

IN THE UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF ARKANSAS
CENTRAL DIVISION

THE CHRISTIAN MINISTERIAL ALLIANCE, et al.

Plaintiffs,

vs.

Case No. :23-CV-471-DPM

JOHN THURSTON, in his official capacity as Secretary
of State of Arkansas, et al.,

Defendants.

DEPOSITION OF

DR. BAODONG LIU

TAKEN ON

SEPTEMBER 25, 2024

9:55 A.M.

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PENGAD-Beyonne, M. J.

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<p>1 DEPOSITION OF Page 7</p> <p>2 DR. BAODONG LIU</p> <p>3 TAKEN ON</p> <p>4 SEPTEMBER 25, 2024</p> <p>5 9:55 A.M.</p> <p>6</p> <p>7 DR. BAODONG LIU called as a witness herein, having</p> <p>8 been first duly sworn by the Certified Court</p> <p>9 Reporter to tell the truth, was examined and</p> <p>10 testified as follows:</p> <p>11 EXAMINATION</p> <p>12 BY MR. BRASCHER:</p> <p>13 Q. Dr. Liu, thank you very much for being</p> <p>14 here. My name is Justin Brascher. I'm with the</p> <p>15 Arkansas Office of the Attorney General. I'm here</p> <p>16 to take your deposition today.</p> <p>17 Could you please state your whole name and</p> <p>18 spell your last?</p> <p>19 A. My whole name is Baodong Liu. Last name,</p> <p>20 L-I-U.</p> <p>21 Q. Thank you very much. And, again,</p> <p>22 appreciate you being here. I do have to say I</p> <p>23 really like Salt Lake City. Really nice city.</p> <p>24 A. It's a great view.</p> <p>25 Q. So you -- have you been deposed before?</p>	<p>1 Q. Wonderful. The only other thing I say is</p> <p>2 -- and you have counsel here -- if I ask a question</p> <p>3 and you don't understand it, which could very well</p> <p>4 happen, then you tell me, "Hey, I don't understand</p> <p>5 the question," or you ask me to clarify. If you</p> <p>6 give me an answer, then I'm going to assume you</p> <p>7 understood what I asked. Is that fair?</p> <p>8 A. Yes.</p> <p>9 Q. Wonderful. And, of course, you know, if</p> <p>10 your counsel has an objection, they're going to make</p> <p>11 the objection. Unless they tell you not to answer,</p> <p>12 then I'll ask for you to answer the question. Is</p> <p>13 that fair?</p> <p>14 A. Yes.</p> <p>15 Q. Okay. All right. Let's start with I have</p> <p>16 -- we've premarked it as Exhibit 1 -- this is just</p> <p>17 your notice of deposition. If you could take a look</p> <p>18 at that.</p> <p>19 (Exhibit 1 marked.)</p> <p>20 Q. (BY MR. BRASCHER) Have you -- have you</p> <p>21 seen that previously?</p> <p>22 A. If I remember correctly, this -- the last</p> <p>23 item here, Schedule A, was submitted yesterday. So,</p> <p>24 yes. Yes, I did.</p> <p>25 Q. Okay. Thank you very much. And I</p>

<p style="text-align: right;">Page 10</p> <p>1 appreciate -- I understand it was a very quick turn 2 around on that. We're all -- we're on a very 3 compressed timeline, as I'm sure your counsel is 4 aware of as well. So I appreciate that. 5 Is there anything in that notice of 6 deposition that I just handed you that seems out of 7 the ordinary or that is unfamiliar to you? 8 A. Well, yesterday, once I received this 9 Schedule A, I talked to my -- the counsel for the 10 plaintiffs, and I -- 11 MS. PAVEL: I would instruct the witness 12 not divulge the contents of any of our 13 conversations. 14 THE WITNESS: Right. Right. 15 MR. BRASCHER: And I'm not trying to get 16 into -- 17 MS. PAVEL: Understood. 18 THE WITNESS: Right. So we did have 19 response. That's what I'm getting at. 20 Q. (BY MR. BRASCHER) Yes. And I received 21 responses. Yes. Yes. Thank you. 22 Okay. So let's start with outside of 23 specific -- the details of specific conversations 24 with your counsel. What did you do to prepare for 25 today's deposition?</p>	<p style="text-align: right;">Page 12</p> <p>1 this case? 2 A. LDF. 3 Q. LDF. And are you being paid by LDF? 4 A. Yes. 5 Q. And how much are you being paid by LDF? 6 A. It's in my -- \$300 per hour. 7 Q. Okay. And I will say I'm going to ask you 8 probably quite a few questions today that are 9 probably in your report that you've said before. 10 I'm probably going to ask you those questions, 11 because then my intention is to try to understand it 12 further. So don't be offended that -- I have read 13 everything you've done. It's not like I'm just 14 asking questions off the top. I'm just looking to 15 start from there and then go deeper if that's okay. 16 A. Sure. 17 Q. Okay. So you said you've been deposed 18 seven or eight times; is that right? 19 A. Yes. 20 Q. Okay. What cases, if you can remember, 21 were you deposed in? 22 A. Those cases are voting rights cases and 23 especially Section 2 of VRA. So the cases are 24 mainly for me to serve as expert witness to provide 25 evidence or lack of racially polarized voting.</p>
<p style="text-align: right;">Page 11</p> <p>1 A. I prepared for today's deposition based on 2 reviewing documents including my own report and my 3 rebuttal report and reviewing Mr. Bryan's report 4 and just went over the data that I used, make sure 5 that everything is in order. 6 Q. Okay. 7 A. So, yeah. Basically, that's it. 8 Q. Can I get a little more specific, then? 9 What -- what data did you review? 10 A. Yeah. I provided a list of data, my R 11 code that run the data, and results of my 12 statistical operations on the data. So these are 13 the things I reviewed. 14 Q. Okay. So you reviewed the data, you 15 reviewed your statistical models, you said? Is that 16 -- am I understanding that correctly? 17 A. I reviewed everything in the production 18 that I submit -- submitted. 19 Q. Sure. Understood. Okay. 20 Okay. So you reviewed everything in that 21 production. Is there anything else that you 22 reviewed or did to prepare for this deposition? 23 A. I don't remember anything else. That's 24 it. 25 Q. Who has retained you for the purposes of</p>	<p style="text-align: right;">Page 13</p> <p>1 Yeah. Those are mainly the cases. 2 Q. Have you ever been deposed in a non- 3 Section 2 Voting Rights Act case? 4 A. Yes. 5 Q. What case was that? Or cases? Do you 6 remember? 7 A. Yeah. I remembered that in a South 8 Carolina case, it was different from Section 2, the 9 Alexander decision for that case. That's not about 10 Section 2. And I also served in another case 11 related to Jefferson County in Alabama. And that's 12 not Section 2. It's also a racial gerrymandering 13 case. 14 Q. What is your understanding of the 15 difference between those two cases as it applies to 16 the sort of analysis that you do? 17 MS. PAVEL: Objection to form. 18 THE WITNESS: I'm not a lawyer, but I do 19 understand the role I play. Usually given whatever 20 assignment from the counsel for the plaintiffs for 21 Section 2, mainly as an expert on quantitative 22 analysis, I was responsible for empirically testing 23 whether or not there was a pattern of racially 24 polarized voting. And for a racial gerrymandering 25 case, that is not the role I play. Empirically, I</p>

<p style="text-align: right;">Page 14</p> <p>1 -- I was asked, for a racial gerrymandering case, to 2 provide empirical evidence or lack of for 3 disentangling the role of race vis-a-vis of the role 4 of party in a given enacted plan for redistricting. 5 So these are the main differences as far as my roles 6 are concerned. 7 Q. (BY MR. BRASCHER) Makes sense. Okay. So 8 in the cases that you have been retained that are 9 either Voting Rights Act cases or racial 10 gerrymandering cases, how often would you say your 11 opinion is that -- that either the Voting Rights Act 12 was violated or that race was a factor in the map 13 making? 14 MS. PAVEL: Objection to form. 15 Q. (BY MR. BRASCHER) Do you understand the 16 question? 17 A. I need your explanation further, because 18 -- 19 Q. Let me break this up. I tried to ask two 20 different questions at once. In the Section 2 21 Voting Rights Act cases that you've been retained 22 in, how often is your -- is it your opinion that the 23 Section 2 of the Voting Rights Act has been 24 violated? 25 A. If you are asking me about all the cases I</p>	<p style="text-align: right;">Page 16</p> <p>1 Q. Okay. More than half? 2 A. Yeah. More than half. 3 Q. But not every time? 4 A. Not every time, for every office. 5 Q. Okay. And you said that sometimes counsel 6 will get in touch with you prior to a lawsuit -- 7 A. Yes. 8 Q. -- actually being filed to get your 9 opinion on whether there's racially polarized 10 voting? 11 A. Yes. Sometimes I was asked to analyze 12 data before the counsel made decision one way or 13 another. I just used my knowledge and skill to 14 analyze the data for them and reported to them my 15 results, and then they make decisions. Sometimes 16 they -- there is -- there is a decision of not 17 launching a lawsuit. 18 Q. And how -- based on the number of times 19 that you look at a situation to determine whether 20 there's racially polarized voting, how many times do 21 you find that it's not racially polarized? Can you 22 think of -- is it less than half? Is it less than 25 23 percent? Do you -- 24 A. Could you explain further exactly what 25 scenario?</p>
<p style="text-align: right;">Page 15</p> <p>1 did deposition, the answer is usually I do find 2 racially polarized voting. But that doesn't mean 3 all the electoral offices that I analyzed revealed 4 elections that are racially polarized. Some of them 5 may not. But usually, there's a pattern. But as an 6 expert, I've been asked to analyze data before 7 deposition. Sometimes I failed to find pattern of 8 racially polarized voting. Then I report it to the 9 counsel who decided whether or not they would 10 eventually launch lawsuit. 11 So -- I believe I answered that part of 12 the question that you asked. Did you ask also about 13 the racial -- 14 Q. I'll get there. No. I'm sorry. I did 15 not mean to cut you off. 16 A. Yeah. Sorry. 17 Q. Okay. So then, you said -- you used the 18 word "usually." 19 A. Mm-hmm. 20 Q. So would that mean 75 percent of the time, 21 you find racially polarized and 25 percent, you 22 don't? Or what sort of ratio are we talking about 23 with "usually"? 24 A. Yeah. "Usually," by that I mean majority 25 of time. I don't know whether it's 75 exactly.</p>	<p style="text-align: right;">Page 17</p> <p>1 Q. Lawsuit has not been filed yet. 2 A. Yeah. 3 Q. They reach out to get your opinion on 4 whether there is racially polarized voting or not. 5 How often would you say you find that there is 6 racially polarized voting, and how often would you 7 say that there isn't? 8 A. I've done a lot of analysis for elections. 9 I cannot give you a fixed number obviously. Just 10 top of -- in two decades -- more than two decades I 11 served as expert witness -- again, I cannot give you 12 an exact number, but I would say also there tend to 13 be patterns of racially polarized voting, especially 14 in southern states that I served as expert. But, 15 again, I cannot have a specific number for you just 16 off the top of my head. 17 Q. Okay. That's fine. Let's try in ballpark 18 maybe. More than half? 19 A. Yeah. I would say more than half. 20 Q. Okay. More than three-quarters? 21 A. That is too specific. I don't know. I'd 22 have to go back and check. 23 Q. Okay. That's fine. I appreciate that. 24 You said in that answer, specifically as 25 it comes to the southern -- the southern states.</p>

<p style="text-align: right;">Page 18</p> <p>1 A. Yes.</p> <p>2 Q. Would you consider Arkansas to be a</p> <p>3 southern state?</p> <p>4 A. Yes.</p> <p>5 Q. And does that -- is that a lens through</p> <p>6 which you view your analysis when you're making it,</p> <p>7 the fact that you're analyzing a southern state?</p> <p>8 Does that have any impact on your analysis?</p> <p>9 MS. PAVEL: Objection to form.</p> <p>10 THE WITNESS: No. That's not.</p> <p>11 Q. (BY MR. BRASCHER) Okay. Okay. So how</p> <p>12 many cases have you been deposed in that have been</p> <p>13 specifically racial gerrymandering ones? You talked</p> <p>14 about the South Carolina case. Are there others?</p> <p>15 A. Yeah. I think -- it's in my list. Two of</p> <p>16 them in addition to this one.</p> <p>17 Q. Okay. And what were your opinions in</p> <p>18 those cases?</p> <p>19 MS. PAVEL: Objection to form.</p> <p>20 THE WITNESS: I have to go back, obviously,</p> <p>21 to read exactly my opinion, but I used -- I believe</p> <p>22 my memory says that I used specific empirical data</p> <p>23 and best available method to try to distinguish the</p> <p>24 role of race versus the role of party. And in South</p> <p>25 Carolina, race, as I discovered, played a greater</p>	<p style="text-align: right;">Page 20</p> <p>1 defendants in a Voting Rights Act or racial</p> <p>2 gerrymandering case? And I don't mean the specific</p> <p>3 -- the State of Arkansas. I mean the people that</p> <p>4 were the defendants in the particular case.</p> <p>5 MS. PAVEL: Objection to form.</p> <p>6 THE WITNESS: Could you repeat the</p> <p>7 question?</p> <p>8 Q. (BY MR. BRASCHER) Sure. Today you are</p> <p>9 here working for the plaintiffs.</p> <p>10 A. Right. For counsel for plaintiffs, yes.</p> <p>11 Q. Yes. As an expert on their behalf. Have</p> <p>12 you ever been an expert for the defendants in a</p> <p>13 Voting Rights Act case or racial gerrymandering</p> <p>14 case?</p> <p>15 A. Yes.</p> <p>16 Q. Okay. And what cases were those?</p> <p>17 A. It was a case in Florida concerning,</p> <p>18 again, redistricting, but it was a Section 2 case.</p> <p>19 The plaintiffs were League of Women Voters. I was</p> <p>20 retained by the state legislature as defendants'</p> <p>21 counsel to provide my professional opinion on</p> <p>22 whether or not there was racially polarized voting.</p> <p>23 Q. And in that particular case, was it your</p> <p>24 opinion that there was racially polarized voting or</p> <p>25 there was not?</p>
<p style="text-align: right;">Page 19</p> <p>1 role than partisan affiliation. So that's what I</p> <p>2 remember. I don't have the exact report in front of</p> <p>3 me, so I have to go back and check exactly what I</p> <p>4 said.</p> <p>5 Q. (BY MR. BRASCHER) That's -- that's okay.</p> <p>6 And that's too broad a question I asked. I guess</p> <p>7 what I was asking was simply, in the other racial</p> <p>8 gerrymandering cases that you've been deposed in,</p> <p>9 was it your opinion that racial gerrymandering had</p> <p>10 occurred in those cases?</p> <p>11 MS. PAVEL: Objection to form.</p> <p>12 THE WITNESS: I am not a lawyer, so if</p> <p>13 you're asking me racial gerrymandering, meaning in</p> <p>14 legal term, I am not a lawyer, so I don't provide</p> <p>15 opinion on whether legally that's established or</p> <p>16 not. But I provided empirical evidence to</p> <p>17 distinguish race from party on which legal</p> <p>18 determination can be made, but that's not my</p> <p>19 assignment.</p> <p>20 Q. (BY MR. BRASCHER) Understood. Let me ask</p> <p>21 the question differently. Was it your opinion in</p> <p>22 those cases that race had been a factor in the way</p> <p>23 that the maps were drawn?</p> <p>24 A. Yes.</p> <p>25 Q. Okay. Have you ever represented the</p>	<p style="text-align: right;">Page 21</p> <p>1 A. I don't remember the details. It was</p> <p>2 probably ten years ago. But I -- I serve as expert</p> <p>3 for defendants.</p> <p>4 Q. Is that the only time that you've served</p> <p>5 as an expert for the defendants?</p> <p>6 A. Yes.</p> <p>7 Q. Okay. So the -- if we can move kind of to</p> <p>8 your report. The data that you rely on in your</p> <p>9 report, where did you get that data from?</p> <p>10 A. Yes. I explained in detail the sources of</p> <p>11 data and where I got them. So I analyzed three</p> <p>12 elections. The 2018 gubernatorial primaries data, I</p> <p>13 received from the counsel. And I simply merged that</p> <p>14 election data with the census demographic data</p> <p>15 myself. But for the other two elections, meaning</p> <p>16 the 2022 gubernatorial primaries and the 2020</p> <p>17 presidential election, I received the merged data</p> <p>18 already by the Redistricting Hub. So I didn't merge</p> <p>19 them, but they were ready for me. And so, I simply</p> <p>20 analyzed.</p> <p>21 Q. When you say "merged," can you tell me</p> <p>22 what you mean by that?</p> <p>23 A. Oh, yeah. Sure. "Merging" is a simple</p> <p>24 procedure to combine different sources of data. In</p> <p>25 this case, we have two sources of data. One source</p>

