signatures of 26,204 registered voters in the District of Columbia. The chart below indicates the minimum number of signatures the Petition was required to contain in particular wards in order for the ward distribution requirement to be satisfied for those wards:

Ward	Required Number of Signatures
1	3241
2	2532
3	2983
4	3247
5	3576
6	4534
7	3089
8	3002
District-wide	26,204

The law provides that the petition verification process be completed within 30 days.⁸ Because the Petition was filed on February 22, 2022, the Board had until March 24, 2022 (thirty days hence) to determine whether the Petition could be certified for ballot access.

For the petition verification process, the Board first verifies the registration of each petition signer and then determines the total number of verified registrants District-wide and by ward. A signature will not be counted toward the required number of signatures if:

- a. The signer's voter registration was designated as inactive on the voter roll at the time the petition was signed;

⁸ D.C. Official Code § 1-1001.16(o)(1).

- b. The signer, according to the Board's records, is not registered to vote at the address listed on the petition at the time the petition was signed except that, if the Board's records indicate that the voter filed a change of address after the date on which the petition was signed but that was received on or before the petition was submitted, the signature shall be included in the random sample universe;
- c. The signature is a duplicate of a valid signature;
- d. The signature is not dated;
- e. The petition does not include the printed or typed address of the signer;
- f. The petition does not include the printed or typed name of the signer where the signature is not sufficiently legible for identification;
- g. The circulator of the petition sheet was not a qualified petition circulator at the time the petition was signed;
- h. The circulator of the petition failed to complete all required information in the circulator's affidavit; or
- i. The signature was obtained on a petition sheet that was submitted on behalf of a previously filed initiative or referendum petition that was rejected or found to be numerically insufficient.

In addition, for purposes of calculating whether the petition contains sufficient signatures District-wide and in each ward, otherwise valid signatures that have an incorrect ward designation are assigned to the correct ward.⁹

In lieu of a signature-by-signature verification process, the statute provides that the "certification may be by a bona fide random and statistical sampling method."¹⁰ The particulars of the random sampling process are set forth in the regulations at 3 DCMR §1009. The total number of verified registrants District-wide and by ward comprise the universe of signatures from which a random sample will be drawn for purposes of verifying the authenticity of the signatures on the petition ("the random sample universe" or "RSU"). If the number of signatures in the RSU does not meet the statutory minimum requirement, the Board shall reject the petition as numerically insufficient. If the number of signatures in the RSU meets or exceeds the statutory minimum requirement, the Board supplies the DMD with the signatures in the random sample universe broken down by ward.

⁹ *Id.*

¹⁰ *Id.*

For the Initiative, the Board initially determined that the number of valid (but not yet verified) signatures District-wide and by ward was as follows:

Ward	Valid Signatures
1	4902 (2370 more than needed for the ward)
2	2782 (250 more than needed for the ward)
3	3688 (705 more than needed for the ward)
4	3699 (452 more than needed for the ward)
5	3269 (307 less than needed for the ward)
6	4656 (122 more than needed for the ward)
7	2257 (832 less than needed for the ward)
8	1682 (1320 less than needed for the ward)
District-wide	26935 (731 more than needed for the District)

This meant that the process stopped for Wards 5, 7, and 8, which did not have a sufficient number of valid signatures (whether verified or not), but had to proceed further for Wards 1, 2, 3, 4, and 6 with respect to signature verification, through the RSU process.

Upon receipt of the valid signatures, in order to verify signature authenticity, the DMD then draws and identifies for the Board a sample of 100 signatures from each ward to be verified. The Board reviews and determines the authenticity of each signature identified by the DMD, and disqualifies each signature that does not match the signature on file in the Board's records.

