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IN THE COMMONWEALTH COURT OF PENNSYLVANIA

League of Women Voters of Pennsylvania, *et al.*,	
Petitioners,	Civ. No. 261 MD 2017
v.	
The Commonwealth of Pennsylvania, *et al.*,	
Respondents.	

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LEGISLATIVE RESPONDENTS' PROPOSED FINDINGS OF FACT AND CONCLUSIONS OF LAW

Respondents Michael C. Turzai and Joseph B. Scarnati, III (collectively, "Legislative Respondents") respectfully submit this Post-Trial Brief, including Proposed Findings of Fact and Conclusions of Law.

I. INTRODUCTION

After much deliberation, this nation's Founding Fathers purposefully vested state legislatures with the authority to draw Congressional districts. *See* U.S. CONST. art. I, § 4; *see also Vieth v. Jubelirer*, 541 U.S. 267, 274-77 (2004) (plurality op.); *Cooper v. Harris*, 137 S. Ct. 1455, 1487 (2007) (Alito, J., dissenting, joined by Roberts, C.J., and Kennedy, J.). They delegated this authority fully cognizant that political branches of government make political decisions. *See Vieth*, 541 U.S. at 274-77[1]; *Gaffney v. Cummings*, 412 U.S. 735, 753 (1973) ("Politics and political considerations are inseparable from districting and apportionment …. The reality is that districting inevitably has and is intended to have substantial political consequences."). Indeed, the Supreme Court of Pennsylvania, like the U.S. Supreme Court, has acknowledged that redistricting is "the most political of legislative functions …." *Erfer v. Commonwealth*, 794 A.2d

[1] But equally cognizant that excesses in this formulation could and likely would occur, the Founders vested another political branch, the U.S. Congress, with the authority to remedy any such excesses. *See id*. at 275.

325, 334 (Pa. 2002); *see also Growe v. Emison*, 507 U.S. 25, 33 (1993) (describing redistricting as a "highly political task").[2]

The highly political nature of the redistricting process has led to the U.S. Supreme Court's struggle to formulate a judicially manageable standard to evaluate partisan gerrymandering claims for over 30 years. In four separate opinions in *Davis v. Bandemer*, 478 U.S. 109 (1986), the U.S. Supreme Court attempted to articulate a manageable standard. But 20 years later in *Vieth*, a splintered U.S. Supreme Court, in five separate opinions, held that the standard described in *Bandemer* was unworkable in practice and must be rejected. Indeed, the U.S. Supreme Court in *Vieth* could not articulate a workable standard and four Justices expressly found partisan gerrymandering claims to be non-justiciable.

Two years after *Vieth*, the U.S. Supreme Court, in six separate opinions, once again could not agree upon a workable standard for partisan gerrymandering claims. *See League of United Latin Am. Citizens v. Perry* ("*LULAC*"), 548 U.S. 399 (2006). Thus, while it appeared for a time that the U.S. Supreme Court had perhaps achieved some level of agreement concerning the elements for a partisan gerrymandering claim—as articulated by the *Bandemer* plurality—the Court has since abandoned any such consensus. *See Vieth*, 541 U.S. at 283-84 (plurality op.);

[2] Pennsylvania has adopted a constitutional provision limiting its General Assembly's power in drawing state legislative districts. PA. CONST. art. II, § 16. Conversely, Pennsylvania has deliberately chosen not to limit the General Assembly's power in drawing federal Congressional districts with any constitutional or statutory restrictions.

id. at 308 (Kennedy, J., concurring); *id*. at 318 (Stevens, J., dissenting); *id*. at 346 (Souter and Ginsburg, JJ., dissenting); *id*. at 355-56 (Breyer, J., dissenting).

Of critical importance for this action, the Pennsylvania Supreme Court has repeatedly clarified that: (1) its Constitutional equal protection provisions are coterminous with the federal Constitution's Equal Protection Clause, *Erfer*, 794 A.2d at 332; and (2) it "ordinarily" and "often" follows the lead of the U.S. Supreme Court with regard to free speech and association claims. *Pap's A.M. v. City of Erie*, 812 A.2d 591, 611 (Pa. 2002). Thus, while the *Bandemer* elements comprise the cornerstone for Pennsylvania's current partisan gerrymandering jurisprudence, i.e., *Erfer*, the Pennsylvania Supreme Court has not issued an opinion regarding a partisan gerrymandering claim's viability or elements since the U.S. Supreme Court in *Vieth* placed into significant doubt whether the *Bandemer* standard is workable—and whether partisan gerrymandering cases are even justiciable. *Erfer*, 794 A.2d at 332. Thus, it remains uncertain whether *Bandemer*/*Erfer* articulation of partisan gerrymandering claims should remain the law in Pennsylvania.

But, assuming *arguendo* that the *Bandemer*-based elements articulated in *Erfer* remain the law in Pennsylvania, it is axiomatic that all such elements require satisfaction. This is critical because the *Bandemer/Erfer* test acknowledges both the legislature's primary role in mapmaking and that political considerations are

inseparable from redistricting. And, as clarified by the Pennsylvania Supreme Court, Pennsylvania has adopted a test in *Erfer* intended to prohibit only the "most egregious" forms of redistricting. 794 A.2d at 334. Accordingly, the test articulated in *Erfer* is appropriately deferential to the General Assembly, and imposes an "unquestionably ... onerous" burden on those challenging a redistricting plan. *Id*. at 333. Moreover, all duly enacted legislation in Pennsylvania, including a redistricting plan, is afforded the presumption of constitutionality. *Commonwealth v. Askew*, 907 A.2d 624, 628 (Pa. Super. Ct. 2006) (recognizing that a law is presumed to be constitutional unless it "clearly, palpably, and plainly violates the constitution," and thus the party challenging the statute bears "a heavy burden of persuasion").[3]

Petitioners, under *Erfer*, must prove the following elements to prevail on their partisan gerrymandering claims:

First, Petitioners must establish that when Pennsylvania's General Assembly crafted Act 131 of 2011 (the "2011 Plan"), the legislature intentionally discriminated "against an identifiable political group …." *Erfer*, 794 A.2d at 332. And because political classifications are perfectly acceptable and expected in the

[3] Petitioners advanced their claim under *Erfer*, including all of its elements, and promised to satisfy each of these elements at trial. (Pet. ¶¶ 94-95, 115, 117, 119-20; Petrs. Response to Leg. Resps. Prelim. Obj. at 2-3 (Sept. 7, 2017); Petrs. Br. Opp'n to Leg. Resps. App. for Stay at 21-22 (Aug. 28, 2017). But now confronted with *Erfer*'s "unquestionably ... onerous" burden, Petitioners change course and advocate for a softening of *Erfer*'s "effects test." (*See* Petrs. Elements Br. at 3-4 and n.4 (*filed* Dec. 6, 2017). Of course, if *Erfer* articulates Pennsylvania law with regard to partisan gerrymandering claims, that law must be applied in its entirety.

context of redistricting, something beyond "intent as volition or intent as awareness of the consequences" must be demonstrated to establish the requisite intent. *Whitford v. Gill*, 218 F. Supp. 3d 837, 887 (W.D. Wis. 2016) (three-judge court), *stay pending appeal*, *Gill v. Whitford*, 137 S. Ct. 2289 (U.S. 2017); *see also Gaffney*, 412 U.S. at 753 ("Politics and political considerations are inseparable from districting and apportionment."); *Vieth*, 541 U.S. at 307 (Kennedy, J., concurring) ("A determination that a gerrymander violates the law must rest on something more than the conclusion that political classifications were applied.").

Second, Petitioners must establish that there was an "actual discriminatory effect on that group." *Erfer*, 794 A.2d at 332. (citing *Bandemer*, 478 U.S. at 127). To satisfy this second element, Petitioners must prove two things. First, they must prove that the 2011 Plan "works disproportionate results at the polls." *Id.* at 333. Petitioners may satisfy this element by using actual election results or projected outcomes in future elections. *Id*. Second, Petitioners must also "adduce evidence indicating a strong indicia of lack of political power and the denial of fair representation." *Id.* (internal quotations omitted). In short, Petitioners must demonstrate that they have been "essentially … shut out of the political process." *Id.* (internal quotations omitted); *see also id*. at 334 (finding that the *Erfer* petitioners did not demonstrate that they had been shut out of the political process because it was undisputed that the Democrats had "safe seats"). Importantly, the

foregoing test is conjunctive and Petitioners must satisfy both of its sub-elements to establish actual discriminatory effect. *Id*. at 333.

Petitioners fail to satisfy *Erfer*'s onerous standard.

First, Petitioners have failed to prove that the General Assembly acted with the requisite intent. A review of the 2011 Plan's legislative history demonstrates both Democrat involvement in the 2011 Plan's drafting as well as Democrat votes in favor of the Plan's progress and enactment. Such involvement neutralizes any notion that 2011 Plan was a partisan effort to "intentionally … minimize" Democrat power, as Petitioners allege. (Pet. ¶ 94).

Following completion of the 2010 decennial census Pennsylvania learned that it would lose one Congressional seat. (JS ¶¶ 1, 4). Thereafter, beginning in May 2011 and ending on June 14, 2011, the Joint House and Senate State Government Committees held hearings at locations across Pennsylvania to hear Pennsylvanians' views concerning the impending redistricting effort. (JS ¶ 38).

The General Assembly then went through a bipartisan process to create and ultimately enact the new Congressional map. All four caucuses of the General Assembly were provided identical data to evaluate and draw their own maps. (Petrs. Ex. 178 at 49:13-50:3; *see also* Petrs. Ex. 178 at 40:17-25). And two months after the aforementioned statewide public hearings were concluded, a draft redistricting plan, Senate Bill 1249 ("SB 1249") was introduced in the

Pennsylvania Senate. (JS ¶ 39). Between September 14, 2011 and December 14, 2011, the Senate deliberated over SB 1249. (JS ¶¶ 39-50). During these three months of deliberations, maps were considered in the Senate State Government and Appropriations Committees. (JS ¶¶ 45-47).

The Senate State Government Committee generally addresses matters involving the operation of the Commonwealth and has oversight over elections and redistricting. (Petrs. Ex. 178 at 28:25-29:14). On December 7, 2011, Senator Andrew Dinniman, a Democrat member of the State Government Committee, as well as three other Democrat members of the Committee, voted SB 1249 out of that Committee. (LR Ex. 1; Petrs. Ex. 178 at 52:23-53:4, 53:9-54:4). Failing to vote SB 1249 out of the Committee at that time would have served to scuttle the legislation. (Petrs. Ex. 178 at 58:5-25).

On December 14, 2011, the Senate State Government Committee was once again required to vote whether SB 1249 should be "reported out" of that Committee. (*See* Petrs. Ex. 178 at 60:9-61:7). On this second vote, one Democrat Senator on the Committee, Tina Tartaglione, voted in favor of reporting SB 1249 out of the Committee. (Petrs. Ex. 178 at 61:8-16). Senator Tartaglione voted in favor of "reporting out" SB 1249 from the Committee to "help" Philadelphia's Democratic Congressional delegation, incumbent Democrat Congressman Bob Brady and then-incumbent Democrat Congressman Chaka Fattah. (Petrs. Ex. 178

at 62:9-63:4). Senator Tartagione's vote was pivotal to SB 1249 being voted out of the Committee; absent her vote, SB 1249 would not have been reported out of the Committee, serving to scuttle the legislation. (Petrs. Ex. 178 at 63:5-7). That same day the Pennsylvania Senate passed SB 1249.[4]

On December 14, 2011, SB 1249 was sent to the Pennsylvania House of Representatives. (JS ¶ 52). Over the next six days, the House deliberated over SB 1249, sending the legislation to its Appropriations Committee after a second reading. (JS ¶¶ 52-55). And on December 20, 2011, SB 1249 passed the House with 136 Members voting in favor. (JS ¶ 57). Thirty-six of those 136 votes were cast by Democrats. (JS ¶ 58). That 36 different Democrat Members of the House voted in favor of SB 1249 belies the notion that Republicans intentionally constructed SB 1249 to entrench their power and minimize Democrat power. And any such notion is only further undercut when it is considered that absent such Democrat votes, SB 1249 would not have passed (as 102 votes were required for passage, and only 100 Republican members voted for the legislation). (LR Ex. 5; Petrs. Ex. 179 at 107:9-23).

[4] Democrat Senator Jay Costa introduced an amendment to SB 1249 during the Senate's floor debate. Senator Costa asserted that his amendment (i.e., alternate redistricting plan) created eight districts favorable to Republicans, four districts favorable to Democrats, and six swing districts. (JS ¶ 49.) Senator Costa's amendment was defeated, (JS ¶ 49); *see also* http://www.legis.state.pa.us/cfdocs/legis/RC/Public/rc_view_action2.cfm?sess_yr=2011&sess_ind=0&rc_body=S&rc_nbr=480; *see also* (JS ¶ 48) (stipulating that the Court may consider and take judicial notice of the legislative history of Act 131, i.e., SB 1249).

Trial in this matter conclusively demonstrates that Petitioners' effort to employ indirect evidence to establish the General Assembly's intent fares no better. First, Petitioners will likely seek to rely extensively on the simulated maps of their expert, Dr. Jowei Chen ("Dr. Chen"). But actual Congressional maps are not drawn in a simulated world, and for good reason. As demonstrated at trial, Dr. Chen's simulated maps are dubious; yet he purports to divine intent through the use of his simulated maps. (*See* Trial Tr., Vol. I at 199:4-204:15). Dr. Chen readily admits that he has no expertise in the Voting Rights Act and thus he did not analyze whether any of his simulated maps comply with the Voting Rights Act—a minimum threshold standard for producing a legally valid map. (Trial Tr., Vol. II at 486:16-487:13). In fact, as explained at trial by Legislative Respondents' expert, Dr. Wendy Tam Cho ("Dr. Cho"), only 54 of Dr. Chen's simulated maps are compliant with traditional redistricting principles and are potentially compliant with the Voting Rights Act. (*See* Petrs. Ex. 15; Trial Tr., Vol. IV at 1174:21-25).

The evidence elicited at trial also conclusively demonstrated that Dr. Chen's maps were not a random statistically valid sample of all possible valid redistrictings. (Trial Tr., Vol. IV at 1133:18-22, 1135:11-14, 1137:25-1138:13, 1140:16-25, 1141:1-3, 1141:25-1142:18). Further, it established that in calculating the partisan composition of his simulated districts, Dr. Chen applied a "winner take all" approach, thereby failing entirely to account for the common result that

Democrats often win districts that lean slightly Republican. Indeed, when such an analysis was imputed to Dr. Chen's simulations, they turned out to be more favorable to Republicans than the 2011 Plan. (Trial Tr., Vol. V at 1471:15-1472:18; *see also* LR Ex. 17 at 12-13). As such, Dr. Chen's conclusion that the 2011 Plan is an outlier that cannot be explained by traditional districting criteria, and, therefore, must have been enacted to achieve a partisan advantage, is unsupportable.

The analysis of Petitioners' expert, Dr. Wesley Pegden ("Dr. Pegden") seeking to impute nefarious intent to the General Assembly fares no better. The U.S. Constitution requires that districts be drawn with equal population. *See Karcher v. Daggett*, 462 U.S. 725, 731-32 (1983). But, Dr. Pegden admitted that his algorithm is incapable of identifying maps that have a 0% population deviation (as required by the U.S. Constitution). (*See* Trial Tr., Vol. III at 770:20-771:3; *see also* Trial Tr., Vol IV at 1220:6-12; LR. Ex. 11 at 12). Therefore, Dr. Pegden did not, and cannot, utilize his algorithm to develop maps that are compliant with the U.S. Constitution's most basic requirement. (LR Ex. 11 at 11-12). Because Dr. Pegden's algorithm simply cannot draw maps to satisfy this fundamental requirement, he (and his algorithm) is left to compare apples to oranges, and his methods are wholly incapable of even beginning to divine the General Assembly's intent in creating the 2011 Plan.