<p style="text-align: right;">Page 22</p> <p>1 is about the election outcome. And that data is in 2 the public domain, published by the Secretary of 3 State office. In this case, obviously Arkansas. 4 And then, there's another source of data that's the 5 demographics in Arkansas. So these two sources of 6 data, one's political. The other is simply 7 demographic by census. They need to be combined 8 together.</p> <p>9 Q. And when you say "combined together," is 10 the idea so that you can figure out specific what 11 areas are voting for whom? Is that one of the ideas?</p> <p>12 A. The main reason for that is that the 13 method we use to test the notion whether race or 14 party matter has to be -- has to be put in a 15 software program that can run on the variables of 16 interest. In this case, the election variable and 17 demographic variable. They have to be available 18 simultaneously in the software program on which we 19 run.</p> <p>20 So in order to run the software program to 21 get results, we have to have those data 22 simultaneously.</p> <p>23 Q. Okay. So you said you got some data from 24 counsel. And by "counsel," I assume you mean LDF?</p> <p>25 A. Yes.</p>	<p style="text-align: right;">Page 24</p> <p>1 organization, but to my knowledge, they have been in 2 the field for a while. So I assume. Again, I'm not 3 from that organization, so they have -- I assume 4 they have done a lot of professional services. But 5 I don't know the nature of the organization 6 whatsoever.</p> <p>7 Q. Okay. This would probably be a good time 8 -- let's -- can you walk me through sort of your 9 educational background?</p> <p>10 A. Sure. I was educated originally in China 11 before I came to America to pursue my graduate 12 degree. I went to undergraduate law school, which 13 is the Chinese system, and got my bachelor in law 14 there. And then, I came to America to pursue a 15 graduate degree first in a master program at 16 Oklahoma State University in political science and 17 finished my degree in 1995. And then, I moved to a 18 PhD program in New Orleans at the University of New 19 Orleans, also in political science, and finished 20 that degree in 1999.</p> <p>21 Q. And what has been your professional career 22 path since that graduation in 1999?</p> <p>23 MS. PAVEL: Objection to form.</p> <p>24 THE WITNESS: Could you explain "career 25 path" --</p>
<p style="text-align: right;">Page 23</p> <p>1 Q. And then you said you got some data from 2 Redistricting Hub?</p> <p>3 A. Yes.</p> <p>4 Q. Could you explain to me what Redistricting 5 Hub is?</p> <p>6 A. I'm not the person associated with the 7 hub. I believe it's a professional organization 8 that has provided a lot of first rate services to 9 their clients on issues related to Section 2 claim 10 or gerrymandering claim. They used, again, two 11 sources of data, demographics and election results. 12 They have their procedures about how to 13 merge these two sources of data. And for my report, 14 they did provide me the read me files about their 15 procedures, which I attached into my report for the 16 Court to see.</p> <p>17 Q. And Redistricting Hub, is that a -- I 18 assume -- is it a website?</p> <p>19 A. There is a website. I did provide the 20 website address, yes.</p> <p>21 Q. Yes. Yes. And I saw that. And is that a 22 website or, larger, an organization that is used by 23 other people other than you in your field or line of 24 work?</p> <p>25 A. I'm not the spokesperson for the</p>	<p style="text-align: right;">Page 25</p> <p>1 Q. (BY MR. BRASCHER) Sorry. What jobs have 2 you held since that graduation in 1999?</p> <p>3 A. Yes. Ever since I graduated in 1999, I 4 have been in professional research and teaching 5 positions at a higher ed institution, first in 6 Missouri, then in Wisconsin, now in Utah, all in 7 higher ed.</p> <p>8 Q. And what were the nature -- what was the 9 nature of those teaching positions? What were you 10 teaching?</p> <p>11 A. Yes. I, as a professor, teach political 12 science courses, and my sub field is American 13 politics. So mainly, I teach both graduate and 14 undergraduate programs on, say, voting behavior, 15 American government, and urban politics, elections, 16 and so on and so forth.</p> <p>17 Q. And about when did you start doing expert 18 witness work?</p> <p>19 A. That would be just the beginning of 2000. 20 So, yeah, around -- I mean, I was exposed to this 21 expert witness field maybe around late 1999, but 22 started to work as an expert independently probably 23 beginning of 2001, something like that.</p> <p>24 Q. And how did you get into the expert 25 witness business?</p>

<p style="text-align: right;">Page 26</p> <p>1 A. Yes. I was fortunate enough to pursue my 2 PhD degree under Dr. Richard Engstrom, E-N-G-S-T-R- 3 O-M -- Dr. Engstrom, who is a premier national 4 scholar specializing on elections and voting 5 behavior. 6 So soon after I got my PhD, he asked me to 7 help him prepare some data. I remember roughly -- 8 probably related to the 2000 presidential election 9 -- that was the starting point. 10 Q. And now you've been doing this for over 11 two decades. What specifically would you consider 12 to be your area of expertise? 13 A. My specific area of expertise includes 14 voting behavior. So specifically, I analyzed racial 15 dimension in voting patterns, whether or not race 16 played a role. Essentially, my expert witness work 17 is around how and to what extent race may or may not 18 play a role. 19 Q. And have you -- have you published 20 literature in this field of work? 21 A. Yes, I have. 22 Q. How many pieces of literature would you 23 say you've published? 24 MS. PAVEL: Objection to form. 25 THE WITNESS: I listed my publications on</p>	<p style="text-align: right;">Page 28</p> <p>1 trained in using the most advanced tools in the 2 field. 3 Secondly, more narrowly defined, I was 4 trained in some software programs. In this case, 5 especially due to the growth of software open source 6 programs, especially concerned R language, I've been 7 trained to use the software program to analyze 8 complex data. So I'm also an expert in developing 9 algorithms or functions that are suited for 10 questions related to voting analysis. 11 Q. Okay. So we discussed that you got some 12 of your data from Redistricting Hub. We discussed 13 that you got some of your data from your counsel, 14 right? 15 A. Yes. 16 Q. LDF. Any other places that you got your 17 data from? 18 A. No. 19 Q. Those two places? 20 A. Yes. 21 Q. Did you -- so did you receive -- 22 A. Oh, yeah. 23 Q. Go ahead. 24 A. Sorry. I need to be more complete. 25 Q. Okay.</p>
<p style="text-align: right;">Page 27</p> <p>1 my CV attached in this report too. But just roughly 2 speaking, certainly more than probably 25 articles, 3 professional articles in peer-reviewed journals. 4 And among nine books I wrote, probably two-thirds of 5 them are about racial politics and voting. 6 Q. (BY MR. BRASCHER) One thing I wanted to 7 ask you is, you do some -- in your report, would you 8 agree you do some statistical analysis? 9 A. Yes. 10 Q. What sort of training did you receive to 11 do specifically the statistical analysis that you do 12 in your reports? 13 MS. PAVEL: Objection to form. 14 THE WITNESS: Yeah. That's a very vague 15 question, but I can give you two answers. One is 16 the broad description of my training, and the other 17 is more narrowly defined. 18 The broad overview of my method of 19 training is related to statistical analysis by using 20 the most reliable and advanced methods developed by 21 esteemed scholars, accepted by the field, to 22 generate the most reliable estimates of voting 23 behavior. Since in the U.S. voters cast their 24 votes in privacy, one has to estimate whether race 25 is a factor or not. So generally speaking, I was</p>	<p style="text-align: right;">Page 29</p> <p>1 A. Yeah. So obviously when I say "two 2 sources of data," I also mentioned the second source 3 is demographics. So, yeah, original source is 4 census. So I have to specify. 5 Q. Okay. All right. That's where I was 6 going with it. I was like, "I figured you would 7 have used the census." 8 A. Yeah. Yeah. For sure. 9 Q. What sort of demographic data can you get 10 from the census data? 11 A. Yes. That's a great question. So for 12 voting related analysis, especially because of my 13 role, as I stated, to analyze whether or not race 14 plays a role -- so the demographics that contain 15 information about the voting age population that 16 belong to certain racial groups of interest -- in 17 this case, obviously black voters and white voters. 18 So those tend to be the variables from the census 19 that I need the most. 20 Q. So the census data can show you whether a 21 particular area is more concentrated with non- 22 Hispanic whites or with African-Americans? 23 A. Yes. Exactly. Or not too many, so 24 everything in between. So there's a scale of racial 25 composition.</p>

<p style="text-align: right;">Page 30</p> <p>1 Q. Sure. All right. How many reports have</p> <p>2 you made in this case?</p> <p>3 A. I wrote an original report and then a</p> <p>4 rebuttal report.</p> <p>5 Q. And are those the only reports that you</p> <p>6 have written in this case?</p> <p>7 A. Up to this point, I have submitted these</p> <p>8 two reports, but I do reserve the right to</p> <p>9 modify/supplement more evidence when there's more</p> <p>10 facts and data available.</p> <p>11 Q. Do you currently plan to do that?</p> <p>12 A. At this point, given the evidence that I</p> <p>13 have seen, I have done my duty to provide the best</p> <p>14 analysis to the Court. So at this point, these two</p> <p>15 reports represent what I -- what I can say as an</p> <p>16 expert witness.</p> <p>17 Q. Okay. I'm going to then present you with</p> <p>18 what I got previously marked as Exhibit 2.</p> <p>19 (Exhibit 2 marked.)</p> <p>20 Q. (BY MR. BRASCHER) And I believe this is</p> <p>21 your expert report. Does that look familiar to you?</p> <p>22 MS. PAVEL: Do you have copies for counsel?</p> <p>23 MR. BRASCHER: I do. I have a copy for</p> <p>24 counsel. Again, I didn't know how much paper the</p> <p>25 printer was going to have. I didn't want to push my</p>	<p style="text-align: right;">Page 32</p> <p>1 alternative explanation for the observed differences</p> <p>2 in how white and black voters was sorted into and</p> <p>3 out of the second congressional district. And</p> <p>4 finally, voters' race as compared to their partisan</p> <p>5 preference better explains the changes made to the</p> <p>6 second congressional district specifically within</p> <p>7 Pulaski County.</p> <p>8 Taken together, these opinions lead me to</p> <p>9 conclude that consideration of race was a</p> <p>10 statistically significant factor in the design of</p> <p>11 the second congressional district in the 2021</p> <p>12 enacted plan. And the consideration of voters'</p> <p>13 partisan preference is not a statistically</p> <p>14 supportable alternative explanation for the apparent</p> <p>15 consideration of race.</p> <p>16 Q. Do you have any other opinions in this</p> <p>17 case outside of what you just stated to me?</p> <p>18 A. I submitted my original report, as I said,</p> <p>19 and read the summary of my opinion. But after I</p> <p>20 submitted my report, I received report from Mr.</p> <p>21 Bryan, who is expert for the defendants. And I read</p> <p>22 that report. I did provide more in my rebuttal. So</p> <p>23 if you want me to explain further.</p> <p>24 Q. Go ahead. Yes. Go ahead.</p> <p>25 A. Okay. Sure.</p>
<p style="text-align: right;">Page 31</p> <p>1 luck.</p> <p>2 MS. PAVEL: No worries.</p> <p>3 THE WITNESS: Yep. This is my report.</p> <p>4 Q. (BY MR. BRASCHER) Okay. Then I'm also</p> <p>5 just going to present you with Exhibit 3, which is</p> <p>6 your rebuttal report. If you could also take a look</p> <p>7 through that and confirm for me that is the correct</p> <p>8 report.</p> <p>9 (Exhibit 3 marked.)</p> <p>10 THE WITNESS: Yes, it is.</p> <p>11 Q. (BY MR. BRASCHER) Wonderful. All right.</p> <p>12 So then, we're going to be in Exhibit 2. We'll go</p> <p>13 through your -- your initial report first.</p> <p>14 Let's start with, if you could simply</p> <p>15 state for me -- I understand that you have written</p> <p>16 in here, but if you could state for me generally,</p> <p>17 what are your opinions that are present in this</p> <p>18 report?</p> <p>19 A. Sure. Based on my expertise and my</p> <p>20 examination of the empirical demographic data from</p> <p>21 three recent elections, it is my professional</p> <p>22 opinion that race was a significant factor in the</p> <p>23 configuration of the second congressional district</p> <p>24 of the 2021 enacted plan. Voters' partisan</p> <p>25 preference is not a statistically supportable</p>	<p style="text-align: right;">Page 33</p> <p>1 If I also can use this rebuttal report to</p> <p>2 summarize. That's my last paragraph of my rebuttal</p> <p>3 report.</p> <p>4 In short, the conclusion of my expert</p> <p>5 report, "The consideration of race was a</p> <p>6 statistically significant factor in the design of</p> <p>7 the second congressional district. And that</p> <p>8 consideration of voters' partisan preference is not</p> <p>9 a statistically supportable alternative explanation</p> <p>10 for the apparent consideration of race. It's</p> <p>11 thoroughly supported by my rigorous empirical</p> <p>12 analysis based on widely accepted statistical tests.</p> <p>13 Because he," meaning Mr. Bryan, "relies on</p> <p>14 fundamentally flawed methods and his own unsupported</p> <p>15 conjecture, the Bryan report's analysis lacks any</p> <p>16 such empirical basis for his contrary conclusions,</p> <p>17 and nothing in the Bryan report undermines my</p> <p>18 opinion as set forth in my report."</p> <p>19 So these are the additional opinions.</p> <p>20 Q. Thank you. And do you have any opinions</p> <p>21 in this case that are not contained in either your</p> <p>22 original report or your rebuttal report?</p> <p>23 A. Again, I reserve my right to add more. At</p> <p>24 this point, these two reports convey where I stand</p> <p>25 on this case as for the data available to me.</p>