Once the signature review is completed, the Board reports the number of authentic signatures in each ward sample to the DMD. The DMD then determines whether a ward meets or exceeds the required number of authentic signatures with 95% confidence and should thus be accepted, whether a ward does not equal or exceed the required number of authentic signatures

with 95% confidence and should thus be rejected, or whether a larger sample should be drawn where no decision could be made with 95% confidence from the sample used. This process is set forth in 3 DCMR §1009.¹¹

On March 24, 2022, the Board held a Special Meeting to issue a report on the status of the Petition's verification process. Executive Director Evans reported that the Petition contained 26,935 valid signatures, and was thus able to proceed to the random sample signature verification stage of the verification process. She then reported that, based upon the random sample signature verification process to that point in time, the Petition showed acceptance for Wards 1, 3, and 4 (with 95% confidence), rejection for Wards 5, 7, and 8 (for lack of the requisite valid signatures), and "no decision" for Wards 2 and 6 (for lack of achieving a 95% confidence level one way or the other). In accordance with the Board's regulations, the Board moved to draw additional samples of 100 and 150 signatures for verification for Wards 2 and 6 so that a final 95% confidence determination could be reached with respect to those wards. Accordingly, the Board adjourned the meeting until 3:00 pm when it was expected that the verification process for Wards 2 and 6 would be completed.

When the meeting resumed, Executive Director Evans reported that the signatures for Ward 2 had been verified at a 95% confidence level, but that further sampling and testing of Ward 6 was necessary to reach a 95% conclusive result. She recommended that a sample of 150 additional signatures from Ward 6 be drawn for verification so that a 95% confident acceptance or rejection could be reached for Ward 6. The Board accepted the recommendation, and the meeting was adjourned again until 5:30 pm.

¹¹ 3 DCMR §1009.9 details the process whereby the DMD "shall employ formulas from the fields of probability and statistics" to make one of three determinations, namely, whether a ward does or does not "equals or exceed the required number or authentic signatures with ninety-five percent (95%) confidence," or otherwise "whether a larger sample should be drawn since no decision could be made with ninety-five percent (95%) confidence from the sample used."

Upon reconvening, Executive Director Evans reported that the signatures in Ward 6 still could not be verified to a 95% level of confidence. Based on consultations with the DMD, she advised that further random samples could be pulled and tested until a conclusive result could be reached, but that it was unlikely that the process would be concluded that day, if at all. She also reported that the DMD had recommended that, alternatively, the Board could process all 4656 valid signatures in Ward 6 (in lieu of the random sampling process) to determine if there are enough valid signatures to meet the 95% level of confidence.

While recognizing that the statute requires a decision regarding the Petition's numerical sufficiency within 30 days of its acceptance, the Board noted that its regulations also require that the review process result in a final up or down determination as to whether the Petition should be accepted or rejected. Despite best efforts, that final determination could not be reached within the 30-day timeframe. Faced with the unprecedented likelihood that continued random sampling even of progressively larger sample sizes would, for statistical reasons related to the narrow margin of signatures over the number required for Ward 6, also generate inconclusive results, the Board ordered that the entire universe of valid signatures for Ward 6 be reviewed for signature authentication. Acknowledging the time-consuming nature of this process, the Board emphasized the importance of conducting a complete signature verification review for Ward 6 in order to establish a conclusive final answer for Ward 6 and thus the Initiative as a whole.

After the March 24, 2022 meeting, as a result of a subsequent review of accepted and rejected signatures and resolving and updating a duplicate signature report to ensure that voters were given proper credit in the appropriate ward for signing the petition, the total number of accepted signatures for the District as a whole increased by 91 from 26,935 to 27,026.

Additionally, while authenticating the signatures in Ward 6, the Board's Data Services Division determined that the ward breakdowns needed to be recalculated to reflect the correct ward

breakdown and to ensure that all accepted voter signatures were assigned to the correct ward based on the 2021 ward boundaries. (Amid the Petition circulation period, which began in October 2021 and ended in February 2022, the D.C. Council approved changes to certain ward boundaries (December 29, 2021), and the Board implemented and finalized changes in the voter registry (January 28, 2022)). During this subsequent review, Data Services reassigned voters to the correct ward based on the ward the voters were assigned to *prior* to the Board completing its lists with the new ward boundaries. As a result of this process, adjustments were made to the accepted signature counts District-wide and in Wards 2, 5, 6, 7, and 8.