Finally, evidence adduced at trial conclusively demonstrates that the so-called "efficiency gap" method employed by Petitioners' expert, Dr. Christopher Warshaw ("Dr. Warshaw"), to purportedly assess the General Assembly's intent, is wholly incapable of such an assessment. For example, even though Dr. Warshaw conceded at trial that a state's political geography can naturally affect its so-called "efficiency gap," Dr. Warshaw did not consider Pennsylvania's political geography when calculating it. (Trial Tr., Vol. III at 982:10-16; 983:8-12). Additionally, Dr. Warshaw admitted that numerous other influences, including the Voting Rights Act and competition within districts, can have a significant effect on the "efficiency gap." (Trial Tr., Vol. III at 990:25-991:10, 1005:16-23). Moreover, Dr. Warshaw conceded that the "efficiency gap" is a relatively new means of measurement that has not been proven to be durable, i.e., long lasting. (Trial Tr., Vol. III at 852:9-14, 974:25-975:5, 1016:19-23; Petrs. Ex. 40).

Indeed, Dr. Warshaw's calculated efficiency gaps for Pennsylvania themselves confirm significant fluctuations overs the last decade. (Petrs. Ex. 40; Trial Tr., Vol. III at 1000:9-1001:19). Given all of the flaws of the "efficiency gap," it surely cannot credibly be relied upon to adequately demonstrate the General Assembly's intent to generate a partisan advantage through the 2011 Plan.

Additionally, the evidence elicited at trial demonstrates that Petitioners are wholly unable to prove that the 2011 Plan has a partisan "effect" sufficient to

satisfy the "onerous" second part of *Erfer*'s test. In this regard it is undisputed that:

- No Petitioner has been prevented from registering to vote. (JS ¶ 17);
- No Petitioner has been prohibited from speaking in opposition to the views and/or actions of his/her Congressman or Congressperson since the 2011 Plan became law. (JS ¶ 20); and
- Since the 2011 Plan was enacted, no Petitioner has been told by his/her congressperson that their constituent services would be provided or denied on the basis of that Petitioner's partisan affiliation. (JS ¶ 21).

Courts confronted with similar evidence, including the Pennsylvania Supreme Court in *Erfer*, have repeatedly found such evidence sufficient to deny relief for partisan gerrymandering claims. *See Erfer*, 794 A.2d at 334 (faulting *Erfer* petitioners for not even alleging in their brief that a winning "Republican congressional candidate will entirely ignore the interests of those citizens within his district who voted for the Democratic candidate") (internal quotations omitted); *Badham v. March Fong Eu*, 694 F. Supp. 664, 670 (N.D. Cal. 1988) (three-judge court), *aff'd*, 488 U.S. 1024 (1989) (stating that the plaintiffs have not been "'shut out' of the political process" because there were no allegations that that plaintiffs could not register to vote, vote, organize, fundraise, campaign, voice their opinions on issues of public concern or would experience any other impediment to engaging in a vigorous public debate). But even setting this aside, ample additional evidence from Petitioners demonstrates that they have neither been "shut out of the political

process," nor have they been "entirely ignored" by their representatives. (*See, e.g.*, Findings of Fact ¶¶ 61-68).

Furthermore, Petitioners readily acknowledge that there are five "safe" Democrat Congressional seats in Pennsylvania. (Pet. ¶ 80; *see also* Trial Tr., Vol. III at 1022:12-15). This fact alone demonstrates conclusively that Petitioners are not entirely shut out of the political process. *See Erfer*, 794 A.2d at 334 (finding that the *Erfer* petitioners did not demonstrate that they had been shut out of the political process because it was undisputed that the Democrats had "safe seats").

Moreover, the mere fact that Republicans have won the same number of Congressional seats in the last three elections—a fact which appears to be the primary, if not the only, basis for Petitioners' challenge to the 2011 Plan—does not mean that the number of seats to be won by Republicans is pre-ordained. At trial, Legislative Respondents' expert, Dr. Nolan McCarty ("Dr. McCarty"), the chair of the political science department at Princeton University, presented empirical evidence that, notwithstanding Republicans' recent victories, Democrats have a reasonable chance of winning several of Pennsylvania's 18 Congressional districts currently held by Republicans. (*See* Trial Tr., Vol. V at 1604:1-22).

Dr. McCarty's conclusions are unsurprising. Courts have often recognized that political affiliation is mutable and shifts not only from one election to the next, but within the same election, when voters split their ticket between parties.

See Vieth, 541 U.S. at 287 and n.8 (detailing that just five days after a district court found that a gerrymander prevented Republican candidates from ever prevailing in North Carolina judicial elections, "every Republican candidate standing for the office of superior court judge was victorious at the state level"); *see also Bandemer*, 478 U.S. at 156 (O'Connor, J., concurring) ("Vote dilution analysis is far less manageable when extended to major political parties.... [because] voters can—and often do—move from one party to the other or support candidates from both parties. Consequently, the difficulty of measuring voting strength is heightened in the case of a major political party."). Following the Supreme Court's rejection of the partisan gerrymandering claim in *Bandemer*, Democrats tied Republicans in the Indiana House in 1988 and took a majority of the Indiana House in 1990 under the map they told the Supreme Court was an insurmountable obstacle.[5]

In fact, it has long been recognized that Pennsylvania voters, in particular, frequently split their tickets. *See Erfer*, 794 A.2d at 349-50 (stating that Pennsylvania voters frequently split their ticket and cross-over vote for candidates of the opposite political party). For example, in 2016, voters who cast their ballots for Donald Trump in the Presidential election also cast their ballot for a Democrat for Congress. (*See, e.g.*, JS ¶ 128). Similarly, voters cast their presidential ballot

[5] Election History for INDIANA, Polidata.org, http://www.polidata.us/books/in/pub/inehcxc1.pdf (last visited Dec. 16, 2017).

for Hillary Clinton, but then voted for a Republican for Congress. (*See, e.g.*, JS ¶ 127). Indeed, President Trump won Pennsylvania and Republican Pat Toomey was re-elected to the United States Senate, but Democrat candidates won statewide races for Attorney General, Treasurer, and Auditor General. (JS ¶ 216). In other words, at least some voters voted Republican for President and Senate while voting Democrat for statewide office. (JS ¶ 218). And in 2016 not all registered Democrats in Pennsylvania voted straight Democrat. (JS ¶ 217). What this all demonstrates is that Democrats have a real chance of winning Congressional elections under the 2011 Plan.

Finally, there is simply no constitutional right for a particular party to win any election. *See Bandemer*, 478 U.S. at 131-32; *Vieth*, 541 U.S. at 281-82; *id*. at 308 (Kennedy, J., concurring). Instead, citizens must "pull, haul, and trade to find common political ground" and elect their candidate of choice. *See Johnson v. De Grandy*, 512 U.S. 997, 1020 (1994).

Petitioners cannot satisfy the *Erfer*/*Bandemer* effects test because they have not demonstrated that the Democrats' failure to secure additional Congressional seats under the 2011 Plan was in any way predetermined or that they were "shut out of the political process." In the end, although Petitioners may be disappointed with the results of recent Congressional elections in Pennsylvania, they have failed to prove either partisan intent or partisan effect.

II. PROPOSED FINDINGS OF FACT

A. Background

1. Following the decennial nationwide census each state is responsible for drawing its Congressional districts based on how many districts the U.S. Department of Commerce assigns the state relative to the state's population. (Joint Stipulation of Facts ("JS") ¶ 1).

2. The decision to award a particular state a certain number of seats is known as apportionment. (JS ¶ 2).

3. Congressional seats were reapportioned for Pennsylvania after the 2010 Census. (JS ¶ 3).

4. As a result of 2010 apportionment, Pennsylvania lost one Congressional seat, dropping its allocation from 19 to 18 seats. (JS ¶ 4).

5. In creating the 2011 Plan, it was mathematically impossible to avoid pairing two incumbents unless one or more incumbent congressmen/women declined to seek re-election. (JS ¶ 5).

6. In Pennsylvania, the boundaries for Congressional districts are redrawn by legislative action in the form of a bill that proceeds through both chambers of the General Assembly and is then signed into law by the Governor. (JS ¶ 6).

1. Senate Bill 1249

7. On September 14, 2011, SB 1249 was introduced in the Pennsylvania Senate. (JS ¶ 39).

8. The bill's primary sponsors were Majority Floor Leader Dominic F. Pileggi, President Pro Tempore Joseph B. Scarnati, III, and Senator Charles T. McIlhenney, Jr. (JS ¶ 40).

9. On December 7, 2011, the Senate State Government Committee, which generally addresses matters involving the operation of the Commonwealth and has oversight over elections and redistricting, unanimously voted SB 1249 out of committee. (Legislative Respondents ("LR") Ex. 1; Petrs. Ex. 178 at 28:25-29:12; *see also* Petrs. Ex. 178 at 52:23-53:4, 53:9-54:4).

10. Had SB 1249 not been voted out of the Committee, SB 1249 could not have proceeded further. (Petrs. Ex. 178 at 58:5-25).

11. The Senate's first consideration of SB 1249 took place later that same day, on December 7, 2011. (JS ¶ 41).

12. The Senate's second consideration of SB 1249 took place on December 12, 2011. (JS ¶ 43).

13. SB 1249 was amended thereafter on December 14, 2011 in the Senate State Government Committee. (JS ¶ 45).

14. The Senate State Government Committee then voted once again to determine whether SB 1249 should be reported out of that committee. (Petrs. Ex. 178 at 60:9-61:7).

15. On that second vote, one Democratic Senator, Tina Tartaglione of Philadelphia, voted to report SB 1249 out of that committee. (Petrs. Ex. 178 at 61:8-16).

16. She voted in favor of SB 1249 being reported out of the committee to "help" the Democratic congressional delegation from Philadelphia—Congressman Bob Brady and then-Congressman Chaka Fattah. (Petrs. Ex. 178 at 62:9-63:4).

17. Absent her vote, SB 1249 would not have been reported out of committee because of Republican opposition, and SB 1249 could not have proceeded any further. (Petrs. Ex. 178 at 63:5-7).

18. SB 1249 was reported out as PN 1862, and was admitted into evidence as Joint Exhibit 2. (JS ¶ 45; Joint Ex. 2).

19. On December 14, 2011, SB 1249 was referred to the Senate Appropriations Committee, where it was modified and reported out as PN 1869. It was admitted into evidence at trial as Joint Exhibit 3. (JS ¶ 46; Joint Ex. 3).

20. While SB 1249 was being considered by the Senate, the Senate Democratic Caucus was drawing its own redistricting plan. (Petrs. Ex. 178 at 50:4-15).

21. All four caucuses in the Pennsylvania General Assembly—the Pennsylvania Senate Republican Caucus, the Senate Democratic Caucus, the House Republican Caucus, and the House Democratic Caucus—had access to census data provided by the United States Census Bureau as well as voter registration history and election return information provided by the Pennsylvania Department of State. (Petrs. Ex. 178 at 49:13-50:3; *see also* Petrs. Ex. 178 at 40:17-25).

22. Democratic Senator Jay Costa introduced the Senate Democratic Caucus's redistricting plan as an amendment to SB 1249 while SB 1249 was being debated on the Senate floor, claiming that the Senate Democratic Caucus plan would create 8 districts favorable to Republicans, 4 districts favorable to Democrats, and 6 swing districts. The amendment did not pass. (JS ¶ 49; Petrs. Ex. 178 at 67:3-17, 68:24-69:3).

23. The Congressional district map proposed by Senator Costa was admitted at trial as LR Ex. 19. (Trial Tr., Vol. V at 1625:20-22; LR Ex. 19).

24. On December 14, 2011, SB 1249 passed in the Senate by a vote of 26-24. (JS ¶ 50).

25. On December 14, 2011, SB 1249 was referred to the State Government Committee of the Pennsylvania House of Representatives. (JS ¶ 52).

26. On December 15, 2011, the Pennsylvania House of Representatives considered SB 1249 for the first time. (JS ¶ 53).

27. On December 19, 2011, the House of Representatives considered SB 1249 for the second time. (JS ¶ 54).

28. On December 19, 2011, SB 1249 was referred to the Appropriations Committee of the House of Representatives. (JS ¶ 55).

29. On December 20, 2011, the House of Representatives' Appropriations Committee reported out SB 1249. It was admitted into evidence at trial as Joint Ex. 4. (JS ¶ 56).

30. On December 20, 2011, SB 1249 passed in the House of Representatives by a vote of 136-61. (JS ¶ 57).

31. Thirty-six Pennsylvania House Democrats voted for SB 1249. (JS ¶ 58; Petrs. Ex. 179 at 47:10-12, 50:3-8, 106:4-107:8).

32. SB 1249 would not have passed the House without a substantial number of House Democrats voting in its favor. (Petrs. Ex. 179 at 107:9-23).

33. There was Republican opposition to SB 1249 as certain House Republicans voted against the legislation. (JS ¶ 48, which incorporates the Legislative History of SB 1249).

34. Of the 36 House Democrats who voted for SB 1249, at least 33 of the 36 (approximately 92%) represented state legislative districts that were part of at

least one of the following congressional districts under SB 1249: the 1st, 2nd, 13th, 14th, or 17th. (JS ¶ 59).

35. On December 22, 2011, the Senate signed SB 1249, after it passed in the House. Governor Tom Corbett then signed it into law. (JS ¶ 60).

36. When SB 1249 was enacted into law, it became the 2011 Plan. (JS ¶ 61).

37. It is not uncommon or unusual for the content of Pennsylvania legislation to be introduced and passed in a very short time frame. (Petrs. Ex. 179 at 113:21-114:5; *see also* Petrs. Ex. 179 at 109:15-112:9).

2. 2011 Plan

38. The 2011 Plan remains in effect today. (JS ¶ 62).

39. The 2011 Plan has been utilized for three election cycles without legal challenges by Petitioners in this case. (JS ¶ 14, 16).

40. The 2011 Plan officially establishes the boundaries of Pennsylvania's Congressional districts. (JS ¶ 63).

41. The 2011 Plan for the entire state of Pennsylvania was admitted into evidence at trial as Joint Exhibit 5. (JS ¶ 64; Joint Ex. 5).

42. True and accurate depictions of the shapes of Pennsylvania's Congressional districts were admitted into evidence at trial as Joint Exhibits 6-23. (JS ¶ 65; Joint Exs. 6-23).

43. The 2011 Plan splits 68 of Pennsylvania's 2,561 municipalities. The 2011 Plan leaves intact Pennsylvania's other 2,493 municipalities. (JS ¶ 121).

44. The 2011 Plan splits fewer counties and municipalities than the prior plan that had been in effect. (Trial Tr., Vol. II at 657-58).

3. Registration and Voting Patterns in Pennsylvania

45. By the November 2016 election, 24 Pennsylvania counties had more registered Democrats than registered Republicans, while 43 counties had more registered Republicans than registered Democrats. (JS ¶ 203).

46. From November 2012 to November 2016, percentages of registered Republicans increased in 59 of Pennsylvania's counties, while percentages of registered Republicans decreased in eight counties. (JS ¶ 204).

47. From November 2012 to November 2016, percentages of registered Democrats increased in only five of Pennsylvania's counties, while percentages of registered Democrats decreased in 62 counties. (JS ¶ 205).

48. Only 24 of Pennsylvania's 67 counties had more registered Democrats than registered Republicans at the time of the 2016 Presidential Election. And Democratic nominee Hillary Clinton won only 11 of Pennsylvania's counties in the 2016 Presidential Election. (JS ¶ 206).

49. Three counties won by President Obama in 2012 each were won by President Trump in 2016: Erie County, Northampton County, and Luzerne County. (JS ¶ 207).

50. President Trump won Erie County with 48.57 percent of the vote to 46.99 percent of the vote for Secretary Clinton. Registered Democrats outnumbered registered Republicans 51.31 percent to 35.48 percent in Erie County in November 2016. (JS ¶ 208).

51. President Trump won Northampton County with 49.98 percent of the vote to 46.18 percent of the vote for Secretary Clinton. Registered Democrats outnumbered registered Republicans 46.87 percent to 34.76 percent in Northampton County in November 2016. (JS ¶ 209).

52. President Trump won Luzerne County with 58.29 percent of the vote to 38.86 percent of the vote for Secretary Clinton. Registered Democrats outnumbered registered Republicans 52.62 percent to 36.10 percent in Luzerne County in November 2016. (JS ¶ 210).