<p style="text-align: right;">Page 34</p> <p>1 Q. So you have, as of today, no further 2 opinions outside of what's contained in those two 3 reports. Is that accurate?</p> <p>4 A. Yes.</p> <p>5 Q. Okay. So based on what you just said to 6 me -- and we'll go back -- we'll go to Exhibit 2 and 7 stay in that -- try to stay in your original report 8 first. Is it your opinion that the Arkansas 9 congressional map intentionally discriminates on the 10 basis of race?</p> <p>11 A. I'm not a legal expert, I just stated 12 earlier. So with respect to what's intended or 13 what's in the mind of the map maker originally, I'm 14 not here to provide empirical evidence one way or 15 another. But my empirical evidence allows me to 16 analyze whether or not race is a significant factor, 17 whether or not partisan affiliation is a 18 statistically supportable alternative explanation 19 for why black voters and white voters are sorted 20 into CD2. CD2, I mean Congressional District No. 21 2.</p> <p>22 So my empirical evidence does provide the 23 basis for the analysis of one way or another race or 24 party may or may not play a role in the 25 configuration. But I'm not here to provide analysis</p>	<p style="text-align: right;">Page 36</p> <p>1 here to provide any evidence about originally what's 2 in the thought process or intent exactly in the mind 3 of the map drawer. And that's exactly why we play a 4 role as political scientists. We provide empirical 5 data to -- to either support the role of race or 6 oppose that race -- that played a role in the 7 configuration. My evidence shows it does.</p> <p>8 Q. Okay. So -- but just to be clear, you 9 made no conclusions about motivation or intent of 10 the map drawers?</p> <p>11 MS. PAVEL: Objection. Asked and answered. 12 THE WITNESS: Again, in my report, I didn't 13 use the word "motivation." I used the word 14 "configuration." It is what's given to us as 15 empirical scientists with help to try to clarify the 16 empirical pattern and statistically test which 17 factor is indeed the one that should be identified 18 as the role played there. Beyond that, I cannot 19 provide any more evidence.</p> <p>20 Q. (BY MR. BRASCHER) Okay. When you say 21 "race is a significant factor," are you saying it's 22 the only factor?</p> <p>23 A. No. I didn't say that.</p> <p>24 Q. Okay. So it is possible, in your opinion, 25 that there could be other factors that also played a</p>
<p style="text-align: right;">Page 35</p> <p>1 on the intent directly, because I am a political 2 scientist.</p> <p>3 Q. Okay. So you do not have an opinion about 4 whether the Arkansas congressional map was drawn 5 with the intent to discriminate racially?</p> <p>6 A. Again, as I already read, in my reports, 7 the opinions I provided, there is strong empirical 8 evidence that race played a significant role in the 9 configuration of CD2. Party, on the other hand, 10 cannot be sustained as a statistically supportable 11 alternative explanation. So I do believe that my 12 opinion provides strong evidence for how race played 13 a role in the enacted map of 2021.</p> <p>14 Q. I understand that. And I understand that 15 your opinion is that it played a significant factor. 16 I'm trying to drill in on, is it your opinion that 17 the map was drawn intentionally to discriminate on 18 the basis of race?</p> <p>19 MS. PAVEL: Objection. Asked and answered. 20 Q. (BY MR. BRASCHER) Okay. And so, you are 21 not offering an opinion on that issue; is that 22 correct?</p> <p>23 A. I think I have already explained my 24 opinion, that is, I do believe race played a 25 significant role in the configuration, but I'm not</p>	<p style="text-align: right;">Page 37</p> <p>1 role in the drawing of this particular congressional 2 map?</p> <p>3 A. Yeah. Other possible factors that I 4 didn't analyze, but my reports did analyze race and 5 party in terms of race was the factor that played a 6 significant role.</p> <p>7 Q. Sure. I understand that. And I 8 understand that your opinion is that race played a 9 much stronger factor than political party did. I'm 10 just making sure that I'm clear that "significant" 11 doesn't mean "only," and that there could 12 potentially be other factors that you didn't 13 analyze.</p> <p>14 A. Correct.</p> <p>15 Q. Is that accurate?</p> <p>16 A. Correct.</p> <p>17 Q. Okay. All right. Let's -- I want to 18 start, then, with some of the methods that you used 19 so that I can get a better understanding of what 20 those methods are, if that's all right with you.</p> <p>21 A. Sure.</p> <p>22 Q. I'm -- you know what I'm going to do? I'm 23 going to write down on a sticky note -- because this 24 -- how do I pronounce this? Ansolabehere?</p> <p>25 A. Ansolabehere. That's my pronunciation.</p>

<p style="text-align: right;">Page 38</p> <p>1 Q. She's not going to stand a chance at</p> <p>2 writing that, so I am going to write it down on a</p> <p>3 sticky note. That is how that's spelled.</p> <p>4 And pronounce that for me one more time.</p> <p>5 I'm going to try.</p> <p>6 A. Yeah. My pronunciation is "Ansolabehere."</p> <p>7 Q. "Ansolabehere." Okay. Could you -- let's</p> <p>8 just start with -- walk me through what the</p> <p>9 Ansolabehere methods are and how they work.</p> <p>10 A. Sure. So it's a two-step analysis</p> <p>11 developed by this Harvard professor named</p> <p>12 Ansolabehere. The two steps are, number one, making</p> <p>13 analysis about the way -- how the particular</p> <p>14 district is drawn, given how the district can be</p> <p>15 configured from a base, meaning a larger area from</p> <p>16 which voters can be potentially drawn into this</p> <p>17 district. And the larger base area is called</p> <p>18 "envelope."</p> <p>19 So the first step is simply the envelope</p> <p>20 analysis. Who are put in the district from the</p> <p>21 envelope? So the idea is that if the district</p> <p>22 reflects the envelope in terms of the racial</p> <p>23 composition, then there's no reason to believe race</p> <p>24 played any factor. But if the first step shows that</p> <p>25 the district configuration is different from the</p>	<p style="text-align: right;">Page 40</p> <p>1 from party.</p> <p>2 Q. Okay. So one thing I was curious about,</p> <p>3 you mentioned that you've got -- you have racial</p> <p>4 data and there's political data.</p> <p>5 A. Yes.</p> <p>6 Q. As you mentioned in your report, Arkansas</p> <p>7 does not really have good voter registration data in</p> <p>8 -- that identifies an individual as a republican or</p> <p>9 a democrat.</p> <p>10 A. I wouldn't use "good" in that sentence.</p> <p>11 Q. Okay.</p> <p>12 A. But I did write in my report that Arkansas</p> <p>13 does not provide voter registration data that</p> <p>14 contains exact information about race or party</p> <p>15 affiliation fully, because voters are not required</p> <p>16 to fill in the form for their party affiliation.</p> <p>17 Q. Yes. And so, what I wanted to ask is -- I</p> <p>18 know you explained in your report, but I didn't</p> <p>19 quite understand. How then do you determine that a</p> <p>20 group of, say -- we'll use white -- how do you</p> <p>21 determine that this is a white democrat or this is a</p> <p>22 white republican or this is a white nonparty voter?</p> <p>23 A. Thank you for that great question. Let me</p> <p>24 explain.</p> <p>25 So in my report, especially in the</p>
<p style="text-align: right;">Page 39</p> <p>1 base, then clearly race is not a random factor</p> <p>2 anymore. So then it leads to the second step of</p> <p>3 Ansolabehere method, which is further analyze how</p> <p>4 voters are given a particular assignment.</p> <p>5 Here, there are three clients. Voters may</p> <p>6 be moved from another area to this particular</p> <p>7 district. That's called "into movement." Or voters</p> <p>8 that were originally in this given district, but for</p> <p>9 the enacted redistricting plan, they were moved out.</p> <p>10 So this is called "out movement." Or, finally, the</p> <p>11 voters who are retained in the original district.</p> <p>12 So these voters are called "in the core," C-O-R-E.</p> <p>13 So the second step allows us to examine</p> <p>14 the assignment types or categories for voters. And</p> <p>15 the key is to analyze whether it's race or party</p> <p>16 affiliation of these voters that determine how these</p> <p>17 voters are given a particular assignment category.</p> <p>18 And in particular, we can do what we call</p> <p>19 "controlled comparison" in the second step, meaning</p> <p>20 keep the party constant and examine whether race</p> <p>21 played a role, or keep race constant to see whether</p> <p>22 party played a role in the second step. And</p> <p>23 eventually, I added the statistical test in the</p> <p>24 modified Ansolabehere method to use vigorous</p> <p>25 statistical tests to distinguish the role of race</p>	<p style="text-align: right;">Page 41</p> <p>1 "Method" section, I mentioned a particular tool</p> <p>2 available to all of us called "ecological inference"</p> <p>3 -- in short, EI, standing for ecological inference</p> <p>4 -- developed by another Harvard professor called</p> <p>5 Gary King, who designed an algorithm vigorously to</p> <p>6 use the demographic data from the census matched</p> <p>7 with the election data from the Secretary of State</p> <p>8 concerning election outcomes. Merging these two</p> <p>9 data sources, use his method called "ecological</p> <p>10 inference," or EI, one can estimate the extent to</p> <p>11 which voters cast their vote for either a republican</p> <p>12 or democratic candidate in a particular election.</p> <p>13 And then, from each racial group, what's the</p> <p>14 estimate for their support for these candidates by</p> <p>15 party affiliation?</p> <p>16 So by using the EI method, incorporated</p> <p>17 into the two-step Ansolabehere approach, I was able</p> <p>18 to distinguish exactly the extent to which the</p> <p>19 racial or partisan factor play a role, or lack of,</p> <p>20 in the configuration of CD2.</p> <p>21 Q. Okay. So let me see -- let me see if I'm</p> <p>22 understanding this. Basically, you're taking a</p> <p>23 demographic map and overlaying it with the racial</p> <p>24 map to determine the likelihood that a particular</p> <p>25 person in a particular area would be a democrat or a</p>