The chart below indicates the net changes to the accepted signature counts for these wards:

Ward	Accepted Signatures (March 24, 2022 Report)	Accepted Signatures (After Reviewing Accepted and Rejected Signatures/Resolution of Duplicate Report)	Net Change due to Redistricting Recalculations	Total Accepted Signatures (March 31, 2022 Report)
2	2782	3500	-593	2907
5	3269	3276	-11	3265
6	4656	3970	1165	5135
7	2257	2269	-431	1838
8	1682	1693	-130	1563
District-wide	26,935	27,026	0	27,026

A breakdown of adjustments by ward is below:

- Ward 2: Of the 3500 voters who were credited for signing the petition in Ward 2, 651 were residents of Ward 6 and were adjusted into Ward 6 totals. There were 58 Ward 2 residents who were given credit in Ward 6 that were subsequently adjusted into Ward 2. The total adjustment in Ward 2 reduced the accepted signatures by 593 voters.
- Ward 5: Of the 3276 voters who were credited for signing the petition in Ward 5, 11 were residents of Ward 6 and were adjusted into the Ward 6 totals.
- Ward 6: Of the 3970 voters who were credited for signing the petition in Ward 6, 58 were residents of Ward 2 and were adjusted into the Ward 2 totals.
- Ward 7: Of the 2269 voters who were credited for signing the petition in Ward 7, 431 were

residents of Ward 6 and were adjusted into the Ward 6 totals.

- Ward 8: Of the 1693 voters who were credited for signing the petition in Ward 8, 130 were residents of Ward 6 and were adjusted into the Ward 6 totals.

On March 31, 2022, Board staff provided the DMD with the updated figures to determine whether new samples needed to be drawn in light of any of these adjustments. On April 1, 2022, the DMD indicated that it had verified that the random samples of 100 used in the initial statistical calculations were all present in the revised provision of RSU for each ward. Therefore, the DMD concluded, the number of valid signatures in the previous findings was maintained and there was no need to do a new random sample for validation. Also on April 1, 2022, the DMD provided a memorandum to the Board that set forth its statistical summary and findings regarding the Initiative. The memorandum indicated that the Initiative showed acceptance for Wards 1, 2, 3, 4, and 6 with 95% confidence and rejection for Wards 5, 7, and 8. The memorandum also indicated that Wards 1 through 4 were accepted based on random samples of 100 signatures from the RSU for each ward, while Ward 6 was accepted based on the Board's signature-by-signature verification of all valid signatures for that ward in the RSU (with the universe being 100% of all signatures).

On April 6, 2022, at the Board's regular monthly meeting, Executive Director Evans gave the Petition Verification Report, which set forth the DMD's findings as outlined in its April 1, 2022 memorandum. The Petition Verification Report confirms that the Petition contains the valid signatures of 27,026 registered voters District-wide, 2907 registered voters in Ward 2, 3696 registered voters in Ward 3, 3717 registered voters in Ward 4, and 5135 registered voters in Ward 6. These valid and verified signatures meet the required 5% thresholds for the District as a whole and in five of eight wards. Thus, the Initiative is certified to appear on the ballot.

When an initiative has been certified to appear on the ballot, the statute provides that "the Board shall conduct an election on an initiative measure at the next primary, general, or city-wide

special election held at least 90 days after the date on which the measure has been certified as qualified to appear on the ballot.”¹² Here, the Initiative was certified on April 6, 2022. Ninety days hence is July 6, 2022, thus meaning that the Initiative will be placed on the November 8, 2022 General Election ballot.

The reasons for the certification taking place on April 6, 2022, as opposed to March 24, 2022, were justified and reasonable, and were primarily for the purpose of ensuring accuracy in the final determination, which was achieved. While the Board acknowledges the Proposer’s desire for the Initiative to appear on the June 21, 2022 Primary Election ballot, the express terms of the statute and regulations constrain the Board to place the Initiative on the November 8, 2022 General Election ballot.

Conclusion

Based on the findings contained in the Petition Verification Report and the information provided at the meeting on this matter, the Board hereby:

- 1) Certifies that the Petition is numerically sufficient; and accordingly,
- 2) Certifies that the Initiative qualifies for ballot access for the November 8, 2022 General Election.

The Board issues this written order today, which is consistent with its oral ruling rendered on April 6, 2022.

Dated: April 8, 2022



Gary Thompson
Chair, Board of Elections

¹² D.C. Official Code §1-1001.16(p)(1); *see also* 3 DCMR §1010.1.