53. President Trump's performance in Luzerne County improved by 11.42 percentage points over the 2012 Republican nominee for President, Mitt Romney, who won 46.87 percent of the vote in Luzerne County. (JS ¶ 211).

54. In November 2016, Fayette County had 57.96 percent registered Democrats. President Trump won 64.33 percent of the vote in Fayette County. (JS ¶ 212).

55. In November 2016, Greene County had 55.22 percent registered Democrats. President Trump won 68.82 percent of the vote in Greene County. (JS ¶ 213).

56. In November 2016, Cambria County had 52.25 percent registered Democrats. President Trump won 67.00 percent of the vote in Cambria County. (JS ¶ 214).

57. In November 2016, Beaver County had 52.15 percent registered Democrats. President Trump won 57.64 percent of the vote in Beaver County. (JS ¶ 215).

58. In 2016, President Trump won Pennsylvania; Republican Pat Toomey was re-elected to the United States Senate; and Democratic candidates won statewide races for Attorney General, Treasurer, and Auditor General. (JS ¶ 216).

59. In 2016, not all registered Democrats in Pennsylvania voted straight Democrat. (JS ¶ 217).

60. As recently as the 2016 elections, some Congressional districts voted for the Republican candidate for Congress but voted for Hillary Clinton for

President. Still other districts voted for the Democrat nominee for Congress but for Donald Trump for President. (JS ¶¶ 127-28).

B. Petitioners' Testimony

1. Common Findings of Fact for All Petitioners

61. No Petitioner has been prevented from voting as he or she desired. (*See, e.g.*, Trial Tr., Vol. I at 129:8-10, 150:17-20; Trial Tr., Vol. II at 684:5-8; Petrs. Ex. 163 at 8:18-9:4; Petrs. Ex. 164 at 21:22-24; Petrs. Ex. 165 at 12:21-13:5; Petrs. Ex. 166 at 8:11-15; Petrs. Ex. 167 at 15:9-21; Petrs. Ex. 168 at 10:1-4; Petrs. Ex. 169 at 8:19-21; Petrs. Ex. 170 at 21:10:17; Petrs. Ex. 171 at 9:16-18; Petrs. Ex. 172 at 13:13-23; Petrs. Ex. 174 at 8:24-9:5; Petrs. Ex. 175 at 16:17-17:3; Petrs. Ex. 173 at 9:3-4; Petrs. Ex. 176 at 15:15-19; Petrs. Ex. 177 at 21:2-5).

62. No Petitioner has been prevented from making political contributions as he or she desired. (*See, e.g.*, Trial Tr., Vol. I at 128:20-129:3, 150:25-151:3; Trial Tr., Vol. II at 684:13-16; Petrs. Ex. 163 at 10:1-8; Petrs. Ex. 164 at 20:24-21:12, 21:18-21; Petrs. Ex. 165 at 13:6-12; Petrs. Ex. 166 at 9:20-25; Petrs. Ex. 168 at 10:5-11; Petrs. Ex. 169 at 9:22-10:5; Petrs. Ex. 170 at 21:2-9; Petrs. Ex. 171 at 13:11-25; Petrs. Ex. 172 at 14:20-15:9; Petrs. Ex. 173 at 9:12-14; Petrs. Ex. 174 at 9:12-17; Petrs. Ex. 176 at 15:7-10; Petrs. Ex. 177 at 20:21-21:1).

63. No Petitioner has been prevented from campaigning for or speaking publicly in support of any political candidate as he or she desired. (*See, e.g.*¸ Trial

Tr., Vol. I at 128:20-129:3, 150:25-151:3; Trial Tr., Vol. II at 684:17-20; Petrs. Ex. 163 at 11:16-23; Petrs. Ex. 164 at 20:24-21:12, 21:18-21; Petrs. Ex. 165 at 14:3-15:5; Petrs. Ex. 166 at 11:14-17; Petrs. Ex. 167 at 16:20-25; Petrs. Ex. 168 at 10:18-25; Petrs. Ex. 169 at 11:24-12:12; Petrs. Ex. 170 at 54:5-12; Petrs. Ex. 171 at 23:13-24:3; Petrs. Ex. 172 at 18:4-13; Petrs. Ex. 174 at 9:21-10:5; Petrs. Ex. 175 at 31:7-33:17; Petrs. Ex. 176 at 15:11-14).

64. No Petitioner has been prevented by the 2011 Plan from participating in any public protest. (*See, e.g.*, Petrs. Ex. 163 at 12:16-19; Petrs. Ex. 166 at 12:3-13:14; Petrs. Ex. 168 at 11:17-20; Petrs. Ex. 169 at 13:5-8; Petrs. Ex. 172 at 21:3-8; Petrs. Ex. 174 at 10:9-11; Petrs. Ex. 175 at 37:10-38:9).

65. No Petitioner has been prevented from engaging in civic activities. (*See, e.g.*, Petrs. Ex. 163 at 13:18-22; Petrs. Ex. 165 at 16:12-22; Petrs. Ex. 168 at 11:21-23; Petrs. Ex. 171 at 32:19-33:3; Petrs. Ex. 174 at 10:24-11:3; Petrs. Ex. 175 at 37:10-38:9).

66. No Petitioner has been prevented from registering to vote. (JS ¶ 17).

67. No Petitioners have been prohibited from speaking in opposition to the views and/or actions of their congressperson since the 2011 Plan became law. (JS ¶ 20).

68. No Petitioner has been told by any Congressional office that constituent services are provided or denied on the basis of partisan affiliations since the 2011 Plan became law. (JS ¶ 21).

69. Many Petitioners' allegations of harm amount to little more than lamenting that, in their view, they cannot elect or otherwise do not have a Congressperson that represents their political views. (*See, e.g.*, Trial Tr., Vol. I at 113:8-15, 148:8-17; Trial Tr., Vol. II at 673:25-674:5, 675:22-676:8; Petrs. Ex. 164 at 27:20-28:1; Petrs. Ex. 166 at 17:7-16; Petrs. Ex. 167 at 31:15-32:2; Petrs. Ex. 168 at 20:18-22:2; Petrs. Ex. 170 at 47:4-48:10; Petrs. Ex. 171 at 41:16-42:17; Petrs. Ex. 175 at 86:9-87:14, 88:1-16, 101:6-102:6; Petrs. Ex. 176 at 30:5-31:8; Petrs. Ex. 177 at 21:10-22:1).

70. Other Petitioners' allegations of harm relate only to the political composition of Congress or of Pennsylvania's Congressional delegation as a whole. (*See, e.g.*, Trial Tr., Vol. I at 113:16-114:3; Petrs. Ex. 163 at 35:20-36:20, 40:1-15; Petrs. Ex. 165 at 24:8-26:9; Petrs. Ex. 172 at 33:11-34:8; Petrs. Ex. 173 at 34:2-13, 35:7-12; Petrs. Ex. 177 at 39:23-40:7). As Petitioner Solomon explained, his Congressman, Dwight Evans:

> represents my issues, I'll put it that way. The problem is when his voice isn't heard by the other members, my voice isn't heard . . . because of the imbalance of the number of representatives from the other party. . . . Dwight Evans attempts to represent me, but there's no pressure . . . to compromise with him or representatives of the state because of

> the imbalance in the number of representatives based on party affiliation. So Dwight Evans tries to help me, but he can't be effective unless there's an equalizing in the number of representatives that he can partner with.

(Petrs. Ex. 169 at 15:23-16:12, 21:4-14). Similarly, Petitioner Rentschler testified that if "Democratic views, as they're expressed statewide, or Democrats across the state have more representation, I think our views would be more strongly advocated for in the United States Congress. . . . Pennsylvania should be able to have a Congress that represents its voters more accurately." (Trial Tr., Vol. II at 680:4-24).

71. Indeed, some Petitioners openly acknowledged that they do not believe that they have been harmed by their congresspersons' representation or by their districts. (*See, e.g.*, Petrs. Ex. 163 at 29:21-30:4, 35:20-36:20; Petrs. Ex. 168 at 17:13-19; Petrs. Ex. 169 at 15:7-16:12; Petrs. Ex. 172 at 43:6-44:11; Petrs. Ex. 173 at 34:2-13, 37:24-38:14; Petrs. Ex. 174 at 14:15-17).

72. Finally, some Petitioners allege that they have been harmed by the 2011 Plan only to the extent that it has contributed to general political polarization. (*See, e.g.*, Petrs. Ex. 167 at 57:17-58:9; Petrs. Ex. 169 at 37:17-38:15).

73. At bottom, many Petitioners explained their preference for competitive districts. (*See, e.g.*, Trial Tr., Vol. I at 117:12-118:1, 146:4-20; Petrs. Ex. 165 at 34:17-35:10; Petrs. Ex. 173 at 34:2-5). As Petitioner Petrosky stated, "I

think a 50/50 district would be a good district. . . . 50 Democrats/50 Republicans, as close as you could be with that." (Petrs. Ex. 171 at 44:10-16).

2. Petitioner Gretchen Brandt

74. Petitioner Gretchen Brandt ("Ms. Brandt") lives in Pennsylvania's Fifth Congressional District. (Petrs. Ex. 165 at 21:19-21; *see also* Petrs. Ex. 165 at 8:22-9:10).

75. Ms. Brandt has been registered with the Democratic Party for 25 years. (Petrs. Ex. 165 at 11:7-14). She has never been registered with any other political party. (Petrs. Ex. 165 at 11:15-17).

76. Ms. Brandt has voted in every primary and general election. (Petrs. Ex. 165 at 12:7-20). Ms. Brandt has never been prohibited from participating or voting in an election. (Petrs. Ex. 165 at 12:21-13:5).

77. Nor has Ms. Brandt been prevented from making any political donations. (Petrs. Ex. 165 at 13:6-12).

78. Ms. Brandt has never been prohibited from campaigning for or speaking publicly on behalf of a political candidate. (Petrs. Ex. 165 at 14:3-15:5).

79. Nor has she been prohibited from participating in any civic activity. (Petrs. Ex. 165 at 16:12-22).

80. Apart from one instance in the past year, in which Ms. Brandt contacted her congressperson about the possible repeal of the Affordable Care Act,

Ms. Brandt has not contacted her Congressperson, because she does not believe it to be a good use of her time. (Petrs. Ex. 165 at 18:24-19:15, 41:14-42:11).

81. Ms. Brandt believes that she is harmed by Pennsylvania's 2011 Plan because she claims the district boundaries dilute her vote—specifically, that Pennsylvania's 18 Congressional districts do not "mirror … the representation among the population of the state as a whole." (Petrs. Ex. 165 at 25:15-26:9). Ms. Brandt also claims to be harmed because her Congressional district is not competitive. (Petrs. Ex. 165 at 34:17-35:10).

3. Petitioner John Capowski

82. Petitioner John Capowski ("Mr. Capowski") lives in Pennsylvania's 4th Congressional District. (Petrs. Ex. 166 at 16:9-11). Prior to enactment of Pennsylvania's 2011 Plan, Mr. Capowski lived in the 19th Congressional District. (Petrs. Ex. 166 at 16:12-15).

83. Mr. Capowski has been registered with the Democratic Party in Pennsylvania since 1998. (Petrs. Ex. 166 at 7:5-20).

84. With the possible exception of the 2013 election, Mr. Capowski has voted in every primary, general, and local election. (Petrs. Ex. 166 at 7:21-8:10). Mr. Capowski has never been prohibited by any law or government official from participating or voting in an election. (Petrs. Ex. 166 at 8:11-15).

85. Mr. Capowski has never been prohibited by any law or government official from making any political contributions. (Petrs. Ex. 166 at 9:20-25).

86. Mr. Capowski has never been prevented from campaigning on behalf of any political candidate or party. (Petrs. Ex. 166 at 11:14-17). Indeed, Mr. Capowski has campaigned for Eugene McCarthy, Bernie Sanders, and Al Gore, among others. (Petrs. Ex. 166 at 11:1-13).

87. Apart from one instance when Pennsylvania Capitol Police stopped Mr. Capowski and other protestors from marching to the Harrisburg Farm Show Complex for unknown reasons, Mr. Capowski has not otherwise been prevented from engaging in public protests or demonstrations. (Petrs. Ex. 166 at 12:3-13:14).

88. Mr. Capowski believes that he has been harmed by being represented by his current Congressperson, Republican Scott Perry, because he believes that he does not share any political or social views with Congressperson Perry, and because he does not believe he has any chance of influencing Congressperson Perry's views. (Petrs. Ex. 166 at 17:7-16).

89. Mr. Capowski alleges that he has been harmed by the shape of his Congressional district because a Democratic candidate for Congress "would have virtually no chance" of winning, "given that the district is so heavily filled with people who are registered Republicans." (Petrs. Ex. 166 at 24:9-21).

4. Petitioner Jordi Comas

90. Petitioner Jordi Comas ("Mr. Comas") lives in Pennsylvania's 10th Congressional District. (Petrs. Ex. 167 at 23:10-13; *see also* Petrs. Ex. 167 at 8:9-11).

91. Mr. Comas is registered with the Democratic Party in Pennsylvania. (Petrs. Ex. 167 at 11:2-5). He has never been registered with another political party in Pennsylvania. (Petrs. Ex. 167 at 11:22-24).

92. With the exception of one election in 2013, Mr. Comas has voted in every primary and general election since 2005. (Petrs. Ex. 167 at 14:22-15:8). Mr. Comas has never been prohibited from voting in an election. (Petrs. Ex. 167 at 15:9-21).

93. Mr. Comas has never been prevented from campaigning on behalf of any political candidate. (Petrs. Ex. 167 at 16:20-25). Indeed, Mr. Comas is very politically active—among other things, he has volunteered for the John Kerry, Chris Carney, Barack Obama, and Hillary Clinton campaigns and founded a citizens' group named the Central Susquehanna Citizens Coalition. (Petrs. Ex. 167 at 11:25-14:6).

94. Mr. Comas alleges that he has been harmed by partisan gerrymandering because it causes his Congressperson, Republican Tom Marino, to be more beholden to his party than to his constituents. (Petrs. Ex. 167 at 31:15-

32:2). Mr. Comas also believes that because of the lack of competition in his district, the only vote that matters is in the Republican primary and that he would have to switch parties to affect the outcome of elections. (Petrs. Ex. 167 at 55:17-57:16). Mr. Comas further contends that partisan gerrymandering harms him because it makes it more difficult for citizens "to come together around issues and concerns." (Petrs. Ex. 167 at 57:17-58:9).

5. Petitioner Carmen Febo San Miguel

95. Petitioner Carmen Febo San Miguel ("Dr. Febo") lives in Pennsylvania's First Congressional District. (Petrs. Ex. 163 at 14:8-15; *see also* Petrs. Ex. 163 at 6:11-16).

96. Dr. Febo has been registered with the Democratic Party since she has been able to vote in this country. (Petrs. Ex. 163 at 7:16-22).

97. Dr. Febo has never been prevented from voting. (Petrs. Ex. 163 at 8:18-9:4).

98. Dr. Febo has never been stopped by any government official or law from making any political contributions, (Petrs. Ex. 163 at 10:1-8), campaigning or speaking publicly in support of any political candidates (Petrs. Ex. 163 at 11:16-23), or participating in any community or civil organizations. (Petrs. Ex. 163 at 13:18-22). Dr. Febo has also never been prohibited from taking part in any public protests. (Petrs. Ex. 163 at 12:16-19).

99. Dr. Febo alleges that she is harmed by the 2011 Plan because she lives in a very heavily Democratic district, and that if there were a more equal distribution of voters within her district, her "vote would have and carry more weight." (Petrs. Ex. 163 at 21:10-23:24). Although Dr. Febo's Congressperson, Democrat Bob Brady, represents her political values (Petrs. Ex. 163 at 29:21-30:4), Dr. Febo believes that her vote does not have "all of the strength that I would like it to have … because of the distribution of the district" (Petrs. Ex. 163 at 30:5-9).

100. Dr. Febo made clear that she has no objection to her Congressperson Bob Brady, but rather, that her problem is with the election (or failure to elect) other Congresspersons from Pennsylvania that will advance her political agenda. (Petrs. Ex. 163 at 35:20-36:20).