<p style="text-align: right;">Page 42</p> <p>1 republican voter based on how the people in that</p> <p>2 area tend to vote democrat or republican? Is that a</p> <p>3 fair understanding of how EI works?</p> <p>4 MS. PAVEL: Objection to form.</p> <p>5 THE WITNESS: It is not --</p> <p>6 Q. (BY MR. BRASCHER) Oh, okay.</p> <p>7 A. -- an exact reflection of how it works.</p> <p>8 Again, you gave a long hypothetical situation. But</p> <p>9 in order to make EI work, the algorithm takes into</p> <p>10 consideration many factors. Plus, it's not "the</p> <p>11 map," as you put it. I'm not a map person. I'm not</p> <p>12 an expert on whatever location of a map play a role</p> <p>13 one way or another. But the EI method is a</p> <p>14 statistical procedure that incorporated the two</p> <p>15 sources of data to see patterns of voting. So it's</p> <p>16 not essentially, as you put it, where they are.</p> <p>17 It's essentially how they vote.</p> <p>18 So by incorporating the two sources of</p> <p>19 data EI takes into consideration -- for example, in</p> <p>20 one area, it's very homogeneous white, just to give</p> <p>21 you a perfect specific scenario, 100 percent white,</p> <p>22 and say the republican candidate received 60 percent</p> <p>23 of the vote. Obviously all the votes are from</p> <p>24 white voters, and we know that for a fact. But</p> <p>25 imagine that for not just one area, but so many</p>	<p style="text-align: right;">Page 44</p> <p>1 racial or partisan estimates.</p> <p>2 Q. So when you have -- when you use numbers</p> <p>3 in here, say -- when you say that a certain</p> <p>4 percentage of the black democrat population was</p> <p>5 moved out of Congressional District 2, that is based</p> <p>6 on the ecological inference, the EI, estimate of</p> <p>7 what individuals were black democrats in that area.</p> <p>8 Is that -- is that fair?</p> <p>9 A. EI is a part of it.</p> <p>10 Q. Okay.</p> <p>11 A. But not all of it. Yes. Ansolabehere.</p> <p>12 Q. Okay. So what else goes into that</p> <p>13 determination, then?</p> <p>14 A. Yeah. For sure. So obviously the enacted</p> <p>15 map itself is crucial. So we look at who are these</p> <p>16 -- who are the areas that voters are moved one way</p> <p>17 or another? Move in or move out or retained, as I</p> <p>18 said, in terms of these categories. It is me that</p> <p>19 takes the two key columns in the data that I</p> <p>20 mentioned in my report, the assignment based on the</p> <p>21 2021 enacted map for the voters, whether they stay</p> <p>22 in CD2, moved into CD2, or moved out. That's the</p> <p>23 column I relied on.</p> <p>24 Also compare that to 2011 assignment,</p> <p>25 another column in the data sheet. So -- so clearly,</p>
<p style="text-align: right;">Page 43</p> <p>1 areas in Arkansas.</p> <p>2 So the algorithm takes all these tiny bits</p> <p>3 of information from all areas and then finds the</p> <p>4 pattern statistically and then make the best</p> <p>5 inference given this pattern. What is the white</p> <p>6 support for Republican Party? What is black support</p> <p>7 for Republican Party? And so on and so forth.</p> <p>8 That's the procedure.</p> <p>9 Q. Okay. Okay. I have a better</p> <p>10 understanding now.</p> <p>11 And so, at the core of this, there's --</p> <p>12 there's an algorithm that's doing this.</p> <p>13 A. Mm-hmm.</p> <p>14 Q. Is this an algorithm that you created?</p> <p>15 A. No. Dr. Gary King.</p> <p>16 Q. Dr. Gary King created this algorithm?</p> <p>17 A. Yes.</p> <p>18 Q. Okay. Is this a publicly available</p> <p>19 algorithm?</p> <p>20 A. Yes. It's the most influential widely</p> <p>21 accepted method. Not only in academia. Obviously</p> <p>22 Dr. King is arguably one of the top three</p> <p>23 quantitative scholars in the world. Not just USA.</p> <p>24 But obviously in litigations, including Supreme</p> <p>25 Court, that has accepted EI in many cases concerning</p>	<p style="text-align: right;">Page 45</p> <p>1 I can identify which roles are moved out or moved in</p> <p>2 in my spreadsheet. That has nothing to do with EI</p> <p>3 or the Ansolabehere analysis yet. But once I</p> <p>4 identify these areas, then I run EI. The EI will</p> <p>5 tell me, "Okay. For all those voters that are moved</p> <p>6 out, is it race or party that play a role?" That's</p> <p>7 where EI play a role.</p> <p>8 Q. Okay.</p> <p>9 A. Yeah.</p> <p>10 Q. Okay. So one question I had. We've got</p> <p>11 the, again, Ansolabehere methods. And then, you've</p> <p>12 got the modified Ansolabehere methods.</p> <p>13 A. Yes.</p> <p>14 Q. What is the modification or modifications</p> <p>15 that you've made?</p> <p>16 A. Yes. Again, thank you for that question,</p> <p>17 because I can explain in detail.</p> <p>18 So the Ansolabehere method is simply two</p> <p>19 steps, as I explained. But Dr. Ansolabehere</p> <p>20 originally used North Carolina data by voter</p> <p>21 registration. So there is the voters tally of party</p> <p>22 affiliation and so on and so forth based on</p> <p>23 registration. Again, that's not available in</p> <p>24 Arkansas, because voters were not asked to provide</p> <p>25 such information.</p>

<p style="text-align: right;">Page 46</p> <p>1 So one gets into the situation of it has 2 to be estimated. That's why I incorporated EI 3 method, which I call "modified Ansolabehere method," 4 because Dr. Ansolabehere, in his North Carolina 5 report, didn't use EI. I used it. And I believe 6 it's the best method in the field, accepted by the 7 Court and academia. It's the most important step 8 that I can take to exactly differentiate race from 9 party by estimating with real election data how race 10 or party play a role. 11 And then, finally, it's called "modified" 12 because I also used vigorous statistical tests -- in 13 this case, Chi-square tests -- to see whether it's 14 significant. Again, I use the word "significant" 15 because I'm from the academia that widely practiced 16 this universal rule, that in order to draw a 17 conclusion, say there's association between race and 18 enacted map, it has to overcome the highest vigorous 19 statistical test. It's the universal rule. 20 Especially it's called "95 confidence interval 21 rule." That's what I added in my final test of the 22 -- of the empirical data based on incorporated 23 Ansolabehere analysis with EI method. That's why I 24 call that "modified." 25 Q. Okay. So the -- you mentioned you added</p>	<p style="text-align: right;">Page 48</p> <p>1 Q. Understood. Okay. So you used Chi-square 2 tests. When you refer to "vigorous statistical 3 tests," are you referring to any other tests outside 4 of the Chi-square tests? 5 A. I refer to the universal rule accepted by 6 all sorts of scientists that's called "95 confidence 7 interval," meaning that not only Chi-square, but 8 also all other statistical tests, they all have to 9 follow this rule. 10 Q. Okay. But in terms of the tests that you 11 ran -- right? -- and that you said is where part of 12 the modified part comes from, you've got the Chi- 13 square tests. Are there other tests that I'm 14 missing in here? Or is -- 15 A. Yeah. The Chi-square test -- 16 MS. PAVEL: Objection to form. 17 Go ahead. 18 THE WITNESS: Okay. The Chi-square test 19 itself is a broad test. But there are details, 20 which I added into my report called "Pearson 21 residuals." That's a test specifically designed for 22 us to take a look at exactly how race or party play 23 a role. 24 Say, for example, do we see that it's 25 partisanship or race? So we use the residual to</p>
<p style="text-align: right;">Page 47</p> <p>1 -- you used the term "vigorous" -- or I can't 2 remember if it was "vigorous" or "rigorous" -- 3 A. Yes. 4 Q. Statistical tests. You mentioned Chi- 5 square, which is, you know, essentially a 6 correlation test. Am I -- would you not call it 7 that? 8 A. No. I -- I would be very cautious in 9 using the word "correlation." 10 Q. Okay. 11 A. Because the word "correlation" in 12 statistics has its special meaning. 13 Q. Right. 14 A. There is what we call "correlation 15 coefficient" that vary from negative 1 to positive 16 1. 17 Q. Yes. 18 A. And then, usually they apply it to the 19 highest level of measurement, which is interval 20 level. But in this case, I will use association 21 between two factors, because they are categorical. 22 Q. Sure. 23 A. It doesn't arrive to the statistical level 24 where statisticians professionally use the word 25 "correlation."</p>	<p style="text-align: right;">Page 49</p> <p>1 distinguish race from party by examining 2 specifically the specific categories of association. 3 Say white democratic versus black democratic, which 4 one is more associated with the configuration of 5 CD2? And that's essential. It's not just Chi-square 6 test, which is the broad test, but also the detailed 7 examination of the exact subtype that I added there. 8 MR. BRASCHER: Okay. I am going to take a 9 break. I got to use the restroom. So if we want to 10 go off the record for just a minute. 11 (Off the record from 11:00 a.m. to 11:07 12 a.m.) 13 Q. (BY MR. BRASCHER) Okay. Back on the 14 record? All right. Thank you, Dr. Liu. Let's pick 15 up where we left off. 16 So one thing I wanted to make sure I got 17 clear is when you were talking about the likelihood 18 that partisan preference played a role. Is it your 19 opinion that partisan preference cannot explain how 20 these congressional districts were drawn? 21 A. My opinion is that partisan affiliation 22 cannot be an alternative explanation for how white 23 and black voters are sorted into CD2, so meaning 24 it's not a factor supported by statistical evidence. 25 The party indeed was the reason why these black or</p>

<p style="text-align: right;">Page 50</p> <p>1 white voters are moved the way they are.</p> <p>2 Q. Okay. So based on the stats, the</p> <p>3 statistical data you've looked at --</p> <p>4 A. Yes.</p> <p>5 Q. -- you say it's not -- it can't -- it</p> <p>6 can't be partisanship based on the data?</p> <p>7 MS. PAVEL: Objection to form.</p> <p>8 THE WITNESS: Yeah. My -- my opinion was</p> <p>9 clear, saying that the partisan affiliation should</p> <p>10 not be used as the explanation for what we see, the</p> <p>11 racial groups that were moved in whatever way they</p> <p>12 were. So statistically, it's not sustainable or</p> <p>13 supportable to say it's all due to party</p> <p>14 affiliation.</p> <p>15 Q. (BY MR. BRASCHER) Okay. Could it have</p> <p>16 played any factor?</p> <p>17 MS. PAVEL: Objection to form.</p> <p>18 THE WITNESS: Again, my role is to</p> <p>19 distinguish the role of race from that of party.</p> <p>20 One of the -- may be used to explain the empirical</p> <p>21 evidence that we see, other may not. Or both may</p> <p>22 not. Whatever. But my examination starting from a</p> <p>23 null hypothesis -- N-U-L-L -- meaning there's no</p> <p>24 association whatsoever, we don't assume anything,</p> <p>25 then the next step is to look at what essentially</p>	<p style="text-align: right;">Page 52</p> <p>1 Q. (BY MR. BRASCHER) Yes. Okay. I</p> <p>2 understand that.</p> <p>3 Okay. Also, like I said, we talked</p> <p>4 previously about where the data came from, and the</p> <p>5 data that came from Redistricting Hub -- as you were</p> <p>6 saying, a lot of people use Redistricting Hub; is</p> <p>7 that right?</p> <p>8 A. Again, I'm not a spokesperson or</p> <p>9 representative from that association. I don't know</p> <p>10 to what extent other people use it. But I believe</p> <p>11 they've been in this business for a relatively long</p> <p>12 time.</p> <p>13 Q. Have you done any independent work to</p> <p>14 verify the data that Redistricting Hub provides?</p> <p>15 A. No.</p> <p>16 Q. All right. One thing I wanted to try to</p> <p>17 understand is you used data from three elections; is</p> <p>18 that right?</p> <p>19 A. Correct.</p> <p>20 Q. The 2018 presidential primary election --</p> <p>21 not presidential -- I'm sorry -- 2018 primary</p> <p>22 election, correct?</p> <p>23 A. Gubernatorial.</p> <p>24 Q. Gubernatorial. There we go.</p> <p>25 2020 presidential election and 2022</p>
<p style="text-align: right;">Page 51</p> <p>1 the data say. My conclusion is that it's not the</p> <p>2 party.</p> <p>3 Q. (BY MR. BRASCHER) Sure. I understand</p> <p>4 that. And I understand, as you've said, that race</p> <p>5 played a significant factor. You're saying that</p> <p>6 partisan preference cannot be -- what you said just</p> <p>7 a couple questions ago was, "Cannot be the reason."</p> <p>8 Right? So what I'm trying to make sure I pin down on</p> <p>9 is, can partisan preference have been a little bit</p> <p>10 of the reason?</p> <p>11 MS. PAVEL: Objection to form.</p> <p>12 THE WITNESS: My examination of evidence</p> <p>13 shows otherwise. No.</p> <p>14 Q. (BY MR. BRASCHER) Okay. So it can't be a</p> <p>15 little bit. It definitely has to be no part of the</p> <p>16 -- no part of the map drawing was partisan based.</p> <p>17 MS. PAVEL: Objection to form.</p> <p>18 THE WITNESS: Again, as empiricist, I</p> <p>19 compared the two roles. And whatever happened as</p> <p>20 far as the role that race played, it cannot be</p> <p>21 explained by party. It has to be race. And the</p> <p>22 data itself doesn't show that the party is the</p> <p>23 overwhelming explanation of why we see those</p> <p>24 patterns in the first place. That's what my report</p> <p>25 and my empirical tests lead me to.</p>	<p style="text-align: right;">Page 53</p> <p>1 gubernatorial primary election?</p> <p>2 A. Correct.</p> <p>3 Q. Okay. What -- for what purposes do you</p> <p>4 use each of those three data sets? Are they used for</p> <p>5 the -- actually, I'll just ask that first question.</p> <p>6 For what purposes do you use each of those three</p> <p>7 data sets?</p> <p>8 MS. PAVEL: Objection to form.</p> <p>9 THE WITNESS: The way I use the three</p> <p>10 elections are based on the fact that in Arkansas --</p> <p>11 first of all, for primaries, it's an open primary.</p> <p>12 Voters can decide whichever primary -- whichever</p> <p>13 party's primary they participate. And due to the</p> <p>14 fact there's no party registration data, this is</p> <p>15 only available best data that can allow us as</p> <p>16 empirical scientists to examine who participate,</p> <p>17 say, in democratic primary, who participate in the</p> <p>18 republican primary, all based on their personal</p> <p>19 will. And therefore, the primary elections serve</p> <p>20 this critical role for us to examine their choice,</p> <p>21 their personal choice of participating in a partisan</p> <p>22 election. So that's very important, because in this</p> <p>23 case, my role is to analyze whether party plan --</p> <p>24 party affiliation plays any role in the</p> <p>25 configuration of second congressional district. So</p>