DISTRICT OF COLUMBIA
BOARD OF ELECTIONS
WASHINGTON, D.C. 20003-4733



April 6, 2022

MEMORANDUM

TO: Board of Elections

FROM: Monica Evans *MTE*
Executive Director

SUBJECT: Petition Verification Report on Initiative Measure No. 82: "District of Columbia Tip Credit Elimination Act of 2021" To Determine whether to Accept the Petition as Numerically Sufficient.

After executing the Board's standard procedure for verifying registered voter signatures contained in the above reference initiative petition, the Board's staff has determined that this petition does meet the statutory requirements for certification to the ballot, in accordance with D.C. Official Code §1-1001.16(o)(1).

It is therefore my recommendation that the Board accept the petition as numerically sufficient, in accordance with D.C. Official Code §1-1001.16(o)(1), because it does contain the signatures of the required minimum number of registered voters. An overview of the petition verification process and a summary of its results are provided below.

Overview of the Petition Verification Process

The petition verification process is conducted to determine whether a petition to present an initiative measure to the electorate contains the minimum number of registered voter signatures required to place the measure on the ballot. The required minimum is 5% of the duly registered voters citywide and 5% of the duly registered voters in at least five of the eight wards. The numerical requirements are based on the Board's published registration totals in effect at least 30 days before the petition was filed, in this case, the voter registration totals as of December 31, 2021.

The petition verification process has several basic steps:

- First, the Board's staff verifies if the circulator is a resident of the District of Columbia or a resident of another jurisdiction who registered as a petition circulator with the Board prior to the circulation of the petition sheet and if the petition has a completed circulator's affidavit.

- Second, the name and address of each petition signer is checked against the voter registration system file to determine if the petitioner was registered to vote at the residence address listed on the petition at the time the petition was signed, as required by law. Only those petition signers whose names and addresses are found to match the Board's registered voter file are entered into the petition checking program as "verified registrants".
- Third, the totals of verified registrants are compiled by the registration system to determine whether the petition contains a sufficient number of registered voters to proceed to the signature verification stage, in which the actual names on the petition are examined against the names on the Board's records.
- Fourth, where the total number of verified registrants is determined to have met the minimum signature requirement, a random sample of signatures is drawn, for comparison to the original voter signatures on file in the Board's records. The validity rate of the randomly selected signatures in the sample is then used to make a statistical determination of the sufficiency of the petition as a whole, at the required confidence level of 95%.
- Fifth, as in this instance, if a statistical determination of the sufficiency of the petition at the required confidence level of 95% cannot be made, based on the random sample, the recommendation of a larger sample is be used to make the determination. Subsequently there is a recommendation to review the entire universe of signatures in a ward where no determination could be made absent such a validation of signatures.

Summary of Findings

The petition for Initiative Measure No.82 "District of Columbia Tip Credit Elimination Act of 2021" containing 7,966 pages was filed on February 22, 2022. The petition contained 33,228 signatures. After completing the procedures for verifying the voter registration status of petition circulators and signers, the total number of eligible signatures counted toward qualifying the initiative for the ballot was initially found to be 26,935. A subsequent review, based on a correction of signatures that were mistakenly rejected for signing twice, found the initiative to actually have 27,026 valid signatures (an increase of 91 signatures). This total exceeded the required 5% minimum of 26,204 registrants citywide by 822 to proceed to the signature sampling stage, the next step in the verification process.

As noted earlier, the random sample procedure is conducted to determine at the required level of confidence whether or not a sufficient number of valid signatures of registered voters are contained in the petition. To help facilitate the sampling procedure, the Office

of Planning's Data Management Division (DMD) randomly selected a sample of 100 petition signatures from each ward. Their initial findings are noted in the attached memorandum dated March 23, 2022.

As a result of the initial random sample, Wards, 1, 3, and 4 were accepted; Wards 5,7 and 8 were rejected and "no decision" could be made regarding Wards 2 and 6. As a result, a subsequent sample was done for Wards 2 and 6. The results of that sampling, consisting of both 100 and 150 signatures concluded to accept Ward 2 but "no decision" could be made for Ward 6. (see attached memorandum dated March 24, 2022). The sampling of 150 voters from Ward 6 similarly resulted in "no decision". (see also attached memo dated March 24, 2002).