6. Petitioner John Greiner

101. Petitioner John Greiner ("Mr. Greiner") lives in Pennsylvania's Third Congressional District. (Petrs. Ex. 168 at 12:3-11)..

102. Mr. Greiner has been registered with the Democratic Party since 1981; he has never been registered with any other political party. (Petrs. Ex. 168 at 8:6-17).

103. Mr. Greiner has voted in every primary and general election since 2005. (Petrs. Ex. 168 at 9:10-19). Apart from one instance in which Mr. Greiner

failed to file an absentee ballot, he has never been prevented from voting by any law or rule. (Petrs. Ex. 168 at 10:1-4).

104. Mr. Greiner has never been prevented by any law, rule, or government official from making any political contributions, (Petrs. Ex. 168 at 10:5-11), or campaigning for or speaking publicly on behalf of any political candidate (Petrs. Ex. 168 at 10:18-25). Mr. Greiner has never been prohibited from taking part in any public protests. (Petrs. Ex. 168 at 11:17-20). Nor has any law prevented him from participating in any civil activity. (Petrs. Ex. 168 at 11:21-23).

105. Mr. Greiner has never contacted his current Congressperson, Mike Kelly, or his predecessor, Kathy Dahlkemper, regarding any issues or concerns he might have had. (Petrs. Ex. 168 at 12:3-25).

106. Mr. Greiner does not believe that being represented by his current Congressperson Mike Kelly has harmed his rights as a citizen. (Petrs. Ex. 168 at 17:13-19).

107. Mr. Greiner alleges that the shape of the Third Congressional District has harmed him because it has contributed to the defeat of the Democratic candidate in 2012 and 2014, and has discouraged any Democratic challenge to Congressperson Kelly in 2016. (Petrs. Ex. 168 at 20:18-22:2). However, he does not have any knowledge or evidence that any potential Democratic candidate was

discouraged from running for Congress in his district in 2016. (Petrs. Ex. 168 at 22:3-8).

108. Mr. Greiner further believes that the 2011 Plan, which split Erie County between two Congressional districts, has harmed Erie County as a whole, because neither congressperson devotes as much attention to the needs of Erie County. (Petrs. Ex. 168 at 26:7-19; *see also* Petrs. Ex. 168 at 28:15-29:9).

7. Petitioner Lisa Isaacs

109. Petitioner Lisa Isaacs ("Ms. Isaacs") lives in Pennsylvania's Eighth Congressional District. (Petrs. Ex. 170 at 21:18-24; *see also* Petrs. Ex. 170 at 8:7-11).

110. Ms. Isaacs has been registered with the Democratic Party since 1980. (Petrs. Ex. 170 at 11:3-10).

111. Ms. Isaacs has been registered with the Democratic Party since 1980. (Petrs. Ex. 170 at 11:3-10).

112. Ms. Isaacs votes in every election. (Petrs. Ex. 170 at 16:9-11). She has never been prevented from voting. (Petrs. Ex. 170 at 21:10-17).

113. Ms. Isaacs also has never been prevented from donating to any political candidate. (Petrs. Ex. 170 at 21:2-9).

114. Ms. Isaacs's ability to express her political views through canvassing has not been curtailed in any way. (Petrs. Ex. 170 at 54:5-12).

115. Nor has her ability to contact her congressperson been curtailed in anyway. (Petrs. Ex. 170 at 54:13-20).

116. Ms. Isaacs alleges that her Congressperson, Brian Fitzpatrick, has failed to represent her because he fails to publicly communicate his positions on important issues and also votes against her personal interests. (Petrs. Ex. 170 at 47:4-48:10).

117. Ms. Isaacs also claims that she has been harmed by the 2011 Plan because her vote has been diluted and does not carry enough weight. (Petrs. Ex. 170 at 48:12-49:23).

118. Ms. Isaacs, however, characterizes her district as a swing district. (Petrs. Ex. 170 at 25:18-26:13, 28:5-15).

8. Petitioner Donald Lancaster

119. Petitioner Donald Lancaster ("Mr. Lancaster") lives in Pennsylvania's Ninth Congressional District. (Petrs. Ex. 164 at 22:11-23:12; *see also* Petrs. Ex. 164 at 8:14-20).

120. Mr. Lancaster has been registered with the Democratic Party since he was 18. (Petrs. Ex. 164 at 13:10-16).

121. Mr. Lancaster votes in every election, general and primary. (Petrs. Ex. 164 at 21:22-24).

122. Mr. Lancaster has never been prevented from donating to or campaigning for a political candidate. (Petrs. Ex. 164 at 20:24-21:12, 21:18-21).

123. Mr. Lancaster alleges that the 2011 Plan has harmed him by negating his vote "and the votes of people like myself living in areas like Indiana County, Fayette County". (Petrs. Ex. 164 at 27:20-28:1). Mr. Lancaster contends that because his district is not competitive, his Congressperson, Bill Shuster does not listen to him or other people. (Petrs. Ex. 164 at 28:10-19; *see also* Petrs. Ex. 164 at 29:12-30:8).

124. Mr. Lancaster also concedes, however, that his congressperson would likely not be more receptive even in the absence of the 2011 Plan because the district is heavily Republican, including before the 2011 redistricting. (Petrs. Ex. 164 at 33:23-34:9, 41:22-42:12).

9. Petitioner Mary Elizabeth Lawn

125. Petitioner Mary Elizabeth Lawn ("Ms. Lawn") lives in Pennsylvania's Seventh Congressional District. (Trial Tr., Vol. I at 134:23-25).

126. Ms. Lawn has been registered with the Democratic Party since she was 18. (Trial Tr., Vol. I at 135:25-136-7).

127. Ms. Lawn votes in every election, primary and general. (Trial Tr., Vol. I at 136:8-10). She has never been stopped from voting. (Trial Tr., Vol. I at 150:17-20).

128. Ms. Lawn has also never been prevented from making contributions to or campaigning on behalf any political candidate. (Trial Tr., Vol. I at 150:25-151:3).

129. Ms. Lawn alleges that the 2011 Plan has harmed her because she does not "have the opportunity … to elect a candidate of my choice.… [She] cannot elect a Democrat. And [she] also [does not] have access to the person who is elected, to the Republican. He doesn't have to be responsive to me." (Trial Tr., Vol. I at 148:8-17).

130. Ms. Lawn does not claim that she is entitled to a representative of her choice, but rather only wants "competitive elections, where each of the candidates has the opportunity to be … elected." (Trial Tr., Vol. I at 146:4-20).

131. But Ms. Lawn never challenged the constitutionality of her Congressional district under the 2002 Plan, even though she believed that district was a "safe" district for Democratic Congressman Bob Brady. (Trial Tr., Vol. I at 149:7-150:4).

10. Petitioner Mark Lichty

132. Petitioner Mark Lichty ("Mr. Lichty") lives in Pennsylvania's Seventeenth Congressional District. (*See* Petrs. Ex. 172 at 7:11-8:7). Mr. Lichty mistakenly testified at his deposition that he lived in Pennsylvania's Thirteenth Congressional District. (*See* Petrs. Ex. 172 at 7:11-8:7, 30:11-20).

133. Mr. Lichty is registered with the Democratic Party. (Petrs. Ex. 172 at 12:14-16).

134. Mr. Lichty has never been prohibited from voting for any reason. (Petrs. Ex. 172 at 13:14-23).

135. Mr. Lichty has never been stopped by any government official or law from making any political contributions. (Petrs. Ex. 172 at 14:20-15:9).

136. Mr. Lichty has never been stopped by any government official or law from campaigning or publicly speaking in support of any political candidate. (Petrs. Ex. 172 at 18:4-13).

137. Mr. Lichty has never been prevented from participating in a public protest for any reason. (Petrs. Ex. 172 at 21:3-8).

138. Mr. Lichty has contacted his Congressperson, Matt Cartwright, regarding various issues, including the climate crisis and fracking. (Petrs. Ex. 172 at 21:10-22:2). Congressperson Cartwright has been responsive to Mr. Lichty's concerns, at least with respect to issues he believes he can make progress on. (Petrs. Ex. 172 at 22:3-25:16).

139. Mr. Lichty does not claim that Congressperson Cartwright's representation has directly harmed him, but rather, he alleges that he is harmed because "legislation that is important to me just doesn't see the light of day because it's a Republican-controlled Congress." (Petrs. Ex. 172 at 33:11-22). As

Mr. Lichty explained: "[Y]ou have to look at the big picture, you have to look at the whole state and the configuration of the state. We have – in Pennsylvania we have many more registered Democrats than Republicans, and yet we have 13 Republican representatives and only five Democratic representatives." (Petrs. Ex. 172 at 33:23-34:8).

140. Mr. Lichty also claims to be harmed "because the trust in the [democratic] process is being eroded by gerrymandering." (Petrs. Ex. 172 at 35:12-13).

141. But Mr. Lichty acknowledges that the 2011 Plan and the shape of his Congressional district has not affected him directly. (Petrs. Ex. 172 at 43:6-44:11).

11. Petitioner Richard Mantell

142. Petitioner Richard Mantell ("Mr. Mantell") lives in Pennsylvania's Thirteenth Congressional District. (Petrs. Ex. 174 at 11:6-7; *see also* Petrs. Ex. 174 at 7:6-10).

143. Mr. Mantell has been registered with the Democratic Party his entire life. (Petrs. Ex. 174 at 7:19-22).

144. Mr. Mantell has never been stopped from voting for any reason. (Petrs. Ex. 174 at 8:24-9:5).

145. Nor has Mr. Mantell been stopped from making any political contributions or campaigning for or speaking publicly in support of any political

candidate by any law or government official. (Petrs. Ex. 174 at 9:12-17, 9:21-10:5).

146. Mr. Mantell has never been stopped from participating in any political protest. (Petrs. Ex. 174 at 10:9-11).

147. And Mr. Mantell has never been stopped by any law or government official from participating in any civic or community organizations. (Petrs. Ex. 174 at 10:24-11:3).

148. Mr. Mantell has not been harmed by being represented by his current Congressman, Brendan Boyle. (Petrs. Ex. 174 at 14:15-17).

149. Mr. Mantell alleges that he has been harmed by the shape of his Congressional district because he generally believes his vote has been minimized. (Petrs. Ex. 174 at 18:8-21). However, Mr. Mantell could not specifically identify how his vote was minimized or how he was not represented in Congress. (Petrs. Ex. 174 at 18:24-20:7).

12. Petitioner William Marx

150. Petitioner William Marx ("Mr. Marx") lives in Pennsylvania's Twelfth Congressional District. (Trial Tr., Vol. I at 108:5-15).

151. Mr. Marx has been registered with the Democratic Party since he was 18. (Trial Tr., Vol. I at 105:19-24).

152. Mr. Marx tries to vote in every election. (Trial Tr., Vol. I at 106:5-15, 129:4-7). He has never been prevented from voting. (Trial Tr., Vol. I at 129:8-10).

153. Nor has Mr. Marx been prevented from making any contributions to or campaigning for any political candidate. (Trial Tr., Vol. I at 128:20-129:3).

154. Mr. Marx alleges that the 2011 Plan has "taken away [his] ability to express [his] vote", because "there's no chance of a Democrat winning in this—in this district", and "the entire map of the State has really taken away any chance of having a Democratic majority Congressional delegation." (Trial Tr., Vol. I at 113:4-114:3).

155. Mr. Marx does not claim that he is entitled to a Democratic Congressperson or a Congressperson who represents his political viewpoints, but he wants "competitive districts. I want a chance to be able to put somebody in there who would represent me." (Trial Tr., Vol. I at 117:12-118:1).

13. Petitioner Robert McKinstry

156. Petitioner Robert McKinstry ("Mr. McKinstry") lives in Pennsylvania's Sixteenth Congressional District. (Petrs. Ex. 175 at 52:24-53:4; *see also* Petrs. Ex. 175 at 11:23-12:8).

157. Mr. McKinstry is registered with the Democratic Party. (Petrs. Ex. 175 at 13:12-14).

158. Mr. McKinstry has never been prohibited from voting for any reason. (Petrs. Ex. 175 at 16:17-17:3).

159. Mr. McKinstry has also never been stopped by any law or government official from campaigning for or speaking publicly on behalf of any political candidate. (Petrs. Ex. 175 at 31:7-33:17).

160. Similarly, Mr. McKinstry has never been stopped by any law or government official from participating in any protests or civic activities. (Petrs. Ex. 175 at 37:10-38:9).

161. Mr. McKinstry has made numerous donations to political candidates, including to Republican candidates. (Petrs. Ex. 175 at 21:24-26:8).

162. Mr. McKinstry claims that the shape of his Congressional district separates him from "people whom I would normally associate with," which "translates into [the] effectiveness of my vote and my ability to effectively advocate." (Petrs. Ex. 175 at 79:19-80:10).

163. Mr. McKinstry also alleges that he, along with other voters, has been harmed by the 2011 Plan because he is unable to have his political views effectively represented. (Petrs. Ex. 175 at 86:9-87:14). In particular, Mr. McKinstry claims that his congressperson is not responsive to him because he does not vote in such a way that reflects Mr. McKinstry's political views. (Petrs. Ex. 175 at 88:1-16).

164. Mr. McKinstry further claims that the shape of his Congressional district has harmed him, because it "was manufactured to keep a safe district for [Congressman] Joe Pitts," and that but for the 2011 Plan "there would have been a very good chance of having a Democrat elected." (Petrs. Ex. 175 at 101:6-102:6).

14. Petitioner Priscilla McNulty

165. Petitioner Priscilla McNulty ("Ms. McNulty") lives in Pennsylvania's Fourteenth Congressional District. (Petrs. Ex. 173 at 32:13-14; *see also* Petrs. Ex. 173 at 6:3-4).

166. Ms. McNulty has been registered with the Democratic Party since she was 21. (Petrs. Ex. 173 at 8:1-8:13).

167. For at least the past ten years, Ms. McNulty has voted in every general, primary, and local election. (Petrs. Ex. 173 at 8:19-25). She has never been prohibited from voting. (Petrs. Ex. 173 at 9:3-4).

168. Ms. McNulty has also never been prevented by any law or government official from making any political contributions. (Petrs. Ex. 173 at 9:12-14, 9:25-10:3).

169. Ms. McNulty has campaigned for several political candidates in the past, including Mayor Bill Peduto, Councilman Dan Gilman, Councilwoman Deb Gross, Councilwoman Natalia Rudiak, and President Barack Obama among others. (Petrs. Ex. 173 at 10:7-11:4).

170. Although Ms. McNulty's political views are represented by her congressperson, Ms. McNulty would prefer competitive elections for herself and "for anybody", because she believes her "Democratic positions have not been adequately represented in Congress because the way the districts are drawn, the Democrats … can't win as many elections when the districts are drawn to favor the Republicans." (Petrs. Ex. 173 at 34:2-13). In other words, Ms. McNulty believes that the real harm results from the fact that "more Democrats from other districts aren't being elected" but that she has not been personally harmed in terms of her own representation in Congress or her congressional district. (Petrs. Ex. 173 at 35:7-12, 37:24-38:14).

15. Petitioner Lorraine Petrosky

171. Petitioner Lorraine Petrosky ("Ms. Petrosky") lives in Pennsylvania's Eighteenth Congressional District. (Petrs. Ex. 171 at 39:22-23; *see also* Petrs. Ex. 171 at 6:11-12).

172. Ms. Petrosky is a registered Democrat. (Petrs. Ex. 171 at 8:17-18).

173. Ms. Petrosky votes in nearly every election. (Petrs. Ex. 171 at 9:10-15). She has never been prohibited from voting. (Petrs. Ex. 171 at 9:16-18).

174. Ms. Petrosky has never been prevented by any law or government official from making political contributions. (Petrs. Ex. 171 at 13:11-25).

175. Ms. Petrosky has a long history of campaigning for political candidates. (Petrs. Ex. 171 at 16:16-18:7). She has never been prevented by any law or government official from campaigning for or publicly supporting any political candidate. (Petrs. Ex. 171 at 23:13-24:3).

176. Ms. Petrosky does not remember any instance in which a law or government official prevented or restricted her ability to engage in any other kind of civic activity. (Petrs. Ex. 171 at 32:19-33:3).