<p style="text-align: right;">Page 54</p> <p>1 that's number one.</p> <p>2 But in response to the Supreme Court's</p> <p>3 decision in Alexander, it is also important to look</p> <p>4 at the 2020 presidential election because it has a</p> <p>5 higher level of turnout involving more voters as</p> <p>6 opposed to primaries. Therefore, the data has more</p> <p>7 complete participation. And there are major</p> <p>8 candidates from both parties, both major parties, as</p> <p>9 the nominees.</p> <p>10 So it is very useful to use presidential</p> <p>11 election to check, indeed, whether the vote choice</p> <p>12 of those participants in the 2020 presidential</p> <p>13 election have anything to do with eventually how the</p> <p>14 political factor plays a role or not in the</p> <p>15 configuration of CD2.</p> <p>16 Both types of analysis, primaries and</p> <p>17 general elections, play very important role for me</p> <p>18 to analyze if I find consistent pattern of</p> <p>19 association between CD2 configuration and race or</p> <p>20 party from all three elections. Then my conclusion</p> <p>21 can be robust. If only one or only two out of</p> <p>22 three, then conclusion is less robust. That's why I</p> <p>23 choose all three.</p> <p>24 Q. (BY MR. BRASCHER) Okay. Thank you.</p> <p>25 So you mentioned that the inclusion of the</p>	<p style="text-align: right;">Page 56</p> <p>1 A. So because the county is the only county</p> <p>2 in Arkansas that was treated differently by the</p> <p>3 enacted plan of 2021 in terms of how the county is</p> <p>4 split three ways in CD2, so -- it was my decision to</p> <p>5 look exactly how race or party play a role inside</p> <p>6 the county's area. That's different from the</p> <p>7 Alexander as well. I didn't do that kind of</p> <p>8 analysis.</p> <p>9 Q. Okay. Explain to me what you mean you</p> <p>10 looked specifically at Pulaski County. What did you</p> <p>11 look at specifically in Pulaski County?</p> <p>12 A. Sure. So I have a section in my original</p> <p>13 report on Pulaski County alone. So what I did in</p> <p>14 that section of my report was based on, again, the</p> <p>15 assumption that there's no association between race</p> <p>16 and enacted plan or party and enacted plan. Just</p> <p>17 started from whatever the benchmark of the Pulaski</p> <p>18 County itself, meaning whatever racial or partisan</p> <p>19 composition of the county itself, and see how that</p> <p>20 still continues when it comes to the composition of</p> <p>21 CD2 itself. If the CD2 itself, as far as the</p> <p>22 Pulaski County is concerned, has a very different</p> <p>23 kind of categories of assignments, say move-in,</p> <p>24 move-out, or retain, typical race or typical party</p> <p>25 affiliation became a target of some uncommon</p>
<p style="text-align: right;">Page 55</p> <p>1 2020 presidential data was in response, at least</p> <p>2 partially, to the Supreme Court's decision in</p> <p>3 Alexander. Is that --</p> <p>4 A. Yes. Correct.</p> <p>5 Q. Okay. And you had -- you submitted a</p> <p>6 report in that Alexander case?</p> <p>7 A. Yes, I did.</p> <p>8 Q. Have you made any other changes to your</p> <p>9 methodology following the Alexander decision?</p> <p>10 A. Yes, I did.</p> <p>11 Q. What other changes have you made?</p> <p>12 A. Yes. As I explained in my "Method"</p> <p>13 section, the modified Ansolabehere methods,</p> <p>14 especially the Chi-square test and the Pearson</p> <p>15 residuals, those are added onto this report ever</p> <p>16 since the Alexander decision.</p> <p>17 Q. Okay. So you added the Chi-squared test,</p> <p>18 the Pearson residuals. You've incorporated the 2020</p> <p>19 presidential data.</p> <p>20 A. Yes.</p> <p>21 Q. Are there any other changes that you have</p> <p>22 made?</p> <p>23 A. Yes. There's also another change I made</p> <p>24 in this report concerning the County of Pulaski.</p> <p>25 Q. Okay.</p>	<p style="text-align: right;">Page 57</p> <p>1 movement, then I look further for evidence. What</p> <p>2 kind of decision was made? Is it race or party?</p> <p>3 That's how I did the analysis for the County of</p> <p>4 Pulaski, again, based on the modified Ansolabehere</p> <p>5 method with statistical tests.</p> <p>6 Q. Okay. So the changes to your methodology</p> <p>7 that you've identified for me are the addition of</p> <p>8 Chi-squared and -- tests and Pearson residuals as</p> <p>9 well as specifically looking at Pulaski County. Are</p> <p>10 there any other modifications that I'm missing? Oh,</p> <p>11 and of course the incorporation of the 2020</p> <p>12 presidential data.</p> <p>13 A. My method was derived from Ansolabehere</p> <p>14 method, so that didn't change, but, as I said, the</p> <p>15 modified version in my current report is different.</p> <p>16 So these are just significant changes between the</p> <p>17 two reports. But the method itself is not</p> <p>18 different.</p> <p>19 Q. Okay. And by "method," of course, you</p> <p>20 mean the Ansolabehere method, the envelope method,</p> <p>21 that sort of stuff. That hasn't changed?</p> <p>22 A. Right. As I laid out earlier, the two</p> <p>23 steps Ansolabehere method, that's not changed. And</p> <p>24 the logic is still the same. But I added robust</p> <p>25 statistical tests about what conclusion we can make,</p>

<p style="text-align: right;">Page 58</p> <p>1 and that's a significant change for sure.</p> <p>2 Q. Okay. So you talked -- okay. So if we're</p> <p>3 using the gubernatorial primary data -- right? So</p> <p>4 2018 and 2022 -- and you're talking about how that,</p> <p>5 particularly with Arkansas, allowed you to identify</p> <p>6 voter preference and such. Is that accurate?</p> <p>7 A. Yeah. To be more precise --</p> <p>8 Q. Okay.</p> <p>9 A. So Arkansas voters had a chance to</p> <p>10 participate in either party's primary. So by using</p> <p>11 the gubernatorial primaries, I can distinguish</p> <p>12 whatever voters' decisions as far as whether they</p> <p>13 joined the democratic primary or they joined the</p> <p>14 republican primary. Obviously my decision of using</p> <p>15 it would let me to -- analyze that decision by</p> <p>16 voters themselves, reveal anything about the</p> <p>17 significance of the party. That's why I did it.</p> <p>18 Q. Does that method account for -- actually,</p> <p>19 back up. I'll withdraw that question.</p> <p>20 I'll start with, you're a political</p> <p>21 scientist, right?</p> <p>22 A. Yes.</p> <p>23 Q. So would you agree with me that voter</p> <p>24 turnout for primary elections is much less than</p> <p>25 general elections?</p>	<p style="text-align: right;">Page 60</p> <p>1 say 2018 or 2022 -- the primary participants are</p> <p>2 usually the good indicator of what they will vote in</p> <p>3 the general as well because the thing you described</p> <p>4 earlier, even though it can be -- it can happen for</p> <p>5 sure, a democrat can vote in the republican primary,</p> <p>6 in the Arkansas open primary system, but usually in</p> <p>7 an off year, there -- there's a tendency that these</p> <p>8 participants, in whatever the party they</p> <p>9 participate, they continue to vote for the candidate</p> <p>10 in general election later on. So their party</p> <p>11 affiliation in the primary is a very useful</p> <p>12 indicator of their real choice.</p> <p>13 Q. Okay. So you're telling me that</p> <p>14 particularly in off-presidential-year primaries,</p> <p>15 that whoever -- whatever primary person votes</p> <p>16 intends to be how they vote in the general election?</p> <p>17 A. There is a tendency of doing that.</p> <p>18 Q. Okay.</p> <p>19 A. And the reason is very simple. The -- if</p> <p>20 you want me to explain why.</p> <p>21 Q. Go ahead. Go ahead.</p> <p>22 A. Because in the presidential year,</p> <p>23 obviously the campaign draw more attention. Voters</p> <p>24 are deciding at a much more intense, personal level.</p> <p>25 So candidates may, for whatever reason, draw voters</p>
<p style="text-align: right;">Page 59</p> <p>1 A. It is usually the case. Again, in</p> <p>2 American primary elections, because the final</p> <p>3 election outcomes don't take place yet -- it's only</p> <p>4 primary. So in general, participation is low. But</p> <p>5 in some primaries in America, we do see high</p> <p>6 participation as well. But in general, yes.</p> <p>7 Q. Okay. So -- but, yeah, we can agree that</p> <p>8 generally --</p> <p>9 A. Yes.</p> <p>10 Q. -- voter turnout is going to be lower in</p> <p>11 the primary than in the general election?</p> <p>12 A. Yes.</p> <p>13 Q. Also, Arkansas, are you aware that</p> <p>14 Arkansas has open primaries?</p> <p>15 A. Yes.</p> <p>16 Q. Okay. Which means that, you would agree,</p> <p>17 someone could decide to vote for the -- in the</p> <p>18 opposite party's primary as their actual preference</p> <p>19 and intention?</p> <p>20 A. Yes.</p> <p>21 Q. Okay. Does your method do anything to</p> <p>22 account for that?</p> <p>23 A. No. But if I can add one more point about</p> <p>24 that. Usually the primaries, especially for off</p> <p>25 years -- by that, I mean not presidential year --</p>	<p style="text-align: right;">Page 61</p> <p>1 from a different party or independent. But in the</p> <p>2 off year where there's no presidential election on</p> <p>3 the top of ticket, it's usually those partisan</p> <p>4 voters that join the primary elections. And they</p> <p>5 continue to vote in the general election. That's</p> <p>6 the reason why.</p> <p>7 Q. Okay. Do we -- is there empirical</p> <p>8 research that supports that sort of finding?</p> <p>9 A. Yes. For sure.</p> <p>10 Q. You also mentioned that Pulaski County was</p> <p>11 treated differently than all the other counties</p> <p>12 because it was split into three different</p> <p>13 congressional districts; is that right?</p> <p>14 A. Yes. I did say that in my report.</p> <p>15 Q. You would agree with me that Pulaski</p> <p>16 County has the highest population of any county in</p> <p>17 Arkansas?</p> <p>18 A. Yes.</p> <p>19 Q. And so, would you agree that when you're</p> <p>20 trying to create as equal voting districts as</p> <p>21 possible in terms of their population, that it might</p> <p>22 be necessary to split up the largest population</p> <p>23 centers?</p> <p>24 MS. PAVEL: Objection to form.</p> <p>25 THE WITNESS: Yes. It is the</p>

<p style="text-align: right;">Page 62</p> <p>1 constitutional requirement, one person, one vote. 2 So in CD2, because of growth of population, the 3 redistricting plan has to deal with that surplus of 4 voters. 5 Q. (BY MR. BRASCHER) All right. Now, we 6 talked about your use of the primary data and then 7 your use -- did you use the 2020 general election 8 data for a different purpose than the 2018 and 2022 9 gubernatorial primary data? Or did they all serve 10 the same purpose? 11 A. Again, both types of elections, primary 12 and general elections, reveal, from their 13 perspective, how race or party may or may not play a 14 role. In the general election particularly, in this 15 case, as I said earlier, is to respond to the 16 Supreme Court's decision in Alexander, that due to 17 the higher level participation in the presidential 18 general election, according to the Court, it is a 19 better measurement of the partisan tilts of 20 elections, being democrat or republican in that 21 general election, according to the Court. And I -- 22 and I take that Court's decision very seriously, and 23 I incorporate it there. 24 Q. So we were talking about how you can use 25 the gubernatorial primary data to determine, again,</p>	<p style="text-align: right;">Page 64</p> <p>1 A. Yes. 2 Q. Okay. Let's -- let's talk about the 3 envelope method. So my understanding with the 4 envelope method is you take the counties that 5 surround, for this instance, Pulaski County. You 6 take the counties that are surrounding -- no. Go 7 ahead and explain to me how I've got that wrong. 8 A. Yes. The envelope approach is based on 9 two layers. The first layer is the district itself 10 under dispute -- in this case, CD2 -- the district, 11 the whole district, and then the base area that is 12 the surrounding larger area around CD2. So in this 13 case, in particular in Arkansas, related to CD2, 14 that envelope contains eight counties, including 15 Pulaski. 16 Q. Okay. Okay. That is what I was trying to 17 say. Thank you for saying it better than I was 18 going to. 19 Okay. And then when you -- you've got 20 here Table 1. If you take a look at Table 1 on page 21 15. 22 A. Yes. 23 Q. And I am sorry that yours is not in color. 24 A. I know the color. Thank you. 25 MS. PAVEL: If it would be easier, I have a</p>
<p style="text-align: right;">Page 63</p> <p>1 generally whether an individual would be republican 2 voting or democrat voting. 3 A. I don't get the question. Please explain. 4 Q. Okay. We were discussing how you use that 5 primary data to determine voter preference. 6 A. Mm-hmm. 7 Q. Right? 8 A. Yes. 9 Q. Do you use the 2020 presidential general 10 election data to do the same thing? 11 A. Well, as I said, both are important for 12 me. The primary gives me the measurement of what 13 party they participated in the primary. So it's an 14 indication of partisan choice. But the presidential 15 election, on the other hand, given the larger 16 participation level that includes more data points 17 that one can analyze between democratic party and 18 republican, what do you choice as voters? So the 19 data reveal, in that sense, a much larger data set, 20 much more inclusive analysis due to more 21 participation there. So they serve different roles, 22 but both are important. 23 Q. I appreciate that. That's what I was 24 trying to figure out, is you said they serve 25 different roles?</p>	<p style="text-align: right;">Page 65</p> <p>1 color copy on this iPad that I can let him use. 2 Q. (BY MR. BRASCHER) I have no issue with 3 that if you want to do that. 4 MS. PAVEL: Would you prefer to see the 5 color copy? 6 THE WITNESS: Yeah, for sure, so that I can 7 be on the same page. 8 MR. BRASCHER: Again, if you want to send a 9 complaint to the Hampton Inn, you're more than 10 welcome to. 11 THE WITNESS: Okay. I'm on page 15. 12 Q. (BY MR. BRASCHER) Okay. Okay. So this 13 table has the voting age population in the envelope 14 and the voting age population in the district. 15 A. Correct. 16 Q. All right. So explain to me, the voting 17 age population in the district, you mean 18 Congressional District 2 in the enacted plan? 19 A. Correct. 20 Q. Okay. And then, the voting age population 21 in the envelope would be Congressional District 2 22 and some of the surrounding area? 23 A. In all the eight counties. 24 Q. Okay. Okay. So that's the envelope that 25 you've created, and then you take that envelope and</p>