Based on the "no decision" determination for Ward 6, the DMD recommended a signature validation by BOE of all registrants in the sampling universe, which, at the time represented 4,656 signers. (see attached email to dated March 24, 2022.) On review of the signatures by BOE, it was determined, that 5,135 Ward 6 registered voters should have actually been assigned to the Ward 6 universe, (479 additional signatures) at the time the petition was signed; prior to the Board's redistricting process. This correction was made to the universe in the ward prior to the sampling of the signatures.

At the conclusion of the petition signature validation of Ward 6 petition signers, it was determined that of the 5,135 registered voters' signatures reviewed, 4,761 were validated. These results were provided to DMD for statistical analysis.

The attached memo dated April 1, 2022 from the Associate Director of DMD details the statistical summary and findings on Initiative No.82 and documents the findings that the initiative is accepted with 95% confidence as having a sufficient number of valid signatures of registered voters. It is the determination from DMD that the initiative shows acceptance in five of the eight wards and rejection of three wards.

Conclusion

Based on the petition verification process, the random sample of signatures, the sampling of the universe of signatures conducted for Ward 6, and the statistical analysis of the sampling of the District as a whole and by ward, it is my recommendation that Initiative Measure No.82: District of Columbia Tip Credit Elimination Act of 2021 is numerically sufficient and should be certified for ballot access by the Board.

cc: Terri D. Stroud, General Counsel



MEMORANDUM

TO: Karen Brooks
Registrar of Voters

FROM: Joy Phillips, PhD. *Joy Phillips*
Associate Director/CIO
Data Analysis and Visualization Unit
DC Office of Planning
1100 4th St. SW., Suite E650
Washington, DC 20024

DATE: March 23, 2022

SUBJECT: Statistical Summary and Findings on Initiative #82

Following is a statistical summary resulting from the random sample verification of signatures on Initiative #82 - District of Columbia Tip Credit Elimination Act of 2021. Our finding is that at the District-wide level the initiative is accepted with 95% confidence as having a sufficient number of valid signatures of registered voters. However, the initiative shows acceptance for three (3) of the eight (8) wards, with no decision on two (2) wards and rejection on three (3) wards.

Table 1 shows the required number of valid signatures and the number of registrant signatures by ward and the District as a whole that were subject to random sampling. As shown in Tables 2 and 3, three (3) of the wards and the District as a whole were accepted with 95% confidence. Wards 2 and 6 resulted in no decision. Wards 5, 7, and 8 were rejected at the outset because the number of verified registrants was less than the required number. Nevertheless, these Wards were sampled so that they contributed with the other wards to the District-wide figure.



Attachments:

Table 1		
Ward	Signatures of Registered Voters Required	Total Signatures to be Utilized for Random Sampling
1	3,241	4,902
2	2,532	2,782
3	2,983	3,688
4	3,247	3,699
5	3,576	3,269
6	4,534	4,656
7	3,089	2,257
8	3,002	1,682
District-wide	26,204	26,935

Table 2				
Ward	Acceptance/Rejection Parameters		Number of Valid Signatures in Sample of 100	Decision with 95% Confidence
	a1	b1		
1	57	75	93	Accept
2	85	96	94	No decision
3	73	88	97	Accept
4	81	94	95	Accept
5	-	-	94	Reject
6	94	100	96	No decision
7	-	-	97	Reject
8	-	-	96	Reject

Table 3 - District as a whole	
Z (R) =	5.29
Z (R-1) =	5.29
Decision with 95% Confidence:	
	Accept



MEMORANDUM

TO: Karen Brooks
Registrar of Voters

FROM: Joy Phillips, PhD. *Joy Phillips*
Associate Director/CIO
Data Analysis and Visualization Unit
DC Office of Planning
1100 4th St. SW., Suite E650
Washington, DC 20024

DATE: March 24, 2022

SUBJECT: Statistical Summary and Findings on Initiative #82

Following is a statistical summary resulting from the second random sample of 100 for Wards 2 and 6 (the first sample from the other 6 Wards remained the same) to verify signatures on Initiative #82 - District of Columbia Tip Credit Elimination Act of 2021. Our finding is that at the District-wide level the initiative is accepted with 95% confidence as having a sufficient number of valid signatures of registered voters. However, the initiative shows acceptance for four (4) of the eight (8) wards, with no decision on one (1) ward and rejection on three (3) wards.