177. Ms. Petrosky feels that her Congressional district is a safe district for her Congressman, Tim Murphy such that no one else will run against him. (Petrs. Ex. 171 at 41:16-42:17). She believes that a fair district would be one in which the proportion of Democrats and Republicans would be as close to equal as possible. (Petrs. Ex. 171 at 44:10-45:16).

16. Petitioner Thomas Rentschler

178. Petitioner Thomas Rentschler ("Mr. Rentschler") lives in Pennsylvania's Sixth Congressional District. (Trial Tr., Vol. II at 670:14-18).

179. Mr. Rentschler has been consistently registered with the Democratic Party for the past 25 years. (Trial Tr., Vol. II at 669:11-17).

180. Mr. Rentschler tries to vote in every primary and general election. (Trial Tr., Vol. II at 669:18-20). He has never been prevented from voting. (Trial Tr., Vol. II at 684:5-8).

181. Mr. Rentschler has also never been prevented from making political contributions. (Trial Tr., Vol. II at 684:13-16).

182. Nor has Mr. Rentschler been prevented from campaigning or engaging in any kind of civic activity. (Trial Tr., Vol. II at 684:17-20).

183. Mr. Rentschler alleges that the 2011 Plan has "eliminated [his] chance of getting to vote and actually elect a Democratic candidate[.]" (Trial Tr., Vol. II at 673:25-674:5). And Mr. Rentschler disagrees with his current congressperson's views on healthcare, taxation, and abortion. (Trial Tr., Vol. II at 675:22-676:8).

184. Mr. Rentschler also alleges that he has been harmed by the overall political composition of Pennsylvania's Congressional delegation, which he attributes to the 2011 Plan, because if "Democratic views, as they're expressed statewide, or Democrats across the state have more representation, I think our views would be more strongly advocated for in the United States Congress.… Pennsylvania should be able to have a Congress that represents its voters more accurately." (Trial Tr., Vol. II at 680:4-24).

185. Although Mr. Rentschler notes that the City of Reading is in a separate Congressional district from him, he fails to identify how that fact impacts him or his rights. (Trial Tr., Vol. II at 678:21-679:23).

186. Mr. Rentschler contends that the 2011 Plan "does not appear, to me, as fair. Just giving it the eyeball test, it does not seem to be a fair district or a fair Congressional districting of—of the state." (Trial Tr., Vol. II at 681:4-15).

187. Although Mr. Rentschler suggests that the 2011 Plan rendered his Congressional district less competitive, the margin of victory between incumbent Republican Jim Gerlach and Democrat Manan Trivedi in 2010 (the last Congressional election before the 2011 Plan was enacted) was identical to the margin of victory between these same two candidates in 2012. (Trial Tr., Vol. II at 686:21-688:22).

17. Petitioner Robert Smith

188. Petitioner Robert Smith ("Mr. Smith") lives in Pennsylvania's Eleventh Congressional District. (Petrs. Ex. 176 at 8:17-19; *see also* Petrs. Ex. 176 at 8:10-13).

189. Mr. Smith has been registered with the Democratic Party since he was 18 years old. (Petrs. Ex. 176 at 10:12-18).

190. Mr. Smith generally votes in every Congressional election. (Petrs. Ex. 176 at 11:10-12). He has never been prevented from voting. (*See* Petrs. Ex. 176 at 15:15-19).

191. Mr. Smith has also never been prevented from making political contributions. (Petrs. Ex. 176 at 15:7-10).

192. Nor has Mr. Smith been prevented from working on a political campaign or supporting any candidate. (Petrs. Ex. 176 at 15:11-14).

193. Mr. Smith alleges that he has been harmed because he believes that his Congressperson, Lou Barletta does not need to be responsive to his concerns. (Petrs. Ex. 176 at 23:17-24:14). Indeed, Mr. Smith strongly disagrees with and is offended by the political issues and positions that his congressperson supports. (Petrs. Ex. 176 at 30:5-31:8).

18. Petitioner James Solomon

194. Petitioner James Solomon ("Mr. Solomon") lives in Pennsylvania's Second Congressional District. (Petrs. Ex. 169 at 18:23-19:12; *see also* Petrs. Ex. 169 at 7:9-15).

195. Mr. Solomon is a registered Democrat. (Petrs. Ex. 169 at 8:9-14).

196. Mr. Solomon has never been stopped from voting by any law or rule. (Petrs. Ex. 169 at 8:19-21).

197. Mr. Solomon has never been stopped by any law or government official from making a political contribution. (Petrs. Ex. 169 at 9:22-10:5).

198. Nor has Mr. Solomon ever been stopped by any law or government official from campaigning for or speaking in support of any political candidate or party. (Petrs. Ex. 169 at 11:24-12:12).

199. And Mr. Solomon has never been prevented from participating in any protest. (Petrs. Ex. 169 at 13:5-8).

200. Mr. Solomon believes that his Congressperson, Dwight Evans represents him and has been responsive to him. (Petrs. Ex. 169 at 15:7-24). However, he contends that, "because of the imbalance of the number of representatives from the other party," his Congressperson, Dwight Evans is not being heard in Congress, and when his congressperson is not heard, Mr. Solomon's voice is also not heard. (Petrs. Ex. 169 at 15:24-16:12, 20:21-21:14).

201. Mr. Solomon alleges that he has been harmed by the 2011 Plan because "when my representative's voice is ignored, my voice is ignored, and … there is no pressure to compromise when there is an imbalance of representatives that represent this state and . . . representatives around the country that outnumber representatives that other views based on party affiliation." (Petrs. Ex. 169 at 37:17-38:15).

19. Petitioner Thomas Ulrich

202. Petitioner Thomas Ulrich ("Mr. Ulrich") lives in Pennsylvania's Fifteenth Congressional District. (Petrs. Ex. 177 at 18:13-19:24; *see also* Petrs. Ex. 177 at 9:5-13).

203. Mr. Ulrich has been registered with the Democratic Party his whole life. (Petrs. Ex. 177 at 13:14-21).

204. Mr. Ulrich has never been prevented from voting in elections. (Petrs. Ex. 177 at 21:2-5).

205. Mr. Ulrich has never been prevented from donating to political candidates. (Petrs. Ex. 177 at 20:21-21:1).

206. Although Mr. Ulrich is represented by a Republican, Congressman Charlie Dent, Mr. Ulrich believes Congressman Dent has always been open, cordial, and willing to listen to Mr. Ulrich's concerns, and he believes that Congressman Dent "does well with constituent services." (Petrs. Ex. 177 at 18:13-19:24, 20:16-20).

207. Mr. Ulrich's primary concern about his Congressional district is that it is drawn such that it discourages challengers to Congressman Dent: "He's got his ideas, but my ideas are not competitive in that district or not being heard." (Petrs. Ex. 177 at 21:10-22:1).

208. Mr. Ulrich alleges that he has been harmed by the 2011 Plan because it has made it much more difficult to elect a Democrat in his district and that it is "weighted more heavily towards a 13 [Republican] to 5 [Democrat]" result in Pennsylvania's congressional delegation. (Petrs. Ex. 177 at 39:7-41:2).

C. Legislators' Testimony

1. Senator Andrew Dinniman

209. Senator Andrew Dinniman ("Senator Dinniman") represents Chester County in the Pennsylvania Senate. (Petrs. Ex. 178 at 17:24-18:1). He serves on the Senate State Government Committee. (Petrs. Ex. 178 at 18:2-5).

Senator Dinniman served on the Senate State Government Committee in December of 2011. (Petrs. Ex. 178 at 51:16-18). And he voted in favor of SB being "reported out" of that Committee in December 7, 2011. (Findings of Fact ¶ 9).

210. Notwithstanding Senator Dinniman's service on the Senate State Government Committee, Senator Dinniman had no involvement in the drafting of SB 1249 (which became the 2011 Plan). (Petrs. Ex. 178 at 47:9-48:9).

211. And Senator Dinniman has no personal knowledge as to how any Congressional district contained within SB 1249 was constructed. (Petrs. Ex. 178 at 48:13-48:21, 71:15-18).

212. Senator Dinniman has no personal knowledge of how the loss of a Congressional seat specifically impacted the drawing of the districts contained within SB 1249 and the 2011 Plan. (*See* Petrs. Ex. 178 at 72:4-14).

213. Senator Dinniman has no personal knowledge of how the Voting Rights Act specifically impacted the drawing of the districts contained in SB 1249 and the 2011 Plan. (Petrs. Ex. 178 at 73:5-16).

214. Apart from Pennsylvania's Seventh Congressional District, which Senator Dinniman believes was drawn for the purpose of incumbency protection, Senator Dinniman has no personal knowledge of how incumbency protection specifically impacted the drawing of the districts within SB 1249 and the 2011 Plan. (*See* Petrs. Ex. 178 at 73:24-74:21).

215. Senator Dinniman voted for Senator Costa's alternative redistricting plan and amendment to SB 1249 because he believed that it split fewer precincts than SB 1249. (Petrs. Ex. 178 at 69:3-5). But Senate Dinniman does not have personal knowledge that Senator Costa's amendment and plan would have resulted in fewer split precincts than SB 1249. (Petrs. Ex. 178 at 69:16-25, 70:13-23).

216. Senator Dinniman had no involvement with the drawing of the Senate Democratic Caucus's map or plan. (Petrs. Ex. 178 at 47:5-8).

217. Senator Dinniman has never personally drawn any Congressional districts and is not an expert in drawing Congressional districts. (Petrs. Ex. 178 at 47:2-4).

218. Senator Dinniman is not familiar with the concept of traditional redistricting principles. (Petrs. Ex. 178 at 75:1-4).

2. Representative Greg Vitali

219. Representative Greg Vitali ("Representative Vitali") represents the 166th Legislative District in Pennsylvania's House of Representatives. (Petrs. Ex. 179 at 8:7-14). He has represented that district for 25 years. (Petrs. Ex. 179 at 8:15-17).

220. Pennsylvania's 166th Legislative District includes most of Haverford Township, half of Radnor Township, and a small portion of Lower Merion Township. (Petrs. Ex. 179 at 27:3-10).

221. Representative Vitali is a Democrat. (Petrs. Ex. 179 at 8:18-22).

222. Representative Vitali has no personal knowledge regarding how any Pennsylvania Congressional district was drawn or constructed as part of SB 1249 and the 2011 Plan. (Petrs. Ex. 179 at 42:7-43:5, 44:9-45:1; *see also* Petrs. Ex. 179 at 89:3-6, 90:1-19).

223. Representative Vitali does not know how the Voting Rights Act was factored in to the drawing or construction of any districts within SB 1249 and Pennsylvania's 2011 Plan. (Petrs. Ex. 179 at 90:20-23).

224. Representative Vitali does not know how shifts in Pennsylvania's population were factored in to the drawing or construction of districts within SB 1249 and Pennsylvania's 2011 Plan. (Petrs. Ex. 179 at 90:24-91:4).

225. Representative Vitali does not know how Pennsylvania's loss of a Congressional seat was factored in to the drawing or construction of districts within SB 1249 and Pennsylvania's 2011 Plan. (Petrs. Ex. 179 at 92:24-93:8).

226. Representative Vitali also does not have any personal knowledge of who participated in the drafting of SB 1249. (Petrs. Ex. 179 at 121:16-124:19).

227. Representative Vitali does not know why those 36 Democratic State Representatives voted in favor of SB 1249. (Petrs. Ex. 179 at 50:9-21; 51:11-14). Nor does Representative Vitali know why any Republican State Representative voted in favor of SB 1249. (Petrs. Ex. 179 at 51:15-20).

228. That said, Representative Vitali understands that Congressman Bob Brady, who is very influential among Philadelphia Democrats, was in favor of SB 1249 because Congressman Brady wanted a safe Democratic district. (Petrs. Ex. 179 at 47:13-48:1, 48:24-49:7).

229. Representative Vitali has not personally analyzed the compactness of any of Pennsylvania's Congressional districts. (Petrs. Ex. 179 at 83:14-23, 87:4-9). And he does not know the measure of any district's compactness. (Petrs. Ex. 179 at 84:15-24).

230. Representative Vitali has never had any training in GIS software and has never used GIS software for assessing or drawing a map. (Petrs. Ex. 179 at 88:19-89:2).

231. Representative Vitali does not believe that incumbency protection is a valid consideration in redistricting. (*See* Petrs. Ex. 179 at 102:19-103:15).

D. Petitioners' Proffered Expert Opinions Do Not Establish that the 2011 Plan Intended to, or Did in Fact Create a Partisan Bias in the 2011 Plan Causing a Discriminatory Effect on Petitioners.

1. Petitioners' Experts Do Not Establish a Partisan Bias in the 2011 Plan.

a. Dr. McCarty's Analysis of Partisan Bias in the 2011 Plan.

232. Professor Nolan McCarty, Ph.D. is the Susan Dod Brown Professor of Politics and Public Affairs and the chair of the Political Science Department at Princeton University. (Trial Tr., Vol. V at 1409:18-24).

233. The Court accepted Dr. McCarty as an expert in redistricting, quantitative election and political analysis, representation and legislative behavior. (Trial Tr., Vol. V at 1417:5-1418:2; *see also* LR Ex. 16).

234. Dr. McCarty found no evidence to demonstrate that the 2011 Plan gives Republicans a partisan advantage over Democrats. (Trial Tr., Vol. V at 1489:19-1490:1).

235. Dr. McCarty testified that elections are about more than partisanship – the entire success of one party cannot be attributed to the partisan composition of Pennsylvania's districts. (Trial Tr., Vol. V at 1594:15-24).

236. Dr. McCarty used the Partisan Voting Index ("PVI") and historical data from Congressional elections throughout the country to estimate the number

of seats each party would be expected to win under the 2011 Plan. (Trial Tr., Vol. V at 1428:1-19).

237. Dr. McCarty's methodology is generally accepted by political scientists, and is more reliable than the methodology utilized by Petitioners' expert, Dr. Jowei Chen. (Trial Tr., Vol. V at 1422:8-1423:19).

238. The PVI is based on presidential vote returns in each Congressional district. It measures partisanship of districts with regard to Congressional elections. (Trial Tr., Vol. V at 1501:7-15).

239. The PVI is calculated by comparing the presidential vote returns in the Congressional district with the national average of vote returns for the presidential election. (Trial Tr., Vol. V at 1421:14-24).

240. Under a PVI methodology, an R+2 district is a district in which a Republican presidential candidate ran two points better in that district than he or she performed nationally. Similarly, a D+3 district means the Democratic candidate for president ran three points better in that district than he or she performed nationally. (Trial Tr., Vol. V at 1424:11-19).

241. Dr. McCarty first calculated the PVI values in Pennsylvania using presidential voting data from the two presidential elections immediately preceding enactment of the 2011 Plan: 2004 and 2008. (Trial Tr., Vol. V at 1616:15-1617:7).

242. He used these two election years to calculate the PVIs because that was the information available to Pennsylvania's General Assembly at the time the 2011 Plan was created and enacted. (Trial Tr., Vol. V at 1423:20-1424:2; *see also* Trial Tr., Vol V at 1617:3-7).

243. Moreover, he utilized presidential election data as opposed to statewide election data because data from presidential elections tends to have fewer anomalies than data arising from statewide elections due to the fact that presidential elections are almost always "highly contested." (Trial Tr., Vol. V at 1423:2-19).

244. Figure 1 of Dr. McCarty's expert report details the PVIs for each Congressional district in Pennsylvania under the 2011 Plan such that Republican leaning districts are given positive values and Democrat leaning districts are given negative values. (Trial Tr., Vol. V at 1424:11-25; LR Ex. 17).

245. Figure 1 shows 11 of Pennsylvania's districts had positive Republican PVIs, 6 had negative Republican PVIs and one was zero. (Trial Tr., Vol. V at 1426:1-15; 1428:23-1429:16; *see also* Figure 1 of LR Ex. 17). Those districts with PVIs at or close to zero are more competitive than the others. (Trial Tr., Vol. V at 1427:13-19).

246. The PVI data for each district that is detailed in Figure 1 is subject to unpredictable factors such as national waves, spending on elections, the quality of

candidates in the election and outside influences. (Trial Tr., Vol. V at 1426:20-1427:3).