<p style="text-align: right;">Page 66</p> <p>1 you look at who got moved in and who got moved out 2 based on their demographic data. Is that accurate? 3 A. That's the second step. 4 Q. Yes. That is the second step. 5 A. Yeah. 6 Q. Okay. So then if we go to Table 2 on page 7 16 -- 8 A. Yes. 9 Q. -- you have now organized the demographic 10 groups that got moved -- that were in the envelope 11 that got moved out of Congressional District 2, into 12 Congressional District 2, and that stayed in 13 Congressional District 2. That's my understanding 14 of what that table means; is that right? 15 A. Yeah. To be more precise, the core 16 obviously contains those voters who were originally 17 in CD2. But the into or out, those two categories 18 of assignment don't necessarily have the envelope 19 requirement. No matter who is moved into, those 20 voters are called the "into" category. 21 Q. Sure. 22 A. Yes. 23 Q. So were there -- in this particular 24 instance, were there voters who were not even in the 25 envelope who got moved in?</p>	<p style="text-align: right;">Page 68</p> <p>1 A. That's correct. 2 Q. Okay. Okay. So if we move, then, to page 3 18 where you have Table No. 3. 4 A. Yes. I'm here. 5 Q. Okay. So, now, this takes basically what 6 you had before, and now we're applying some of the 7 voting data that we have; is that correct? 8 A. Correct. 9 Q. Okay. And so, now we've got white 10 democrats, black democrats, white republicans, black 11 republicans, and white and black others, meaning 12 third party or nonvoters; is that right? 13 A. Correct. 14 Q. Okay. So I know we've talked about it 15 already today, but walk me through how you made this 16 determination, that there were, say, in this 17 envelope area 66,820 white democrat voters in that 18 area? 19 A. Sure. The way to get these numbers is to 20 use the EI method I described earlier, in which all 21 the election data and demographic data merged and 22 then run by EI algorithm. And then, the EI produce 23 the estimate for extent to which each subgroup -- 24 say white dem, black dem, white rep, black rep -- 25 all these subgroups, what's their choice? How do</p>
<p style="text-align: right;">Page 67</p> <p>1 A. I don't believe so, but I need to go back 2 to the data to check exactly. 3 Q. Okay. 4 A. But that should be the case. 5 Q. Okay. 6 A. Even though the method itself doesn't 7 require that. 8 Q. I understand. And so, what this table is 9 telling me is that of all the individuals who got 10 moved out of District 2, 52 percent of them were 11 black; is that -- 12 A. Correct. 13 Q. -- a correct understanding? 14 A. Correct. 15 Q. Okay. Does this method take into account 16 where in District 2 the people are? 17 A. No. 18 Q. Okay. So if, based on the 2010 map, there 19 was a large contingency of black voting age 20 individuals right at the edge of the district, and 21 then the line changes and now those people are 22 outside the district because they were right on the 23 edge of the line, this method would not necessarily 24 account for that geographical distribution; is that 25 correct?</p>	<p style="text-align: right;">Page 69</p> <p>1 they support candidate of interest? And then, we can 2 determine the exact number, so to speak. We can 3 calculate it, compute it. 4 And you do that for the envelope, and you 5 do that for the district one at a time. And then, 6 you compile these numbers together to report on this 7 table. 8 Q. Okay. So you're using the EI that we 9 discussed earlier. 10 A. Yeah. 11 Q. To be clear, this would then be -- these 12 are estimates? 13 A. Yes. 14 Q. Correct? 15 A. Correct. 16 Q. Okay. 17 A. The best estimate, by the way. 18 Q. Sure. Sure, sure. No, no. I understand 19 that. 20 So if I'm reading this correctly, then, 21 what this is saying is that 100 percent of the black 22 republicans that were inside the envelope were put 23 in Congressional District 2; is that right? 24 A. Yes. 25 Q. Okay. While 98 percent of the white</p>

<p style="text-align: right;">Page 70</p> <p>1 republicans were, 91 percent of the black democrats, 2 and 98 percent of the white democrats; is that a 3 correct reading? 4 A. Yeah. I'm reading it as you say it, so 5 I'm trying to compare. 6 Q. Okay. 7 A. Yeah. I take your word. I think you are 8 right. 9 Q. Okay. 10 A. I'm trying to follow. 11 Q. That's fine. Take your time. That's 12 fine. 13 A. Yeah. So 100 percent black republican, 98 14 percent white republican, 91 percent of black 15 democrat, and 98 of white democratic voters assigned 16 from envelope to district. That's the exact 17 numbers. 18 Q. Okay. And so, if I'm reading that 19 correctly, then, based on the estimates of both 20 demographics and who -- voting tendencies, every 21 individual that was a black republican in that area 22 was kept in Congressional District 2? 23 MS. PAVEL: Objection to form. 24 THE WITNESS: Again, based on the estimates 25 from the envelope --</p>	<p style="text-align: right;">Page 72</p> <p>1 Q. All right. And so now we move to -- now 2 it's Method 2, and this is where we take the core 3 and into and out. 4 And so on page 21, this is where you're 5 describing that 55 percent of those who were moved 6 out of Congressional District 2 were black 7 democrats; is that right? 8 A. Yes. That's correct. 9 Q. Okay. Got it. 10 And about what percentage of the entire 11 black democrat population in that area is that? 12 A. Yeah. If you are talking about the whole 13 black or the black democratic -- these are the two 14 different -- 15 Q. Sure. How about -- we'll go -- take both. 16 A. Okay. So I have a table earlier, which is 17 page -- okay. Page 15, the last sentence, "Based on 18 voting age population numbers reported in Table 1, 19 we know that 67 percent of the envelope VAP is 20 white. 22 percent of the envelope voting age 21 population is black." So these are the two numbers 22 we can use as the benchmark -- 23 Q. Okay. 24 A. -- in terms of just race itself. 25 Q. Sure. Okay. And, again, just so that I'm</p>
<p style="text-align: right;">Page 71</p> <p>1 Q. (BY MR. BRASCHER) Yes. 2 A. -- and, then, estimate from the district, 3 the two estimates show that for the black 4 republicans, it's 100 percent moved in, assigned 5 into the district. 6 Q. All right. And so then if we move to page 7 20, which is going to be -- we've got Tables 4 and 5 8 here. 9 A. Yes. 10 Q. This is the same stuff but for the 2018 11 and 2022 primaries instead of the general election; 12 that's right? 13 A. Yes. That's correct. 14 Q. Okay. And so based on the primaries, 15 again, you have in 2018 100 percent of the black 16 republicans -- actually, so this was -- I believe 17 you have a footnote about this, about why it's 18 actually more than -- 19 A. Yes. 20 Q. -- 100 percent, right? 21 A. Yes. Yes. 22 Q. Okay. But based on the estimates, 100 23 percent of the black republicans were kept based on 24 the 2018 voting data; is that right? 25 A. Yes. That's correct.</p>	<p style="text-align: right;">Page 73</p> <p>1 clear, this doesn't necessarily account for what 2 areas inside Congressional District 2 blacks or 3 whites might be concentrated in in terms of 4 geography? 5 A. Could you -- that's a little loaded 6 question I need to understand clearer. 7 Q. Sure. Sure. This doesn't -- this assumes 8 an even distribution throughout the geographical 9 area of whites and blacks, meaning that there aren't 10 specific concentrations. Say, in one corner of 11 Pulaski County would be more black, and a different 12 corner of Pulaski County might be more white? 13 MS. PAVEL: Objection to form. 14 THE WITNESS: When you say "this," are you 15 talking about the number I just quoted to you? 16 Q. (BY MR. BRASCHER) No -- 17 A. Or all my -- 18 Q. Your methods in general. 19 A. Oh, the methods itself in general. I 20 already answered that question. 21 Q. Okay. 22 A. My method in general is to compare race 23 with party and see which one explains the 24 configuration, because that method takes into 25 exactly the racial and partisan affiliation factors</p>

<p style="text-align: right;">Page 74</p> <p>1 among voters. It's not a method that takes into 2 geographic measurements such as location, where 3 exactly in CD2 or in Pulaski.</p> <p>4 Q. Okay.</p> <p>5 A. Those would be a different unit of 6 analysis, obviously, because those are geographic 7 variables. My method is not designed to answer that 8 question.</p> <p>9 Q. Got it. Thank you.</p> <p>10 All right. So on page 23, you describe 11 the use of a Pearson Chi-squared test in the second 12 larger paragraph on page 23; is that right?</p> <p>13 A. Yes.</p> <p>14 Q. Okay. And so, you had -- you talked about 15 that before, the use of the Chi-squared test as well 16 as Pearson residuals. What -- when you're -- the 17 specific test you're referring to here, what numbers 18 are you using to run that test?</p> <p>19 A. Oh, yeah. It's a very important question. 20 Thank you for asking. The Chi-square test is an 21 association test, as I said earlier. What we do in 22 the Chi-square test is to create what we call first 23 a "contingency table," which is simply a cross 24 tabulation between categories, say core. That's one 25 category. And then you get the subgroup, the black</p>	<p style="text-align: right;">Page 76</p> <p>1 chance? If it is by chance, then the null hypothesis 2 is true, meaning no association between the two 3 factors.</p> <p>4 If, instead, it's more than 95 out of 100 5 times, you are sure it's not chance, then you 6 overcome what we call the "universal threshold 95 7 confidence interval." You determine that, indeed, 8 there is an association. That's how we do it.</p> <p>9 Q. Okay. Okay. I have a couple questions 10 about that --</p> <p>11 A. Sure.</p> <p>12 Q. -- but I understand it better after you 13 described it.</p> <p>14 So the numbers and relationships that both 15 the Chi-square test and these Pearson residuals are 16 describing is the numbers that we got back when we 17 were -- when we did the two methods, right? The 18 envelope method and then the modified core, into, 19 out. Those numbers that we got from there, 20 particularly what we've got in Table 6, we then take 21 those numbers and we use those numbers to run these 22 tests; is that right?</p> <p>23 MS. PAVEL: Objection to form.</p> <p>24 THE WITNESS: These are the numbers. Table 25 6 is the numbers. The raw number, we take in, and</p>
<p style="text-align: right;">Page 75</p> <p>1 dem, the white dem, black rep, white rep. All these 2 form the table, which is what we call "contingency 3 table," and give the cell values of this contingency 4 table exact count. Like say --</p> <p>5 (Reporter request for clarification.)</p> <p>6 THE WITNESS: Exact number. Or in more 7 statistical terms, "frequency or observations." 8 These are all statistical terms. Simply, just 9 counting them, how many of them, for each category 10 with respect to each subgroup.</p> <p>11 So once we have that set up in a 12 contingency table, then we apply the Chi-squared 13 test, which takes consideration of what is the exact 14 value versus observed value and a formula, 15 obviously, to calculate Chi-squared in general. And 16 they produce the Chi-square number here, which I 17 reported at the bottom of Table 7.</p> <p>18 Here, if you can take a look, the exact 19 number is 15,667.14. And then, this Chi-square test 20 applied what I described earlier, a 95 confidence 21 interval test. Meaning, whatever these level of 22 association between the two, is it by chance, or it 23 has to be explained by the real association between 24 the two. And the rule of thumb is that 95 out of 25 100 times, can you be confident that this is not by</p>	<p style="text-align: right;">Page 77</p> <p>1 then we run Chi-square.</p> <p>2 Q. (BY MR. BRASCHER) Great. Those round 3 numbers from Table 6 --</p> <p>4 A. Yes.</p> <p>5 Q. -- you then run the tests with those 6 numbers?</p> <p>7 A. Correct.</p> <p>8 Q. Got it. Okay.</p> <p>9 All right. So then, we move -- starting 10 on page 26, we move to the part where you are making 11 the statement that race far better explains the map 12 than voters' partisan preference.</p> <p>13 A. I made a conclusion that race is 14 significant because I did the test. And then based 15 on residuals, indeed, partisan affiliation should 16 not be the explanation for that significant factor 17 of race.</p> <p>18 Q. Okay. Gotcha.</p> <p>19 Okay. When -- I guess this might be just 20 the lawyer in me. But if you look at page 26, you 21 used the term "voters" -- the question is whether 22 voters' race or voters' partisan preference better 23 explains the changes. And your answer is that race 24 better explains the changes. Is that -- that's 25 right?</p>

<p style="text-align: right;">Page 78</p> <p>1 A. Yes. When I say "race is a significant, 2 partisan is not," obviously it's better.</p> <p>3 Q. Okay. Okay. Figure 6 on page 27.</p> <p>4 A. Yes. I'm here.</p> <p>5 Q. Okay. So this is the breakdown of both 6 partisan voting as well as the racial groups in 7 Pulaski County, right?</p> <p>8 A. Yeah. Again, this is contingency table in 9 the graphic form.</p> <p>10 Q. Makes sense. And this is all, again, 11 based on the estimates from the EI algorithm and 12 such?</p> <p>13 A. Correct.</p> <p>14 Q. Okay. And what this seems to show -- tell 15 me if I'm wrong -- is that Pulaski County has more 16 democrats in it than republicans?</p> <p>17 A. Yes.</p> <p>18 Q. Okay.</p> <p>19 A. And also more white democrats than black 20 democrats.</p> <p>21 Q. Okay. Got it.</p> <p>22 As a political scientist, would you agree 23 that it's a practice that one party would want to 24 split up voters from another party in two different 25 voting districts to enhance their opportunities to</p>	<p style="text-align: right;">Page 80</p> <p>1 good indication of why it's race, not party, because 2 you see that disproportionately, it's the black 3 democratic. The bar is super high while other bars 4 are super low, which simply shows that they are the 5 target of the movement in terms of out of CD2. 6 That's a fact. One can consider later by using 7 locational analysis as a GIS expert of whatever -- 8 wherever they are, but the fact that this particular 9 group, the black dem rather than the white dem, if 10 it's -- if it's a party reason, why not white dem? 11 White dem is such a short bar itself raises -- begs 12 the question. Is it really party or race? That's 13 why later on, I did the Chi-square test and the 14 Figure 9 concerning the residuals. That shows just 15 so powerfully it is race, not party.</p> <p>16 So, again, this method doesn't take 17 location per se inside Pulaski whether it's 18 southeast or whatever, but it reveals powerfully the 19 overall scheme of enacted plan is indeed a plan that 20 cannot be explained by party, but race is so 21 powerful as a factor to predict who gets selected to 22 be moved out. That's -- that's what this empirical 23 analysis is all about.</p> <p>24 MS. PAVEL: One quick point of 25 clarification for his record, earlier in his answer,</p>
<p style="text-align: right;">Page 79</p> <p>1 win?</p> <p>2 MS. PAVEL: Objection to form.</p> <p>3 THE WITNESS: I'm not a map drawer, so that 4 is not what I am providing my opinion on.</p> <p>5 Q. (BY MR. BRASCHER) Okay. All right. And 6 so, then, Figure 7 on page 28, so what this is 7 saying is that a large portion -- I guess if we want 8 to do the math on it, it would be probably 60ish 9 percent -- of the people that were moved -- that 10 were moved around were black democrats, right? 11 That's what this is saying?</p> <p>12 A. Again, the 60 percent, obviously, I cannot 13 calculate at this point.</p> <p>14 Q. Sure.</p> <p>15 A. So -- but these numbers are based on the 16 EI estimate.</p> <p>17 Q. Sure. And so, again, does this take into 18 account at all where inside Pulaski County the 19 individual?</p> <p>20 MS. PAVEL: Objection to form.</p> <p>21 THE WITNESS: Again, my method is a method 22 that deals with race and party simultaneously. It's 23 not a geo test, so it doesn't incorporate location 24 as a variable. But I need to emphasize the fact 25 that this particular table, Table 7, gives us a very</p>	<p style="text-align: right;">Page 81</p> <p>1 Dr. Liu referred to a Table 7. Just for the 2 record, he was looking at Figure 7 in the record on 3 page 28.</p> <p>4 MR. BRASCHER: No problem.</p> <p>5 MS. PAVEL: There is a separate Table 7 6 somewhere else, so I wanted to be clear.</p> <p>7 MR. BRASCHER: Got it. And I might have 8 said, "Table 7." If I did, my apologies.</p> <p>9 THE WITNESS: Thank you for the 10 clarification.</p> <p>11 MS. PAVEL: No worries.</p> <p>12 Q. (BY MR. BRASCHER) Okay. So I understand 13 what you're saying, Dr. Liu. And I understand that 14 what you're saying is this shows to you that the -- 15 these individuals were not being moved around based 16 on their party, but based on their race, right? 17 That's what you're finding here. You are looking at 18 just those two variables and no other variables to 19 explain the movement. Is that -- is that fair?</p> <p>20 A. Well, it's not completely fair. As I 21 already explained, this method I'm using deals with 22 race and party and put them together -- against each 23 other and see which one statistically comes out as 24 significant. So that's number one.</p> <p>25 Number two, the fact -- we are talking</p>