Table 1 shows the required number of valid signatures and the number of registrant signatures by ward and the District as a whole that were subject to random sampling. As shown in Tables 2 and 3, four (4) of the wards and the District as a whole were accepted with 95% confidence. Ward 6 resulted in no decision. Wards 5, 7, and 8 were rejected at the outset because the number of verified registrants was less than the required number. Nevertheless, these Wards were sampled so that they contributed with the other wards to the District-wide figure.



Attachments:

Table 1		
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6	4,534	4,656
7	3,089	2,257
8	3,002	1,682
District-wide	26,204	26,935

Table 2 - Second Sample of 100 for Wards 2 and 6				
Ward	Acceptance/Rejection Parameters		Number of Valid Signatures in Sample of 100	Decision with 95% Confidence
	a1	b1		
1	57	75	93	Accept
2	85	96	98	Accept
3	73	88	97	Accept
4	81	94	95	Accept
5	-	-	94	Reject
6	94	100	97	No decision
7	-	-	97	Reject
8	-	-	96	Reject

Table 3 - District as a whole (Second 100 Sample)	
Z (R) =	5.43
Z (R-1) =	5.43
Decision with 95% Confidence:	Accept



MEMORANDUM

TO: Karen Brooks
Registrar of Voters

FROM: Joy Phillips, PhD. *Joy Phillips*
Associate Director/CIO
Data Analysis and Visualization Unit
DC Office of Planning
1100 4th St. SW., Suite E650
Washington, DC 20024

DATE: March 24, 2022

SUBJECT: Statistical Summary and Findings on Initiative #82

Following is a statistical summary resulting from the second random sample of 150 for Wards 2 and 6 (the first sample from the other 6 wards remained the same) to verify signatures on Initiative #82 - District of Columbia Tip Credit Elimination Act of 2021. Our finding is that at the District-wide level the initiative is accepted with 95% confidence as having a sufficient number of valid signatures of registered voters. However, the initiative shows acceptance for four (4) of the eight (8) wards, with no decision on one (1) ward and rejection on three (3) wards.

Table 1 shows the required number of valid signatures and the number of registrant signatures by ward and the District as a whole that were subject to random sampling. As shown in Tables 2 and 3, four (4) of the wards and the District as a whole were accepted with 95% confidence. Ward 6 resulted in no decision. Wards 5, 7, and 8 were rejected at the outset because the number of verified registrants was less than the required number. Nevertheless, these Wards were sampled so that they contributed with the other wards to the District-wide figure.

Attachments:

Table 1		
Ward	Signatures of Registered Voters Required	Total Signatures to be Utilized for Random Sampling
1	3,241	4,902
2	2,532	2,782
3	2,983	3,688
4	3,247	3,699
5	3,576	3,269
6	4,534	4,656
7	3,089	2,257
8	3,002	1,682
District-wide	26,204	26,935

Table 2 - Second Sample of 150 for Wards 2 and 6				
Ward	Acceptance/Rejection Parameters		Number of Valid Signatures in Sample	Decision with 95% Confidence
	a1	b1		
1	57	75	93	Accept
2	129	143	146	Accept
3	73	88	97	Accept
4	81	94	95	Accept
5	-	-	94	Reject
6	142	149	146	No decision
7	-	-	97	Reject
8	-	-	96	Reject

Table 3 - District as a whole (150 Sample)	
Z (R) =	5.25
Z (R-1) =	5.26
Decision with 95% Confidence:	Accept

Monica Evans

From: Phillips, Joy (OP) <joy.phillips@dc.gov>
Sent: Thursday, March 24, 2022 7:30 PM
To: Monica Evans; Karen Brooks
Subject: Exhausting Population/Universe of Signatures
Attachments: Criteria for Acceptance or Rejection of Petitions.doc

Hi Ms. Evans & Ms. Brooks: Based on the attached criteria (last paragraph in section 1), I am advocating for exhausting the population/universe of signatures for ward 6 to determine if there are enough valid signatures to meet the requirement. Thus, if 4,534 signatures of the universe of 4,656 for ward 6 are valid, then ward 6 will meet the requirement. My suggestion is for BOE to process all 4,656 signatures to determine how many are valid.