247. Dr. McCarty then determined the percentage chance that a candidate from one party will win a Congressional election in a district with any given PVI. (Trial Tr., Vol. V at 1428:1-11).

248. To determine such percentages, Dr. McCarty needed a broad data set. As such, he calculated the PVI for each Congressional district nationwide. (Trial Tr., Vol. V at 1428:1-19, 1430:14-1431:11).

249. He then reviewed Congressional election results from each district for the period 2004 through 2014 to determine what percentage of time a Democrat or Republican won a Congressional election in a district bearing any particular PVI score. For example, if there were 100 Congressional elections in districts with a PVI of R +3, and Republicans won those districts in 57 elections, Dr. McCarty's model predicted that Republicans would win R +3 Districts 57% of the time. The results of his analysis appear in the Appendix to his report. (Trial Tr., Vol. V at 1430:14-1431:11; LR Ex. 17 Appx).

250. Dr. McCarty's analysis revealed that districts with a relatively high PVI score were often competitive. For example, nationally, districts with a PVI of R+6 had been won by Democrats 23% of the time during the period 2004 through

2014. Similarly, Dr. McCarty determined that Democrats had won R+1 districts over that period 39.7% of the time. (LR Ex. 17 Appx).

251. This analysis afforded Dr. McCarty the information necessary to determine the probability that a district with a particular PVI in Pennsylvania would vote for one party over the other. (Trial Tr., Vol. V at 1438:16-1439:2).

252. Dr. McCarty then took these percentages and used them to calculate the estimated number of seats the Democrats would win under the Act 34 of 2002 Congressional Plan ("2002 Plan") and the 2011 Plan, as reflected in Table 1 of his report. (Trial Tr., Vol. V at 1439:7-1440:17; LR Ex. 17).

253. The probability outcomes addressing the likelihood of whether a Democrat or Republican would win a district with a given PVI are reflected in Figure 2 of Dr. McCarty's report. As detailed in Table 1, the number of seats the Democrats would be expected to win in 2002 (under the 2002 Plan) was 9.55 (i.e., between 9 and 10), while in 2012 (under the 2011 Plan), it was slightly more than 8 seats. (Trial Tr., Vol. V at 1441:14-20; LR Ex. 17 at 9).

254. Moreover, he concluded that of the 1.4 estimated seats the Democrats "lost" from the 2002 Plan to the 2011 Plan, at least 0.55 was attributable to the loss of one of Pennsylvania's congressional seats. (Trial Tr., Vol. V at 1442:4-15).

255. Further, Dr. McCarty's analysis reveals that under the 2011 Plan, ten districts are competitive in that each party has at least a 20% chance of winning. (Trial Tr., Vol. V at 1604:1-22).

256. Of the remaining eight districts, five are favorable to Democrats and only three are favorable to Republicans. (Trial Tr., Vol. V at 1443:4-1444:4).

257. Moreover, Dr. McCarty's analysis reveals that several of the Congressional seats described by Dr. Chen as Republican seats are ones that Democrats have a reasonable probability of winning. (Trial Tr., Vol. V at 1463:4-22).

258. Dr. McCarty's use of nationwide Congressional election data, rather than use of data from Pennsylvania's more limited number of Congressional elections, allowed Dr. McCarty to calculate estimates for a broad range of PVIs. (Trial Tr., Vol. V at 1431:2-11).

259. Additionally, Dr. McCarty calculated the estimated range of seats the Republicans should win under the 2011 Plan based upon the PVIs in order to further establish the variation in election outcomes. (Trial Tr., Vol. V at 1430:14-22).

260. Dr. McCarty simulated 1,000 elections using the probabilities from Table 1 to compute the range of expected number of seats the Republicans should have won under the 2011 Plan. (Trial Tr., Vol. V at 1450:5-19).

261. The distributions of these outcomes across Dr. McCarty's 1,000 simulations are shown in Figure 3 and demonstrate that Republicans could have won between 5 and 14 seats, with the most common result being 10. (Trial Tr., Vol. V at 1450:15-1451:17). In his simulations, Republicans won 13 seats only 3% of the time. (Trial Tr., Vol. V at 1451:18-1452:1). This range demonstrates that under the 2011 Plan, it is possible for Republicans to win 13 seats, however, that result should not be common given the PVI values associated with configuration of the 2011 Plan. (Trial Tr., Vol. V at 1452:3-9). In other words, Republicans were most often expected to win just 10 seats under the 2011 Plan based upon the partisan composition of the districts. (Trial Tr., Vol. V at 1453:1-3).

262. He concluded that the difference between the estimated 10 seats in his model and the 13 held by Republicans since enactment of the 2011 Plan cannot be attributable to the partisan composition of the 2011 Plan. (Trial Tr., Vol. V at 1594:21-24; LR Ex. 17 at 10).

263. Dr. McCarty concluded that the fact that Republicans have held 13 seats since enactment of the 2011 Plan indicates that they have over performed or that Democrats have underperformed relative to history. (LR Ex. 17 at 10).

264. Dr. McCarty also calculated that if the General Assembly was attempting to draw a map that would result in 13 seats for the Republicans, the

map would only achieve that outcome 3% of the time given the partisan composition of the drawn districts. (Trial Tr., Vol. V at 1452:3-1453:10).

265. Thus, Dr. McCarty concluded that the 2011 Plan was not drafted to secure 13 seats for the Republicans. (Trial Tr., Vol. V at 1518:12-23).

266. Importantly, Dr. McCarty's simulation results depicted in Figure 4 do not mean that his model was wrong 97% of the time; to read his report in such a manner is a confused approach. (Trial Tr., Vol. V at 1619:12-25, 1620:7-12). Rather, the model depicts the range of outcomes, 97% of which resulted in Republican winning seats at a number other than 13 (for which they won 3% of the time in the simulation). (LR Ex. 17 at 12).

267. For this reason, the 13 seats currently held by Republicans cannot be attributed to the partisanship of the 2011 Plan, contrary to the opinions proffered by Dr. Chen. (Trial Tr., Vol. V at 1462:3-24).

b. Dr. Chen's Simulation Approach Does Not Prove Any Partisan Bias.

268. Petitioners proffered, and the Court accepted, Dr. Chen as an expert in the fields of "legislative districting and political geography." (Trial Tr., Vol. I at 164:2-19). Petitioners presented Dr. Chen's report and testimony concerning an analysis he conducted at their request of "whether partisan intent was the predominant factor in the drawing of the enacted Act 131 Congressional Districting Plan in Pennsylvania," the effect of partisan intent as a "predominant

factor" on "the number of Congressional Democrats and Republicans elected in Pennsylvania's Congressional delegation," and the effect of the 2011 Plan "on the ability of the 18 individual Petitioners in this case to elect a Democrat or Republican Congressional candidate from their respective Congressional districts." (Trial Tr., Vol. I at 165:6-21).

269. Dr. Chen attempted to measure whether the 2011 Plan was predominantly motivated by "partisan intent" by comparing it against 1,000 computer-simulated maps he asserts were created only using "traditional districting principles," which Dr. Chen asserted consisted of population equality, contiguity, compactness, and minimizing county and municipal splits. (Trial Tr., Vol. I at 165:22-167:20).

270. Dr. Chen's simulated maps are dubious; he purports to divine intent through the use of his simulated maps. (*See* Trial Tr., Vol. I at 199:4-204:15). Petitioners' indirect evidence of intent through Dr. Chen's testimony is insufficient. (*See* Trial Tr., Vol. I at 204:8-15).

i. Dr. Chen's Algorithm

271. The degree of randomness Dr. Chen's algorithm employed to draw the simulation maps is the subject of significant dispute. On cross-examination, Dr. Chen described his model as beginning at a random census block on a map of

Pennsylvania and drawing boundaries outward from that point using an algorithm until the district maps were completed. (Trial Tr., Vol. II at 364:18-370:17).

272. He contends that each time his algorithm draws a boundary line, it compares up to ten possible moves while trying to optimize for the districting criteria he describes. (Trial Tr., Vol. II at 369:5-18). The algorithm then "picks the one that is not going to increase the number of municipal splits…and picks the most compact of those that are possible in this very localized set." (Trial Tr., Vol. II at 370:10-17). Dr. Chen emphasized that his "districting algorithm isn't just traversing different census blocks willy-nilly, because it has to pay attention to all these other traditional districting principles." (Trial Tr., Vol. II at 375:10-13).

273. Similarly, Dr. Chen claimed on cross-examination that his algorithm employed in this case was "fundamentally quite similar" to the algorithms he uses in his academic work. (Trial Tr., Vol. II at 376:3-10).

274. Petitioners later called Dr. Chen as a rebuttal witness. On rebuttal, Dr. Chen then testified that not only is the first spot chosen at random, but after that, his algorithm "picks adjoining neighboring blocks at random and attaches them to the ones that have already been chosen. So each step—each subsequent step along the way, another adjoining block is picked at random." (Trial Tr., Vol. V at 1658:3-8). The Court finds Dr. Chen's rebuttal testimony on this point to

be in tension with his prior testimony about how his algorithm functions. (*See* Findings of Fact ¶ 272).

275. Dr. Chen further admitted that, although he generated computer code in this case, he has no computer science degree and he never submitted his algorithms for validation in a technical publication. (Trial Tr., Vol. V at 1704:22-1705:12).

276. Dr. Chen testified that that his algorithm "optimized" traditional districting criteria, which purportedly enabled him to give a precise indication of the range of districting plans that were likely to emerge in the absence of partisan objectives. (Trial Tr., Vol. I at 166:18-167:20, 205:20-206:11).

277. When a number of different criteria are optimized, this is known as "multi-objective optimization." (LR Ex. 11 at 18).

278. Notably, there are many ways to perform a multi-objective optimization, and they do not all lead to the same output because the various objectives are not all optimized with every algorithmic step. (LR Ex. 11 at 18). For example, the movement of one voter tabulation district ("VTD") from one district to another district may simultaneously preserve a city but make population deviation worse. (LR Ex. 11 at 18).

279. There are a large number of such conflicts between the various districting objectives, but Dr. Chen does not describe how his algorithm would

resolve them. (LR Ex. 11 at 18). Indeed, there is no obvious way to resolve such conflicts, and information about the specific choices made in an algorithm are critical to interpreting the output produced, as well as to determining whether the algorithm achieved its stated purpose. (LR Ex. 11 at 18).

ii. Dr. Chen Fails to Consider All Proper Traditional Districting Factors Rendering His Simulations Not Comparable to the 2011 Plan.

280. Dr. Chen generated two sets of 500 maps. (Trial Tr., Vol. I at 170:16-20, 205:20-206:11).

281. The first set used the following districting criteria, which Dr. Chen contended constituted all the traditional districting criteria: equal population districts, contiguity, avoiding county and municipality splits, and compactness. (Trial Tr., Vol. I at 166:18-167:20).

282. The second set used the same criteria as the first, but added "incumbency protection" as another factor. (Trial Tr., Vol. I at 205:20-206:11, 209:1-14).

283. Dr. Chen's analysis hinges on his models controlling for the traditional districting factors. (*See* Trial Tr., Vol. I at 166:1-5).

284. However, Dr. Chen's simulation of "incumbency protection" merely ensured that no two incumbents were paired in the same district. (Trial Tr., Vol. I at 207:9-208:9).

285. In fact, Dr. Chen expressly denied that "preserving the cores of prior districts" and "avoiding contests between incumbent representatives" were legitimate state districting objectives or traditional districting principles. (Trial Tr., Vol. II at 386:3-389:15). He did so even though the Pennsylvania Supreme Court has described these very things as legitimate state districting objectives. *See Mellow v. Mitchell*, 607 A.2d 204, 207 (Pa. 1992) (quoting *Karcher v. Daggett*, 462 U.S. 725, 740 (1983)).

286. Dr. Chen conceded that his model would not have even worked if he had instructed his computer to preserve district cores. (Trial Tr., Vol. II at 389:25-390:11). He testified that had he done so, he would have ended up with a bunch of maps that looked like the current plan. (Trial Tr., Vol. II at 390:4-13).

287. Dr. Chen further conceded that he did not independently consider "communities of interest" in his simulation model, but merely treated them as being synonymous with municipal and county boundaries. (Trial Tr., Vol. II at 391:1-18).

288. Moreover, Dr. Chen never considered whether his simulated maps complied with the federal Voting Rights Act. (Trial Tr., Vol. V at 1703:21-1704:2).

289. Indeed, Dr. Chen admitted that he does not have any expertise with the Voting Rights Act and therefore could not analyze whether any of his maps satisfied the Voting Rights Act. (Trial Tr., Vol. II at 486:16-487:1-13).

290. Ultimately only 259 of Dr. Chen's 1,000 simulation created maps maintain a Congressional district with an African-American voting-age population of at least 56.8%. (Petrs. Ex. 15).

291. Of those 259, only 54 come from the second set of simulated maps that account for incumbency protection as defined (erroneously) by Dr. Chen. (Petrs. Ex. 15).

292. 54 maps is not a sufficient sample size to draw any conclusions about the 2011 Plan given the astronomical number of possible maps that can be drawn. (Trial Tr., Vol. IV at 1181:19-1182:23).

293. And nearly a quarter of these 54 maps had 11 districts with a Republican advantage. (Petrs. Ex. 15).

294. If the traditional notion of incumbency protection had been used, the number of Republican seats that result from Dr. Chen's simulations rises. (LR Ex. 11 at 24).

295. Stated differently, compliance with the Voting Rights Act and consideration of incumbency protection are both legitimate redistricting objectives. (Trial Tr., Vol. IV at 1177:11-1178:3).

296. And pursuit of incumbency protection goals may result in an increase in the number of Republican districts for reasons that have nothing to do with partisan gerrymandering. (*See* Trial Tr., Vol. I at 234:19-21 ("[I]t's just natural to expect that an effort to protect incumbents is going to favor Republicans.")).

297. Indeed, when Dr. Chen's simulated maps were controlled for both incumbency protection and Voting Right Act compliance, the simulated maps became increasingly favorable to Republicans. (Petrs. Ex. 11 Table 1).

iii. Dr. Wendy K. Tam Cho's Rebuttal of Dr. Chen's Simulation Approach.

298. Legislative **Respondents** proffered, and the Court accepted, Dr. Wendy K. Tam Cho as an expert in the fields of political science (political geography, redistricting, and American elections), operations research, statistics and probability, and high performance computing. (Trial Tr., Vol. IV at 1124:15-1125:5, 1131:21-1132:6). Dr. Cho has a Ph.D. in political science, M.A. degrees in political science and statistics, an undergraduate degree in mathematics from the University of California at Berkeley, and attended a year of law school at Cornell. (Trial Tr., Vol IV at 1113:23-1114:16).

299. Dr. Cho is a full professor at the University of Illinois at Urbana-Champaign with appointments in the departments of Political Science, Statistics, Asian-American Studies, the College of Law, and the National Center for Supercomputing Applications. (Trial Tr., Vol. IV at 1114:17-1115:2).

300. One of her research interests is the use of high-performance computing and algorithms for exploring redistricting maps. (Trial Tr., Vol. IV at 1121:20-25). She has studied redistricting, and the use of computer simulations in redistricting, for more than twenty years. (Trial Tr., Vol. IV at 1121:17-1122:25).

301. Legislative Respondents asked Dr. Cho to evaluate the expert reports and opinions of Drs. Chen and Pegden. (Trial Tr., Vol. IV at 1132:12-18).

302. Dr. Cho explained that Dr. Chen was attempting to use a computer simulation to draw a "large, random, independent sample of redistricting maps," which is essential to make claims about a specific map (i.e., the 2011 Plan) in comparison to the simulated maps. (Trial Tr., Vol. IV at 1133:8-1134:8).

303. While it is true that Dr. Cho did not review Dr. Chen's source code used to create his simulated maps, Dr. Cho was familiar with the types of algorithms Dr. Chen employed and testified that she worked with them "all the time." (Trial Tr., Vol. IV at 1134:12-20).

304. Based on Dr. Cho's review of Dr. Chen's published literature, Dr. Cho described Dr. Chen as using a "Monte Carlo" simulation, in which he chose a random geographical unit and merged additional neighboring geographical units to form a district, and then repeated that process until the number of desired districts was achieved. (Trial Tr., Vol. IV at 1134:21-1135:1, 1136:13-25, 1137:14-1138:13).