<p style="text-align: right;">Page 82</p> <p>1 about inside Pulaski County, which is a location, 2 obviously, inside Pulaski County, who are selected 3 to be moved out? That's what my report is all about. 4 And that section concerning Pulaski County itself 5 says "Clearly it is race, not party." So inside the 6 county, it's the race, not a party. And there is 7 very good reason to use the empirical finding from 8 my tables and charts to distinguish the two. But 9 with respect to whether or not a particular 10 neighborhood or particular building that is black or 11 mixed of blacks and whites, that's not what my 12 method is about.</p> <p>13 Q. Sure. I understand that. I guess my 14 question was just slightly different, which is, 15 there could be any number of factors that go into 16 why the map is the way that it is. You focus on 17 race and political party?</p> <p>18 A. Correct.</p> <p>19 Q. And my understanding is that there aren't 20 any other factors that you're looking at. You're 21 looking at those two factors.</p> <p>22 A. Again, to say that I only look at those 23 two factors is simplification, to say the least, 24 because Pulaski is a part of CD2. I pinpoint to 25 Pulaski itself, because of its location, it's the</p>	<p style="text-align: right;">Page 84</p> <p>1 So it's a test of the result of this 2 movement. What did it do to black voters, white 3 voters, republican voters, democratic voters? Or the 4 cross tabulation, white democratic, black 5 democratic. All these things are what I cared about 6 in this analysis. So it's not a geo analysis by 7 nature, but it's an analysis that provides evidence 8 for decisions on the enacted map and the 9 configuration of it.</p> <p>10 So I do provide opinion on movements, you 11 know, groups. All these things matter to me.</p> <p>12 Q. Okay. All right. I think that is all the 13 questions I had regarding your original report.</p> <p>14 MS. PAVEL: Just a quick housekeeping note, 15 I note that I had provided the witness with a color 16 copy of the report. Plaintiffs would object to 17 entry into evidence a black and white version of 18 this report, because obviously some of the tables 19 are not comprehensible anymore in black and white.</p> <p>20 MR. BRASCHER: Yeah. That's fine. We can 21 go off the record and figure out how we want to do 22 that.</p> <p>23 (Off the record from 12:04 p.m. to 12:13 24 p.m.)</p> <p>25 Q. (BY MR. BRASCHER) All right, Dr. Liu.</p>
<p style="text-align: right;">Page 83</p> <p>1 most important location in CD2 to analyze.</p> <p>2 So even though I don't use specific 3 geographic indicator to differentiate voters' exact 4 location, but the fact I did analyze Pulaski itself 5 is a manifestation that, as a political scientist, I 6 do pay attention to overall where they are.</p> <p>7 Q. Okay.</p> <p>8 A. For sure.</p> <p>9 Q. Are there any other factors you took into 10 account outside of what you've described?</p> <p>11 A. What do you mean outside of what I -- 12 could you explain?</p> <p>13 Q. We've talked about race. We've talked 14 about partisan preference. And we've now talked 15 about geography and whether -- you know, to what 16 extent that plays a role. Are there any other 17 factors that could go into why a map gets drawn the 18 way it does, that you have looked at in your 19 research, in your opinions here?</p> <p>20 A. Yeah. I did look at the specific 21 categories of assignments, right? So core, into, and 22 out. All these movements of voters are driven by 23 whatever decision of the enacted map. The enacted 24 map moved these people around from one place to 25 another.</p>	<p style="text-align: right;">Page 85</p> <p>1 Thank you. We will now move to your rebuttal 2 report.</p> <p>3 Could you please -- we'll just start with: 4 What did you write your rebuttal report in response 5 to?</p> <p>6 A. I wrote it in the opening. I responded to 7 especially Sections 8 through 10 of his report.</p> <p>8 Q. Okay. And what are your opinions about 9 that portion of his report?</p> <p>10 A. Yes. I can read my opinion here stated on 11 page 1. Number 1, "Mr. Bryan's methodology lacks 12 basic scientific rigor, and many of his conclusions 13 are a result of ecological fallacy, which occurs 14 when overarching conclusions are made about specific 15 individuals or subgroups simply based on 16 observations of larger groups or populations."</p> <p>17 Number 2, "Mr. Bryan's analysis therefore 18 fails to demonstrate that the design of CD2 in the 19 2021 enacted plan was driven by the consideration of 20 partisan advantage, and his assertions regarding the 21 role of political performance in the design of the 22 2021 enacted plan are unsupported conjectures."</p> <p>23 Number 3, "For related reasons, Mr. 24 Bryan's discussion of apparent cracking in 25 southeastern Pulaski County and different turnout</p>

<p style="text-align: right;">Page 86</p> <p>1 rates are speculative and unpersuasive. Therefore, 2 nothing in the Bryan report undermines my opinions 3 as set forth in my report, which are based on more 4 rigorous and empirical methods." 5 Q. Okay. So then, describe for me what you 6 feel are the biggest flaws in the report. 7 A. Okay. From page 2 to page -- page 7, I 8 describe in detail the flaws. If you want me to 9 summarize -- 10 Q. Yes. Please do. 11 A. -- I'll just give some highlights. 12 Q. Yes. 13 A. So I explained why the method he used is 14 driven by his observations of one variable at a 15 time, being political party or race. They are not 16 real statistical analysis by considering at least 17 two factors at the same time. I explained why in 18 science we all follow this fundamental rule of 19 making comparison before we provide any opinion or 20 conclusion on which factor explained whatever 21 phenomenon of interest. 22 So I'll just give you a quick 23 illustration. Nobody should use a particular 24 variable to explain itself, say this particular 25 Variable A is because of A. Obviously that's not a</p>	<p style="text-align: right;">Page 88</p> <p>1 because, at the lower level, things may be very 2 different. What he did in his report, in essence, 3 is that to use what he found at the district level 4 based on his measurement of republican performance, 5 arguing that, "Look, these district levels show that 6 2021 map is better than 2011 map" -- but it says 7 nothing about whether that performance is a result 8 of race or whatever, something else he wants to talk 9 about. At most, it's bivariate analysis. So it's 10 not a vigorous test. 11 And in making conclusion in an overarching 12 way by arguing, "Look, race is not a factor, party 13 is a factor," that is ecological fallacy. So these 14 are the main problems in his flawed method. 15 Q. Okay. Let me ask a few questions about 16 those. We'll start with -- one of the things you 17 mentioned is that you use rigorous scientific 18 testing and he does not. 19 A. Yes. 20 Q. Right? Are you -- when you say that, are 21 you referring to the fact that you use Chi-squared 22 tests and Pearson residuals and he does not? Is that 23 what you're referring to? 24 A. That's one major part of it. 25 Q. What is the other parts of it, then?</p>
<p style="text-align: right;">Page 87</p> <p>1 scientific explanation. It's secular. At most, no 2 matter what you do about this particular variable 3 alone, it's unvaried analysis. 4 So you at least need to introduce another 5 variable simultaneously, say A explains B. So two 6 variables here, A and B. But even if that's in a 7 project of empirical research, it's still not enough 8 because, at most, at that time, one can draw a 9 conclusion about a correlation. There's nothing one 10 can go beyond that. Nobody can know whether 11 there's alternative explanation or why the 12 correlation happens in the first place at that 13 point. 14 So in comparison, what I did in my report 15 is to look at race and party simultaneously. And I 16 used statistical tests based on 95 confidence 17 interval. So my tests are vigorous, and they are 18 following the standard of science. His is not. And 19 his method in particular commits a vital error 20 called "ecological fallacy," and that is to say when 21 somebody observes certain things at a larger group 22 or population level, he or she should not make 23 assertions that it also happens at individual level 24 or subgroup level. If you -- if he or she does 25 that, it's simply making an ecological fallacy</p>	<p style="text-align: right;">Page 89</p> <p>1 A. The other part is where I describe in 2 detail controlled comparison. Controlled comparison 3 means that you put two factors together and compare 4 how each contribute or fail to contribute. And the 5 rule of thumb is to hold one of the two variables 6 constant and see how you're deep in the variable, or 7 the thing you want explained varied as you change 8 the other variable values. That's called controlled 9 comparison. I did that in a lot of my tables, which 10 we just went through earlier. But he has not done 11 that in his report. 12 Q. Okay. And does that -- the second thing 13 that you just described, is that along the same 14 lines as what you were talking about with the fact 15 that he uses a bivariate analysis, meaning that 16 he's only looking at two variables? Is that the same 17 sort of issue? 18 A. Yeah -- 19 MS. PAVEL: Objection to form. 20 Go ahead. 21 THE WITNESS: So "controlled comparison," 22 by definition, you need to have three variables at 23 the same time. The final variable, you want to 24 explain it. That's what we call the "dependent 25 variable." And then the two other variables are</p>

<p style="text-align: right;">Page 90</p> <p>1 competing to try to explain the dependent variable. 2 You need to do that at the same time, not one at the 3 time. At most, if you do one at a time, it's only 4 univaried or, at most, bivariate. So that's 5 related. 6 Q. (BY MR. BRASCHER) Okay. And your 7 variables, you're saying that your two independent 8 variables are race and partisan preference, and your 9 independent variable is -- or your dependent 10 variable -- I'm sorry -- is where the individual 11 ended up, whether they were in the district or not? 12 A. The configuration of CD2, yes. 13 Q. Okay. Okay. And you were saying that the 14 -- Mr. Bryan's report only looks at race as it 15 relates to where the person is or voter preference 16 as it relates to where the person is? 17 A. Separately. Separately. 18 Q. Okay. 19 A. Not simultaneously. 20 Q. Got it. 21 What would he needed to have done for it 22 to be simultaneous instead of separately? 23 A. Well, I came up with the best method. The 24 Ansolabehere method, approved by Supreme Court, and 25 EI method, approved by Supreme Court, and</p>	<p style="text-align: right;">Page 92</p> <p>1 A. Yes. 2 Q. Okay. But, for example, putting them in 3 the same table? 4 A. Yes. In the same table. And then, run 5 the Chi-square test and see the residuals. 6 Q. Okay. That -- that's what you would say 7 is the main lack of scientific rigor that is present 8 in Mr. Bryan's report that you have? 9 MS. PAVEL: Objection to form. 10 THE WITNESS: In comparison between his and 11 mine, obviously I reached the scientific standard 12 that is universally applied to all social science 13 research. I did and he didn't. I don't see any 14 tests actually whatsoever in his report. 15 Q. (BY MR. BRASCHER) All right. So one thing 16 you say, on page 4 here -- let me find exactly 17 where. You say at the end of the second paragraph 18 here on page 4, you say, "In sum, the Bryan report 19 does not disentangle the role of race vis-a-vis 20 party." You agree with that statement, right? 21 A. Yes. That's what I wrote there. 22 Q. Okay. And you -- but you say that you do 23 -- I would assume, then, if you're saying that he 24 does not, you do disentangle the role of race vis-a- 25 vis party?</p>
<p style="text-align: right;">Page 91</p> <p>1 incorporate the two. I don't know what he wants to 2 do. I cannot speak for him. If there is such a 3 thing, I would evaluate to see whether it's valid or 4 not. 5 Q. Sure. Okay. So yours are simultaneous 6 because you have broken them up into the different 7 categories saying, "I've got white democrat, black 8 democrat, white republican, black republican," and 9 for those reasons you've got the two variables 10 together, and at the same time, you've got them 11 separated because you've got white republican, black 12 republican. Is that what you're saying? 13 MS. PAVEL: Objection to form. 14 THE WITNESS: It is related, but not 15 completely. I mean, first of all, my method has 16 this EI RxC. Which allows me to compare different 17 subgroups at the same time. So that's number one, 18 which he didn't do. 19 Number two, as you said, I do have white 20 dem, black dem, white rep, black rep, all these 21 subgroups. The reason is simple. Because I can 22 hold either party constant or race constant. 23 So it's not I just break them down. It's 24 how I compare the matters. 25 Q. (BY MR. BRASCHER) How you compare.</p>	<p style="text-align: right;">Page 93</p> <p>1 A. Yes. I specifically say I did, he didn't. 2 Q. Okay. So then because you have 3 disentangled the two of them, you can say 4 definitively to me now that party was not a factor? 5 MS. PAVEL: Objection to form. 6 THE WITNESS: I stated in my original 7 report and repeated here -- I can read that specific 8 conclusion in a precise way again. So "Mr. Bryan's 9 analysis, therefore, failed to demonstrate that the 10 design of CD2 in the 2021 enacted plan was driven by 11 the consideration of partisan advantage, and his 12 assertions regarding the role of political 13 performance in the design of the 2021 enacted plan 14 are unsupported conjecture." That's exactly what I 15 said. 16 Q. (BY MR. BRASCHER) Okay. All righty. 17 Let's see. 18 On page 6, at the top of the second 19 paragraph, you have a sentence. You say "Because of 20 these methodological flaws, the Bryan report does 21 not show through actual empirical analysis that the 22 increase of republican shares is statistically 23 significant." You agree with that? 24 A. That's what I wrote. 25 Q. Okay. Explain to me what would be</p>