Joy Phillips, PhD.

Cell: 301-633-8468

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Criteria for Acceptance or Rejection of Petitions with 95% Confidence

I. Criteria for Wards

The procedure described in this section is applied to each ward of the District. Accordingly, all quantities refer to a specific ward, not to the District as a whole.

- Notation

R = required number of valid signatures.

N = number of apparent signatures of verified registered voters. This is the population size.

k = number of valid signatures in population.

n_i = size of i -th sample ($i=1,2$).

x_i = number of valid signatures found in i -th sample.

a_i = number of valid signatures in i -th sample below which petition is rejected.

b_i = number of valid signatures in i -th sample above which petition is accepted.

- Determination of a_1 and b_1

The statistic x_1 has the hypergeometric distribution $H(N,k,n_1,x_1)$.

a_1 is the largest integer such that $P(x_1 < a_1) = \sum_{x_1=0}^{a_1-1} H(N,R,n_1,x_1) \leq .025$.

b_1 is the smallest integer such that $P(x_1 > b_1) = \sum_{x_1=b_1+1} H(N,R-1,n_1,x_1) \leq .025$.

- Rule for Acceptance, Rejection, or No Decision on First Sample

If $x_1 < a_1$, reject the ward.

If $x_1 > b_1$, accept the ward.

If $a_1 \leq x_1 \leq b_1$, then no decision is reached on the first sample, and a second sample must be drawn.

- Determination of a_2 and b_2 if Second Sample is Required

If required, a second sample is drawn from the $N-n_1$ signatures not previously sampled. The required number of valid signatures for this reduced population is $R-x_1$. For the second sample the statistic x_2 has the distribution $H(N-n_1, k-x_1, n_2, x_2)$.

a_2 is the largest integer such that $P(x_2 < a_2) = \sum_{x_2=0}^{a_2-1} H(N-n_1, R-x_1, n_2, x_2) \leq .025$.

b_2 is the smallest integer such that $P(x_2 > b_2) = \sum_{x_2=b_2+1}^{n_2} H(N-n_1, R-x_1-1, n_2, x_2) \leq .025$.

- Rule for Acceptance, Rejection, or No Decision on Second Sample

If $x_2 < a_2$, reject the ward.

If $x_2 > b_2$, accept the ward.

If $a_2 \leq x_2 \leq b_2$, then no decision is reached on the second sample. In such a case the remaining population of signatures would be inspected until either the required number of valid signatures is reached or the population is exhausted.

II. Criteria for Entire District

- Notation

R = required number of valid signatures for entire District.

K = number of valid signatures in population for entire District.

N_h = number of apparent signatures of verified registered voters in Ward h ($h = 1, 2, \dots, 8$).

n_{hi} = size of i -th Ward h sample ($i=1, 2$).

x_{hi} = number of valid signatures found in i -th Ward h sample.

$p_{hi} = x_{hi} / n_{hi}$ = proportion of signatures in i -th Ward h sample that are valid.

- Construction of a Test Statistic

$$z = \frac{\sum_{h=1}^8 N_h p_{h1} - K}{\sqrt{\sum_{h=1}^8 N_h (N_h - n_{h1}) p_{h1} (1 - p_{h1}) / (n_{h1} - 1)}}$$

Then $P(z < -1.96) = .025$ and $P(z > 1.96) = .025$

- Rule for Acceptance, Rejection, or No Decision

$$\text{If } z = \frac{\sum_{h=1}^8 N_h p_{h1} - R}{\sqrt{\sum_{h=1}^8 N_h (N_h - n_{h1}) p_{h1} (1 - p_{h1}) / (n_{h1} - 1)}} < -1.96,$$

reject the petition for the District.

$$\text{If } z = \frac{\sum_{h=1}^8 N_h p_{h1} - (R-1)}{\sqrt{\sum_{h=1}^8 N_h (N_h - n_{h1}) p_{h1} (1 - p_{h1}) / (n_{h1} - 1)}} > 1.96,$$

accept the petition for the District.