305. She found that Dr. Chen's method was deterministic, meaning that after he chooses a random starting point, the algorithm draws the rest of the map. Put differently, if Dr. Chen chose the same starting point twice, Dr. Cho would expect the method would produce the exact same final map twice. (Trial Tr., Vol. IV at 1139:7-1141:3).

306. Broadly stated, the concern is that "certain maps will never be drawn" in a deterministic model, (Trial Tr., Vol. IV at 1141:25-1142-18), and any statistical inferences drawn from a comparison to those maps "wouldn't give you the right estimate of the…partisan metric that you're interested in." (Trial Tr., Vol. IV at 1167:2-16).

307. In order to draw a random sample of possible redistricting maps like Dr. Chen *attempted* to create, one would have to develop what is known as a Markov Chain Monte Carlo ("MCMC") technique. (Trial Tr., Vol. IV at 1167:25-1168:8).

308. The problem, however, is that the method used by Dr. Chen does not have the requisite properties of MCMC. (Trial Tr., Vol. IV at 1168:25-1169:3).

309. Indeed, the MCMC technique is at this point merely theoretical, because it currently requires an infinite amount of computing time. (Trial Tr., Vol. IV at 1168:9-21).

310. Equally problematic, Dr. Cho concluded, was that Dr. Chen's algorithm had not been validated. (Trial Tr., Vol. IV at 1172:22-1173:5).

311. Dr. Cho opined that all algorithms should be validated, and that validation techniques accepted in academic settings include tests of the algorithm on smaller problems with known answers, peer review, and benchmarking. (Trial Tr., Vol. IV at 1169:4-1170:5). The basic idea of validation is to test the technique to ensure it functions properly. (*See* Trial Tr., Vol. IV at 1169:14-1170:5).

312. For example, in Dr. Cho's own research in the use of redistricting algorithms, she ran her algorithms against known data sets, benchmarked them against other algorithms, published in technical publications, and generally solicited peer review. (Trial Tr., Vol. IV, 1170:6-21, 1171:15-1172:11).

313. Thus, Dr. Chen's methodology is unsuitable to draw an independent random sample of maps to compare against the 2011 Plan. (*See* Trial Tr., Vol. IV at 1141:25-1142:19).

314. Dr. Cho also took exception with Dr. Chen's definition of the scope of traditional districting factors. Dr. Cho identified population equality, contiguity, Voting Rights Act compliance, compactness, preservation of municipalities, preservation of counties, communities of interest, incumbency protection, and preservation of district cores as all being examples of traditional districting

principles. (Trial Tr., Vol. IV, 1177:11-1178:3). As stated above, Dr. Chen took a narrower view. (Finding of Fact ¶281).

315. Dr. Cho also pointed out that Dr. Chen in running his simulations was relying upon an incomplete definition of incumbency protection. (Trial Tr., Vol. IV at 1178:18-1180:9). Incumbency protection refers to the drawing of district lines to ensure that an incumbent retains his or her core constituency, not simply omitting another incumbent in the same district. (Trial Tr., Vol. IV at 1179:18-1180-2; LR Ex. 11 at 23).

316. Moreover, neither of the two simulation sets used by Dr. Chen ensure that every simulated map is compliant with the Voting Rights Act. (LR Ex. 11 at 22-23).

317. Dr. Chen noted in his report that "the enacted Act 131 plan divided far more counties than was reasonably necessary" and that "a valid plan with only 16 or fewer counties split can be easily accomplished without difficulty and without sacrificing other non-partisan districting criteria, such as equal population." (Trial Tr., Vol. IV at 1186:5-10; LR Ex. 11 at 24).

318. But without including this necessary legal criterion, Dr. Chen does not have any basis to say that the division of additional counties would not be necessary to satisfy that criterion. (LR Ex. 11 at 24).

319. Specifically, Dr. Chen's report noted that 66 split municipalities would be "reasonably necessary." (Trial Tr., Vol. I at 229:17-230:3; Trial Tr., Vol. II at 413:3-13; LR Ex. 11 at 25-26).

320. But the 2011 Plan has only 68 split municipalities, and Dr. Chen failed to explain why the division of two additional municipalities is impermissible. (*See* Trial Tr., Vol. II at 413:14-17; Trial Tr., Vol IV, at 1189:3-1190:11; LR Ex. 11 at 26).

321. Finally, Dr. Chen does not account for Voting Rights Act compliance issues, although he appears to use a black voting age population of 56.8% as a proxy. The 54 simulation maps he produces from Set 2 (which include incumbency protection, however poorly defined) are not a sufficiently large enough sample size to draw statistical conclusions of the sort Dr. Chen wishes to draw. (Trial Tr., Vol. IV, 1180:16-1182:23).

322. Because Dr. Chen's simulated maps fail to properly account for these objectives, they cannot serve as reliable comparisons to the 2011 Plan, especially to the extent Dr. Chen relies upon those maps to prove the existence of partisan gerrymandering. (Trial Tr., Vol. IV at 1197:20-1198:4).

iv. Dr. McCarty's Analysis Shows That Dr. Chen's Simulations Are More Favorable to the Republicans.

323. Dr. McCarty's analysis also revealed that Dr. Chen's simulations overstate the advantage the 2011 Plan gives to Republicans. (Trial Tr., Vol. V at 1489:19-1490:1).

324. Dr. Chen's method of computing partisanship is quite different from that employed by Dr. McCarty. Dr. Chen computed partisanship of the districts in his simulations based solely on the "winner take all" approach. (Trial Tr., Vol. V at 1462:3-24) In other words, if a Republican candidate received a plurality of votes cast in 2010 and 2008, Dr. Chen assumed the district to be Republican for purposes of his simulations. (Trial Tr., Vol. V at 1462:15-24). By proceeding under a two-party vote system, Dr. Chen's analysis entirely ignores third-party votes. (Trial Tr., Vol. V at 1462:15-24).

325. Further, Dr. Chen's methodology does not create trustworthy predictions as it fails to take into account the competitiveness of a district and historical data showing that even Republican-leaning districts have been won by Democrats a significant percentage of the time. (Trial Tr., Vol. V at 1463:16-22).

326. Thus, Dr. McCarty imputed PVIs to Dr. Chen's simulations in order to better estimate the partisan composition of Dr. Chen's simulated districts. Dr. McCarty employed a regression analysis to predict the PVI for Dr. Chen's simulation plans. (Trial Tr., Vol. V at 1465:13-16).

327. Such regression analyses are commonly used in this field. (Trial Tr., Vol. V at 1465:17-19).

328. Using the "R^2" analysis, Dr. McCarty measured that the "goodness of fit" between his PVI measurements as against Dr. Chen's simulations was **.998** – a "very good correlation" or an "exceptionally high" one. (Trial Tr., Vol. V at 1465:20-1466:8, 1474:5-18).

329. This demonstrates that the correlation between Dr. Chen's simulations and Dr. McCarty's regression analysis was "essentially the same." (Trial Tr., Vol. V at 1507:15-19).

330. Figure 4 of Dr. McCarty's report shows the range of outcomes after imputing PVIs into Dr. Chen's simulations, resulting in as low as 4 Republican seats and as many as 16. (Trial Tr., Vol. V at 1470:19-25). The most common outcome was 11. (Trial Tr., Vol. V at 1471:1-3). The Republicans obtained 13 seats 10% of the time – a "reasonably common outcome." (Trial Tr., Vol. V at 1471:4-11).

331. In short, Dr. McCarty's analysis demonstrated that Republicans obtaining 13 seats under Dr. Chen's simulations was by no means the outlier Dr. Chen claimed. (Trial Tr., Vol. V at 1471:4-11).

332. Moreover, a comparison of Dr. McCarty's Figure 4 against his Figure 3 demonstrates that Dr. Chen's simulations are more favorable to

Republicans than the partisan composition of 2011 Plan. (Trial Tr., Vol. V at 1471:15-1472:18; *see also* LR Ex. 17 at 12-13).

333. In the end, after taking into consideration the uncertain mapping between district partisanship and Congressional election outcomes, Dr. Chen's simulations provide no evidence that the 2011 Plan is an "outlier" with respect to its alleged partisan advantages. (LR Ex. 17 at 13).

c. Dr. Wesley Pegden's Markov Chain Analysis Fails to Show Partisan Bias.

i. Dr. Pegden's Markov Chain.

334. Petitioners proffered, and the Court accepted, Dr. Pegden as an expert in the field of "probability." (Trial Tr., Vol. III at 714:3-5, 715:25-716:2). Significantly, Dr. Pegden is not a political scientist and has no degrees in political science, law, sociology, or anthropology. (Trial Tr., Vol. III at 714:18-715:8).

335. Petitioners presented Dr. Pegden's report and testimony concerning an analysis he conducted at their request of whether the 2011 Plan is an "outlier" with respect to partisan bias. (Trial Tr., Vol. III at 716:20-717:1).

336. To perform his analysis, Dr. Pegden devised a "Markov chain" that traversed Pennsylvania's space of possible redistricting plans. (Trial Tr., Vol. III at 722:9-23).

337. According to Dr. Pegden, "Markov chains are simple mathematical objects that can be used to generate random samples from a probability space by

taking a random walk on elements of the space." (Petrs. Ex. 117, Ex. B (quoting Chikina, Frieze & Pegden, *Proceedings of the National Academy of Sciences* at 2850 (2017)).

338. In Dr. Pegden's algorithm, the beginning of the Markov chain is anchored at the 2011 Plan. (Trial Tr., Vol. III at 722:9-23, 724:24-725:9).

339. The algorithm then runs that chain for up to 2^{40} (approximately 1 trillion) steps, creates different maps on the chain by swapping a boundary VTD from one district to a neighboring district, and records the maps that satisfy Dr. Pegden's criteria for a feasible map into a "bag of districtings" to compare against the 2011 Plan. (Trial Tr., Vol. III at 725:22-726:16, 731:13-20).

340. Dr. Pegden then concludes, based on his data, that the 2011 Plan is an "extreme outlier with respect to partisan bias in a way that could not be explained by the interaction of political geography and the districting criteria" that he considered. (Trial Tr., Vol. III at 717:2-8).

341. In making this claim, however, Dr. Pegden does not examine the set of all possible districting maps for Pennsylvania. (Trial Tr., Vol. III at 755:19-756:10).

342. Indeed, Dr. Pegden himself recognizes that "the number of districtings in the comparison bag can be astronomical; larger than the number of elementary particles in the known universe, for example, so we cannot simply look at them

one by one for a comparison." (Petrs. Ex.117 at n.5; *see also* Trial Tr., Vol. III at 720:19-25).

343. Significantly, Dr. Pegden concedes that his analysis cannot be used "to tell you the correct number of seats" a Republican should win, and it should not be used to draw districting maps. (Trial Tr., Vol. III at 785:17-786:1).

ii. Dr. Pegden's Analysis Fails to Consider All Traditional Districting Principles.

344. Dr. Pegden claims that his test can be used to demonstrate that a Congressional districting is gerrymandered. (*See generally* Petrs. Ex. 117). But as Dr. Pegden concedes, the composition of his "bag of districtings" that he compares against the 2011 Plan is critical to his conclusions. (Trial Tr., Vol. III at 762:24-763:16).

345. In this instance, like Dr. Chen, Dr. Pegden does not include all the relevant traditional districting criteria in his analysis. He specifically omits 0% population deviation, instead opting for 1-2%, (Petrs. Ex. 117 at 3), and also fails to account for avoiding municipality splits, preservation of district cores, and incumbency protection. (Trial Tr., Vol. III at 772:22-773:14, 780:3-781:12).

346. Here, it appears Dr. Pegden made several shortcuts in his analysis for mathematical convenience. For example, Dr. Pegden admitted that he compared the 2011 Plan (which has 0% population deviation) to plans with 2% or 1%

population deviation simply because he lacked the data to run the model with 0% deviation. (Trial Tr., Vol. III at 770:19-771:3).

347. Dr. Pegden could not provide any rigorous analysis to support his conclusion that such a comparison was fair; he simply declares it to be so. (Trial Tr., Vol. III at 769:15-770:13).

348. Similarly, Dr. Pegden admitted that he did not consider the avoidance of municipal splits in his model because it was not "immediately clear how to prioritize such splits" and "it involves some judgments that I'm reluctant to make." (Trial Tr., Vol. III at 772:22-773:14). He even extended an invitation to anyone with ideas for how to incorporate municipal splitting into his model to contact him. (Trial Tr., Vol. III at 774:23-775:4).

349. Had Dr. Pegden considered the avoidance of municipal splits in his model, for example, he would have produced a different "bag of districtings." (Trial Tr., Vol. III at 777:25-778:14).

iii. Dr. Cho's Explanation that Dr. Pegden's Approach Is Flawed.

350. Dr. Cho criticized Dr. Pegden's technique because it does not require the Markov chain to mix, which means that it does not take the necessary time to generate a representative sample of the possible redistricting maps. (Trial Tr., Vol. IV at 1199:23-1202:2; LR Ex. 11 at 5).

351. In order to generate a representative sample of all of Pennsylvania's possible maps, Dr. Pegden would have had to utilize the MCMC method, which he did not. (Trial Tr., Vol. IV at 1199:23-1202:2; LR Ex. 11 at 6).

352. In addition, the set of other possible redistrictings proposed by Dr. Pegden—which he refers to as the "bag of districtings" or "bag of alternatives"—is problematic because it does not include all of the traditional districting principles. (Trial Tr., Vol. IV at 1225:22-1227:1; LR Ex. 11 at 10).

353. As Dr. Cho explained, "if you're going to compare a map to another map, you need to employ the same criteria that—that the other map employed." (Trial Tr., Vol. IV at 1226:6-8).

354. First and foremost, even though the population deviation of the 2011 Plan is essentially 0%, Dr. Pegden does not require population equality for his set of maps, and instead uses either a 1% or 2% population deviancy. (Trial Tr., Vol. IV at 1219:4-8, 1226:22-1227:1; LR Ex. 11 at 11).

355. Dr. Pegden's choice of a 1 or 2% population deviation was driven by mathematical reasons or because it was difficult or impossible to incorporate that constraint into his model. (Trial Tr., Vol. IV at 1228:11-1229:11).

356. Dr. Cho noted Dr. Pegden's attempt to downplay the significance of his model's inability to compare the 2011 Plan to other 0% population deviation

plans, but rejects it as conjecture and points out that it is not at all obvious that the data support Dr. Pegden's conclusion. (Trial Tr., Vol. IV at 1310:20-1311:6).

357. In the end, Dr. Pegden's algorithm simply cannot preserve population equality as required by law. (Trial Tr., Vol. IV at 1220:4-12).

358. Second, Dr. Pegden's candidate map set does not preserve municipalities. (Trial Tr., Vol. III at 772:22-774:5; Trial Tr., Vol. IV at 1219:17-1220:3; LR Ex. 11 at 10).

359. And Dr. Pegden himself recognized that keeping cities together may give the false impression that a map was drawn with bias, when it was not. (Trial Tr., Vol. IV at 1219:17-21, 1227:5-17; LR Ex. 11 at 10).

360. This is significant, because the 2011 Plan preserves 97.3% of municipalities. (Trial Tr., Vol. IV at 1226:9-17; LR Ex. 11 at 10).

361. Dr. Pegden therefore lacks any basis for making the broad claim that "it is mathematically impossible for a state's political geography to inherently produce partisan bias that evaporates quickly when small random changes are made to the state's districting," (Petrs. Ex. 117 at 2), when he, himself, singled out preserving cities as "political geography" and then failed to include it in his measure of political geography. (LR Ex. 11 at 10).

362. Third, Dr. Pegden failed to include incumbency protection in the maps that comprise his "bag of alternatives." (Trial Tr., Vol. IV at 1218:21-1219:21, 1226:18-21; LR Ex. 11 at 10).

363. Given that incumbency protection is a traditional redistricting principle, and given that incumbency protection would increase the appearance of a partisan effect, Dr. Pegden's failure to include it renders his bag of alternatives an insufficient basis for comparison to the 2011 Plan. (Trial Tr., Vol. IV at 1225:19-1227:1; LR Ex. 11 at 10-11).