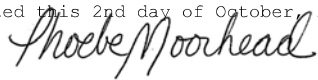
<p style="text-align: right;">Page 94</p> <p>1 statistically significant, then.</p> <p>2 A. Yeah. Sure. That's a great question. So</p> <p>3 in statistics, we always test whatever statement</p> <p>4 with the vigor, what I called earlier, the 95</p> <p>5 confidence interval, as the threshold, minimum. So</p> <p>6 he made argument that between 2021 enacted map and</p> <p>7 2011 old enacted map, look, he says, "The</p> <p>8 republicans perform better." But his numbers are all</p> <p>9 2.0, 2.5 difference. All those numbers, according</p> <p>10 to his data. But he never performed any tests</p> <p>11 whether this increase is significant or not.</p> <p>12 Because anybody who uses any election data can find</p> <p>13 some variation one way or another. But whether that</p> <p>14 comes at even basic statistical test, what we call</p> <p>15 the "means test," are the two means different,</p> <p>16 really, from each other? Is it by random factors,</p> <p>17 just a little bit different? Or really significant</p> <p>18 different? He has no tests whatsoever on that.</p> <p>19 Q. Okay. So you used the number 2.0, right?</p> <p>20 So --</p> <p>21 A. That's what he wrote.</p> <p>22 Q. Yes.</p> <p>23 A. I didn't write that.</p> <p>24 Q. Right. So an increase in the republican</p> <p>25 chairs by 2 percent.</p>	<p style="text-align: right;">Page 96</p> <p>1 different partisan groups." You agree with that?</p> <p>2 A. Yes, I wrote that.</p> <p>3 Q. Okay. So you also -- your report --</p> <p>4 correct me if I'm wrong -- doesn't discuss voter</p> <p>5 turnout; is that right?</p> <p>6 A. No. It's not correct.</p> <p>7 Q. Okay.</p> <p>8 A. As I explained in this rebuttal report, my</p> <p>9 report did take consideration of turnout. And I had</p> <p>10 -- in particular -- if I can go back to my report.</p> <p>11 Q. Go ahead.</p> <p>12 A. Where I provided subgroups, including the</p> <p>13 other -- let's see. Which table here? Yeah. For</p> <p>14 instance, Table 5, that's about 2018 gubernatorial</p> <p>15 primaries. Table 4, that's about 2022</p> <p>16 gubernatorial. And also Table 3 about the 2020</p> <p>17 presidential election. In all these three tables, I</p> <p>18 reported the "other" category, broken down by race,</p> <p>19 the white other, the black other. So in order to</p> <p>20 get these numbers, I did take into consideration of</p> <p>21 turnout. So those people who didn't turn out in</p> <p>22 literature called "nonvoters," the EI methodology</p> <p>23 allowed me to do estimation for each election to</p> <p>24 what extent the nonvoters existed.</p> <p>25 So I can put those numbers in my report by</p>
<p style="text-align: right;">Page 95</p> <p>1 A. Yes.</p> <p>2 Q. Is it your opinion that that is not</p> <p>3 statistically significant?</p> <p>4 A. No. I didn't say that. I said he didn't</p> <p>5 bring any whatever statistical analysis. Just --</p> <p>6 his is just description. Okay. So this one,</p> <p>7 according to his measurement, republican performed</p> <p>8 this. In that one, republican performed that. He</p> <p>9 just described it. There's no real statistical</p> <p>10 analysis. What's really difference between the two?</p> <p>11 Is this statistically significant? Or is it simply</p> <p>12 based on this margin of difference for two elections</p> <p>13 under his analysis?</p> <p>14 So there's nothing there to allow readers</p> <p>15 to draw any conclusion one way or another.</p> <p>16 Q. Okay. That -- I understand what you're</p> <p>17 saying.</p> <p>18 Is it -- do you have an opinion on whether</p> <p>19 a 2 percent increase in republican vote shares is</p> <p>20 statistically significant?</p> <p>21 A. I don't.</p> <p>22 Q. Okay. Page 9. The top of that first</p> <p>23 larger paragraph. You say, "However, it is notable</p> <p>24 that the Bryan report does not discuss the relative</p> <p>25 turnout of different racial groups or even of</p>	<p style="text-align: right;">Page 97</p> <p>1 comparing, for example, the white others and black</p> <p>2 others. These are the people who didn't vote for</p> <p>3 republican or democratic, or they didn't participate</p> <p>4 at all. So in this way, there is the exact</p> <p>5 measurement of the effect of turnout broken down by</p> <p>6 race.</p> <p>7 Q. Okay. My understanding of those "other"</p> <p>8 categories is that that is both individuals -- let</p> <p>9 me do the question again.</p> <p>10 My understanding of those "other"</p> <p>11 categories is that it is both votes for not the two</p> <p>12 main candidates as well as people who didn't vote;</p> <p>13 is that correct?</p> <p>14 A. They didn't -- they didn't vote for the</p> <p>15 two major party. That is, they may vote for a minor</p> <p>16 party. Right? And of the people who didn't vote.</p> <p>17 Yes. That's correct. But usually, as you know,</p> <p>18 Arkansas is a state with the two-party system,</p> <p>19 especially Republican Party is the dominant party</p> <p>20 right now. So the vote for the minor party</p> <p>21 candidate, that's very slim.</p> <p>22 Q. Okay. I understand that, but it is -- it</p> <p>23 is -- it would be present in these numbers?</p> <p>24 A. Yes. Yes. Yes. Correct.</p> <p>25 Q. All right. Well, thank you, Dr. Liu.</p>

<p style="text-align: right;">Page 98</p> <p>1 I'm going to take one more break, make sure that I</p> <p>2 -- see if I have anything to follow up with, and</p> <p>3 then we'll -- we'll go from there.</p> <p>4 (Off the record from 12:36 p.m. to 12:40</p> <p>5 p.m.)</p> <p>6 Q. (BY MR. BRASCHER) All right. I just have</p> <p>7 a few questions to wrap this up, Dr. Liu. A couple</p> <p>8 of these are more perfunctory. Did you rely on any</p> <p>9 other plaintiffs' expert reports to form your</p> <p>10 opinions in this case?</p> <p>11 A. No.</p> <p>12 Q. When we used the term and you used the</p> <p>13 term "assignment category," are we meaning a voters</p> <p>14 assignment into core, into, or out? Is that what</p> <p>15 we're referring to?</p> <p>16 A. Yes.</p> <p>17 Q. Okay. Just wanted to make sure we were</p> <p>18 all using the same lingo.</p> <p>19 The three variables that you've discussed</p> <p>20 that you measured in this case are voter assignment,</p> <p>21 race, and party preference; is that right?</p> <p>22 A. In the Chi-square test, yes.</p> <p>23 Q. All right. And then, just a few questions</p> <p>24 that I want to confirm. A voter's geographic --</p> <p>25 sorry. Restart.</p>	<p style="text-align: right;">Page 100</p> <p>1 BY MS. PAVEL:</p> <p>2 Q. I think you testified several times today</p> <p>3 that you're not a demographer or a map maker; is</p> <p>4 that correct?</p> <p>5 A. Yes.</p> <p>6 Q. And that you're not a lawyer; is that</p> <p>7 correct?</p> <p>8 A. Yes.</p> <p>9 Q. Are you offering any opinion in this case</p> <p>10 one way or another about what a map drawer would</p> <p>11 need to do to comply with one person, one vote, in</p> <p>12 drawing congressional districts in Arkansas?</p> <p>13 A. I have no opinion.</p> <p>14 Q. And are you offering in this case any</p> <p>15 opinion one way or another on whether a map maker</p> <p>16 would need to split Pulaski County specifically to</p> <p>17 comply with one person, one vote?</p> <p>18 A. I have no opinion.</p> <p>19 Q. Okay. Earlier today, counsel asked you</p> <p>20 some questions about what you did to prepare for</p> <p>21 this deposition. Do you remember that?</p> <p>22 A. Yes.</p> <p>23 Q. And I believe that you testified that you</p> <p>24 reviewed the documents that we produced on Monday;</p> <p>25 is that correct?</p>
<p style="text-align: right;">Page 99</p> <p>1 A voter's geographic proximity to the</p> <p>2 border of Congressional District 2 is not a variable</p> <p>3 that you considered, correct?</p> <p>4 A. Correct.</p> <p>5 Q. Okay. The effect of moving precincts on</p> <p>6 the -- I'm going to get the word wrong --</p> <p>7 contiguousness -- contiguity -- of a district is not</p> <p>8 a variable you considered; is that correct?</p> <p>9 A. It is correct. Because as I said earlier,</p> <p>10 those are the geographic measurements, which my</p> <p>11 method has no way to match with.</p> <p>12 Q. Sure. Okay. The effect of moving</p> <p>13 precincts on the compactness of a district is also</p> <p>14 not a variable that you measured, right?</p> <p>15 A. Yeah. Compactness is another geographic</p> <p>16 measurement that my method doesn't incorporate.</p> <p>17 Q. Okay. Same with the assignment of a</p> <p>18 voter's neighbors. That's also not a variable that</p> <p>19 you considered; is that correct?</p> <p>20 A. Correct.</p> <p>21 MR. BRASCHER: Okay. I have nothing</p> <p>22 further. I pass the witness.</p> <p>23 MS. PAVEL: All right. Just a couple of</p> <p>24 quick questions for you, Dr. Liu.</p> <p>25 EXAMINATION</p>	<p style="text-align: right;">Page 101</p> <p>1 A. Yes. And data as well.</p> <p>2 Q. Okay. Did you meet with anybody to</p> <p>3 prepare for your deposition?</p> <p>4 A. Yes.</p> <p>5 Q. Who did you meet with?</p> <p>6 A. I met lawyers -- oh, the counsel for the</p> <p>7 plaintiffs.</p> <p>8 Q. Did you meet with anyone who is not</p> <p>9 counsel for the plaintiffs?</p> <p>10 A. No.</p> <p>11 MS. PAVEL: Okay. I have no further</p> <p>12 questions.</p> <p>13 MR. BRASCHER: Nothing from me.</p> <p>14 (Proceedings concluded at 12:44 p.m.)</p> <p>15</p> <p>16</p> <p>17</p> <p>18</p> <p>19</p> <p>20</p> <p>21</p> <p>22</p> <p>23</p> <p>24</p> <p>25</p>

BAODONG LIU

September 25, 2024

102 to 104

<p style="text-align: right;">Page 102</p> <p style="text-align: center;">REPORTER CERTIFICATE</p> <p>1 I, Phoebe S. Moorhead, a Registered Professional</p> <p>2 Reporter and Certified Realtime Reporter, do hereby</p> <p>3 certify: That the deposition of DR. BAODONG LIU,</p> <p>4 the witness in the foregoing deposition named, was</p> <p>5 taken on September 25, 2024; that said witness was</p> <p>6 by me, before examination, duly sworn to testify the</p> <p>7 truth, the whole truth, and nothing but the truth in</p> <p>8 said cause; That the testimony of said witness was</p> <p>9 reported by me in stenotype and thereafter</p> <p>10 transcribed into typewriting and that a full, true,</p> <p>11 and correct transcription of said testimony so taken</p> <p>12 and transcribed is set forth in the preceding pages;</p> <p>13 That in accordance with Rule 30(e), no counsel for</p> <p>14 any party nor deponent having requested on the</p> <p>15 record the right to review the transcript, the</p> <p>16 Original transcript has been sealed and returned to</p> <p>17 the attorney noticing the deposition. I further</p> <p>18 certify that I am not of kin or otherwise associated</p> <p>19 with any of the parties of said cause of action and</p> <p>20 that I am not interested in the event thereof.</p> <p>21 Certified and dated this 2nd day of October, 2024.</p> <p>22 </p> <p>23</p> <p>24</p> <p>25 PHOEBE S. MOORHEAD, RMR, CRR</p>	<p style="text-align: right;">Page 104</p> <p style="text-align: center;">DECLARATION</p> <p>1 Deposition of: Baodong Liu Date: 09/25/2024</p> <p>2 Regarding: THE CHRISTIAN MINISTERIAL ALLIANCE vs JOHN THURSTON</p> <p>3 Reporter: Phoebe Moorehead. jpg</p> <p>4</p> <p>5</p> <p>6</p> <p>7 I declare under penalty of perjury the following to be</p> <p>8 true:</p> <p>9</p> <p>10 I have read my deposition and the same is true and</p> <p>11 accurate save and except for any corrections as made</p> <p>12 by me on the Correction Sheet herein.</p> <p>13</p> <p>14 Signed at _____,</p> <p>15 on the _____ day of _____, 20____.</p> <p>16</p> <p>17</p> <p>18</p> <p>19</p> <p>20</p> <p>21</p> <p>22</p> <p>23</p> <p>24 Signature: _____</p> <p>25 Baodong Liu</p>
<p style="text-align: right;">Page 103</p> <p style="text-align: center;">CORRECTION SHEET</p> <p>1 Deposition of: Dr. Baodong Liu Date: 09/25/24</p> <p>2 Regarding: Christian Ministerial et al vs Thurston</p> <p>3 Reporter: Moorehead</p> <p>4</p> <p>5</p> <p>6 Please make all corrections, changes or</p> <p>7 clarifications to your testimony on this sheet,</p> <p>8 showing page and line number. If there are no</p> <p>9 changes, write "none" across the page. Sign this</p> <p>10 sheet and the line provided.</p> <p>11 Page Line Reason for Change</p> <p>12 _____</p> <p>13 _____</p> <p>14 _____</p> <p>15 _____</p> <p>16 _____</p> <p>17 _____</p> <p>18 _____</p> <p>19 _____</p> <p>20 _____</p> <p>21 _____</p> <p>22 _____</p> <p>23 _____</p> <p>24 Signature: _____</p> <p>25 Dr. Baodong Liu</p>	

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