If neither of the above conditions holds, no decision is made on the first sample, and a second sample must be drawn. For a second sample, the quantities

$$N_h, n_{h1}, p_{h1}, \text{ and } R \text{ would be replaced by } N_h - n_{h1}, n_{h2}, p_{h2}, \text{ and } R - \sum_{h=1}^8 x_{h1}$$

respectively. If no decision is reached on a second sample, the remaining population of signatures would be inspected until either the required number of valid signatures is reached or the population is exhausted.

III. Probability of a Correct Decision

Let the events A_i and B_i ($i=1,2,3$) be defined as follows:

A_i = acceptance on i -th sample.

B_i = no decision on i -th sample.

Assume the petition does not contain the required number of valid signatures.

Then $P(\text{error in decision}) = P(\text{acceptance}) =$

$$P(A_1) + P(B_1 \text{ AND } A_2) + P(B_1 \text{ AND } B_2 \text{ AND } A_3) = P(A_1) + P(B_1) P(A_2 | B_1) + 0$$

Note: $P(B_1 \text{ AND } B_2 \text{ AND } A_3) = 0$ since A_3 , acceptance after examining all signatures, cannot occur.

From sections I and II, $P(A_1) \leq .025$, $P(A_2 | B_1) \leq .025$.

Thus $P(\text{error in decision}) \leq .025 + (1)(.025) = .05$, and $P(\text{correct decision}) = 1 - P(\text{error in decision}) \geq .95$.

Under the assumption that the petition does not contain the required number of signatures, the probability of a correct decision, i.e. rejection, is at least .95. By the same reasoning we could show that a petition with the required number of signatures would have a .95 or greater probability of acceptance. Thus whether or not the petition contains the required number of signatures, the probability of arriving at a correct decision is at least .95.



MEMORANDUM

TO: Karen Brooks
Registrar of Voters

FROM: Joy Phillips, PhD. *Joy Phillips*
Associate Director/CIO
Data Analysis and Visualization Unit
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DATE: April 1, 2022

SUBJECT: Statistical Summary and Findings on Initiative #82

Following is a statistical summary resulting from the random sample verification of signatures on Initiative #82 - District of Columbia Tip Credit Elimination Act of 2021. Our finding is that at the District-wide level the initiative is accepted with 95% confidence as having a sufficient number of valid signatures of registered voters. The initiative shows acceptance for five (5) of the eight (8) wards and rejection on three (3) wards. Of the five wards accepted, four wards were accepted based on a random sample of 100 signatures from the sampling universe, while the fifth ward (ward 6) was accepted based on the signature validation by BOE of all registrants in the sampling universe (see note below). *Note: At the conclusion of the petition validation of Ward 6 petition signers, it was determined that of the 5,135 registered voters' signatures reviewed, we validated 4,761.*

Table 1 shows the required number of valid signatures and the number of registrant signatures by ward and the District as a whole that were subject to random sampling. As shown in Tables 2 and 3, five (5) of the wards and the District as a whole were accepted with 95% confidence. Wards 5, 7, and 8 were rejected at the outset because the number of verified registrants was less than the required number. Nevertheless, these Wards were sampled so that they contributed with the other wards to the District-wide figure.



Attachments:

Table 1		
Ward	Signatures of Registered Voters Required	Total Signatures to be Utilized for Random Sampling
1	3,241	4,905
2	2,532	2,907
3	2,983	3,696
4	3,247	3,717
5	3,576	3,265
6	4,534	5,135
7	3,089	1,838
8	3,002	1,563
District-wide	26,204	27,026

Table 2				
Ward	Acceptance/Rejection Parameters		Number of Valid Signatures in Sample of 100	Decision with 95% Confidence
	a1	b1		
1	57	75	93	Accept
2	80	93	94	Accept
3	73	88	97	Accept
4	81	93	95	Accept
5	-	-	94	Reject
6	82	94	See note below	Accept*
7	-	-	97	Reject
8	-	-	96	Reject

Note: * At the conclusion of the petition validation of Ward 6 petition signers, it was determined that of the 5,135 registered voters' signatures reviewed, we validated 4,761.

Table 3 - District as a whole	
Z (R) =	5.57
Z (R-1) =	5.57
Decision with 95% Confidence:	
	Accept