2. The Efficiency Gap Is Not an Accurate Measure of Partisan Bias.

a. Dr. Warshaw's Use of the Efficiency Gap.

364. Petitioners proffered Dr. Christopher Warshaw as an expert in American politics with subsets in political representation, public opinion, elections, and polarization. (Trial Tr., Vol. III at 835:1-21).

365. In particular, Petitioners requested that Dr. Warshaw analyze the degree of partisan bias in the 2011 Plan which he did through use of the so-called "efficiency gap." (Trial Tr., Vol III at 836:12-15; 852:15-853:19).

366. Dr. Warshaw admitted that he is not an expert in redistricting. (Trial Tr., Vol. III at 972:24-973:5).

367. He has no knowledge or experience in how districting plans and boundaries are drawn. (Trial Tr., Vol. III at 973:6-13).

368. Dr. Warshaw acknowledged that he is not aware of any court, legislature or independent redistricting commission that has used the "efficiency gap" to draw a congressional plan. (Trial Tr., Vol. III at 974:22-975:25).

369. Dr. Warshaw also conceded that the "efficiency gap" is a relatively new measure developed by Law Professor Eric McGhee in 2014. (Trial Tr., Vol. III at 852:9-14, 974:25-975:5).

370. The so-called "efficiency gap" purports to be a measure of the partisan advantage in the districting process. (Trial Tr., Vol. III at 833:18-19).

371. Specifically, the "efficiency gap" calculates what it calls "wasted votes," which are votes in excess of those needed to win a particular district, or, in a district that is lost, all the votes cast for the losing party in that district.[6] (Trial Tr., Vol. III at 841:6-10).

372. To calculate the efficiency gap for a particular election, the number of "wasted votes" in that election are totaled for each party. (Trial Tr., Vol. III at 841:6-8). The quotient of the total number of "wasted" Republican votes is divided by the total number of votes and subtracted from the quotient of the total number of "wasted" Democratic votes divided by the total number of votes. The resulting figure constitutes the "efficiency gap" for that particular election. (Trial Tr., Vol. III at 840:13-841:24).

[6] Legislative Respondents do not view any votes cast by any citizens legally entitled to vote to be "wasted," regardless of whether their preferred candidate wins or loses an election.

373. Thus, if a party wins 49.9 percent of the two-party vote in an election, each one of those votes is considered "wasted" for purposes of calculating the efficiency gap. (Trial Tr., Vol. III at 976:18-23).

374. Dr. Warshaw calculated the "efficiency gap" for every Congressional election in every state held between 1972 and 2016. (Petrs. Ex. 37; Trial Tr., Vol. III at 863:5-14).

375. He testified that 96% of the "efficiency gaps" for those elections over last 44 years lie between -20% and 20%. (Trial Tr., Vol. III at 865:18-20).

376. Dr. Warshaw also calculated the historical "efficiency gaps" for Pennsylvania from 1972 through 2016, and opined that Pennsylvania's 2011 Plan has resulted in a large "efficiency gap" in favor of Republicans. (Trial Tr., Vol. III at 868:12-17; Petrs. Ex. 40).

377. While Dr. Warshaw calculated an "efficiency gap" in Pennsylvania of -24% for the 2012 Congressional elections, the gap decreased to -15% for the 2014 Congressional elections, i.e., the next election cycle. (Trial Tr., Vol. III at 871:12-20).

378. Dr. Warshaw conceded that the "efficiency gap" method suffers from several flaws in terms of measuring partisan bias. Among other things, Dr. Warshaw admitted that having very competitive districts can result in a high "efficiency gap." (Trial Tr., Vol. III at 979:1-7).

379. For example, the same party winning several close elections can result in a high efficiency gap even though those districts may be very competitive. (Trial Tr., Vol. III at 979:23-980:12).

380. That is because in close elections, the losing party is "wasting" all of its votes. (Trial Tr., Vol. III at 976:18-23; 977:15-20).

381. Conversely, very uncompetitive elections can result in a low "efficiency gap." (Trial Tr., Vol. III at 981:16-23).

382. If one party wins certain elections by large margins and the other party symmetrically wins other elections also by large margins, the districts may not be competitive, but the number of "wasted" votes will be equal for both parties, resulting in a low or even zero "efficiency gap." (Trial Tr., Vol. III at 981:16-23).

383. Dr. Warshaw thus acknowledged that the "efficiency gap" does not measure competitiveness. (Trial Tr., Vol. III at 980:24-981:2).

384. Dr. Warshaw further acknowledged that partisan redistricting is not the only factor that contributes to a high so-called "efficiency gap". He conceded that a number of factors other than partisanship can influence the calculated "efficiency gap," such as political geography and the Voting Rights Act. (Trial Tr., Vol. III at 990:25-991:13).

385. Yet Dr. Warshaw's analysis curiously failed to take into consideration political geography. (Trial Tr., Vol. III at 982:10-16).

386. Indeed, Dr. Warshaw was not offered as an expert in political geography, and he admitted that he has not studied the political geography of Pennsylvania or how it might influence the "efficiency gap". (Trial Tr., Vol. III at 981:24-982:9, 983:8-12).

387. But Dr. Warshaw admits that political geography can impact the "efficiency gap." (Trial Tr., Vol. III at 983:13-21).

388. For example, Dr. Warshaw admitted that packing can occur from geography, which could naturally increase the "efficiency gap." (Trial Tr., Vol, III at 983:13-21).

389. Similarly, Dr. Warshaw acknowledged that a majority/minority district required by the Voting Rights Act can have an impact on the "efficiency gap" because majority/minority districts tend to have much higher concentrations of Democratic voters, potentially leading to additional "wasted" votes. (Trial Tr., Vol. III at 1004:12-1005:23).

390. But Dr. Warshaw conceded that he is not aware of whether any majority/minority districts were required under the 2011 Plan. (Trial Tr., Vol. III at 1004:1-4).

391. Dr. Warshaw also did not factor incumbency into his "efficiency gap" analysis. (Trial Tr., Vol. III at 1008:20-24).

392. Indeed, Dr. Warshaw's "efficiency gap" analysis did not factor in the quality of incumbents versus challengers in any particular district, despite his acknowledgment that advancing a high quality or poor quality candidate could have an impact of the number of votes. (Trial Tr., Vol. III at 1005:24-1006:17).

393. Additionally, although Dr. Warshaw opined that "efficiency gaps" are "durable," he only analyzed the durability of Pennsylvania's current "efficiency gap" over a 4-year period. (Trial Tr., Vol. III at 992:20-993:1).

394. And, he failed to account for the fact that Pennsylvania's "efficiency gaps" have seen significant changes between 2012-2016 alone, dissipating by nearly one half between 2012 and 2014. (Trial Tr., Vol. III at 1001:11-19).

395. Dr. Warshaw was also forced to concede that, outside of his report, he could not point to any studies on the durability of the "efficiency gaps" in the 2012, 2014, and 2016 election cycles. (Trial Tr., Vol. III at 990:7-16).

396. And empirical evidence from Pennsylvania suggests that Pennsylvania's "efficiency gap" is not durable. In fact, although Dr. Warshaw opined that Pennsylvania's "efficiency gap" was one of the highest in the country after the enactment of the 2002 Plan, and he admitted that Pennsylvania's "efficiency gap" favored Democrats as recently as 2008. (Trial Tr., Vol. III at 1016:19-23; Petrs. Ex. 40).

397. In addition, Dr. Warshaw recognized that between 2008 and 2010, *before* the 2011 Plan was enacted, Pennsylvania's "efficiency gap" moved 10 percent in favor of Republicans. (Trial Tr., Vol. III at 996:4-10; Petrs. Ex. 40).

398. He pointed to this as an example of where Republicans won a number of close elections in 2010, causing a large change in the "efficiency gap." (Trial Tr., Vol. III at 996:11-18).

b. Dr. McCarty's Rejection of the Efficiency Gap as a Useful Measure of Partisan Bias.

399. Dr. McCarty rejected the use of the so-called "efficiency gap" as a good measure of partisan bias. (Trial Tr., Vol. V at 1489:10-17).

400. First, because there are so many conflating factors that make the "efficiency gap" grow or shrink "in the presence of or in the absence of" partisan redistricting, it is not a durable measure to determine whether a particular redistricting plan was a partisan gerrymander. (Trial Tr., Vol. V at 1483:18-25).

401. These conflating factors include the geographic concentration of voters, incumbents, or uncontested candidates. (Trial Tr., Vol. V at 1483:25-1484:8).

402. Dr. McCarty stated that Dr. Warshaw did not account for these other factors; his opinions on the "efficiency gap" in Pennsylvania self-establish that the standard is not durable. (Trial Tr., Vol. V at 1484:14-24).

403. To this end, Dr. McCarty found that Dr. Warshaw's figures in his report support the conclusion that the "efficiency gap" varies across states for reasons having nothing to do with partisan gerrymandering. (Trial Tr., Vol. V at 1485:9-22; LR Ex. 17 at 18). The measure moves as much in between redistricting efforts as it does following the implementation of a new plan. (LR Ex. 17 at 18).

404. Additionally, Dr. McCarty found that Dr. Warshaw's analysis supporting the "efficiency gap's" durability is not sound because Dr. Warshaw's analysis relied on only two election outcomes from 2012 and 2014. (Trial Tr., Vol. V at 1486:17-1487:16).

405. Reliance upon only two cycles is simply not a reliable method to assess the characteristics of a districting plan given the tendency of the gap to swing "wildly" between elections. (Trial Tr., Vol. V at 1487:1-4). Indeed, there are several reasons why the gap can remain stable for a short amount of time but then cause the gap to largely change over longer periods of time. (Trial Tr., Vol. V at 1487:1-4).

406. Thus, a more reliable assessment of durability would be to assess the so-called "efficiency gap" over five elections under a plan. (Trial Tr., Vol. V at 1487:11-16).

407. With particular regard to Pennsylvania, the "gap" can swing dramatically depending on which way a competitive district votes. (Trial Tr., Vol. V at 1488:15-1489:9).

408. Indeed, if Democrats had performed under the 2011 Plan up to expectations, the number of "wasted votes" would be significantly different and the overall so-called "efficiency gap" would be much lower. (LR Ex. 17 at 18).

409. For these reasons, the "efficiency gap" is an impractical tool to determine whether a redistricting plan advantages one political party over another. (Trial Tr., Vol. V at 1489:10-17). While it is a rough measure of "wasted votes," there are a lot of other components to "wasted votes" that are not related to partisan redistricting. (Trial Tr., Vol. V at 1489:10-17).

3. The 2011 Plan Does Not Negatively Impact Pennsylvania's Communities of Interest.

410. Petitioners proffered Dr. John J. Kennedy ("Dr. Kennedy") as an expert in American politics with subsets in political geography and the political history of Pennsylvania. (Trial Tr., Vol. II at 578:19-22).

411. More specifically, Dr. Kennedy examined how the 2011 Plan impacted communities of interest and whether any "anomalies" are present, and, if so, whether the Plan placed partisan considerations over nonpartisan considerations. (Trial Tr., Vol. II at 578:10-17).

412. Dr. Kennedy is not a map-maker, has not written any articles on redistricting, and considers himself an expert only in "looking at Pennsylvania's communities of interest." (Trial Tr., Vol. II at 646:23-647:13).

413. He was not offered as an expert in redistricting. (Trial Tr., Vol. II at 578:19-22).

414. Dr. Kennedy did not analyze whether partisan intent played any role in creating the 2011 Plan. (Trial Tr., Vol. II at 646:16-18).

415. Yet Dr. Kennedy concluded that the 2011 Plan "negatively impacts" communities of interest, "contains more anomalies than ever before," and disfavors Democrats overall. (Trial Tr., Vol. II at 579:18-21).

416. But in reaching his conclusion regarding Democrats being disfavored, Dr. Kennedy relied only on the partisan makeup of districts based on the 2010 Senate vote. He did not analyze any voting results since the enactment of the 2011 Plan. (Trial Tr., Vol. II at 649:9-13).

417. And he is not an expert in analyzing elections results. He was only qualified as an expert in political geography and the political history of Pennsylvania. (Trial Tr., Vol. II at 578:19-22).

418. Indeed, Dr. Kennedy did not prepare the maps containing the partisan breakdown of each district that he viewed; they were prepared by another expert. (Trial Tr., Vol. II at 594:17-19, 609:10-14).

419. Equal population in Congressional districts is one of the first factors and criteria considered in drawing a districting map. (Trial Tr., Vol. II at 648:4-8).

420. But Dr. Kennedy conceded that he had no idea of the criteria applicable to the equal population requirement. (Trial Tr., Vol. II at 648:9-13). For example, he was unaware that a deviation of 19 people would not comply with the equal population requirement. (Trial Tr., Vol. II at 648:14-17).

421. Dr. Kennedy also agreed that avoidance of county and municipal splits is a valid redistricting goal. (Trial Tr., Vol. II at 658:15-19).

422. And he acknowledged that split counties or municipalities are not necessarily indicative of split communities of interest. (Trial Tr., Vol. II at 639:19-25).

423. Notwithstanding his expertise in Pennsylvania's communities of interest, at trial Dr. Kennedy was forced to concede that he erred when he opined in his report that the 2011 Plan splits more counties and municipalities than the prior plan. (Petrs. Ex. 53 at 4, 16; *see also* Petrs. Ex. 56; Trial Tr., Vol. II at 655:9-658:14).

424. He admitted that in rendering his errant opinion concerning splits, he improperly compared the 2011 Plan and Act 1 of 2002, the original Congressional Plan formed following the 2000 Census that was found unconstitutional and was repealed effective April 17, 2002. (Trial Tr., Vol. II at 658:6-14).

425. Dr. Kennedy acknowledged that Act 34 of 2002, which enacted the revised 2002 Plan, and that was in effect during the 2004, 2006, 2008, and 2010 congressional elections, had more county splits than the 2011 Plan. (Trial Tr., Vol. II at 655:9-13).

426. He also acknowledged that the 2002 Plan split more municipalities than the 2011 Plan. (Trial Tr., Vol. II at 657:16-19).

427. Moreover, Dr. Kennedy admitted that population imbalances may require one to split more counties and municipalities. (Trial Tr., Vol. II at 653:5-10).

428. Separately, although Dr. Kennedy had numerous complaints with the boundaries of certain Congressional districts, he often recognized plausible, non-partisan reasons for the boundaries. For example, while Dr. Kennedy complained about the splitting of Erie County into the Third and Fifth Congressional Districts, he acknowledged that the 2011 Plan kept the City of Erie whole, and kept whole five other counties that were split in the prior plan (notably Armstrong, Butler, Mercer, Venango and Warren). (Trial Tr., Vol. II at 661:3-25).

429. Similarly, while Dr. Kennedy complains that the City of Reading was "cracked" into different districts, he admitted that the 2011 Plan kept the City of Reading whole when the prior Congressional map split Reading a number of times. (Trial Tr., Vol. II at 618:10-619:15, 662:1-4).

430. Additionally, Dr. Kennedy admitted there is "natural clustering" of Democrats and Republicans in Pennsylvania. For instance, there is natural clustering of Democrats in Pittsburgh and Philadelphia. He acknowledged that this natural clustering has nothing to do with how the Congressional boundary lines are drawn, but is attributable to natural political geography. (Trial Tr., Vol. II at 665:18-666:6).

431. Dr. Kennedy admitted that Pennsylvania experienced population loss between the 2000 and the 2010 Census, mainly in the western part of the state. (Trial Tr., Vol. II at 660:2-13).

432. And he acknowledged that based on that population loss, a Congressperson was going to lose his or her seat. (Trial Tr., Vol. II at 663:4-11).

433. Dr. Kennedy admitted that when certain "imbalances" in population occur among Congressional districts, it may be necessary to split counties or municipalities in order to get to equal population. (Trial Tr., Vol. II at 652:23-653:10).

434. Dr. Kennedy admitted that the 2011 Plan needed to pair at least two incumbents unless a representative decided not to run again. (Trial Tr., Vol. II at 663:8-11).

4. Gerrymandering Does Not Cause or Exacerbate Polarization in Congress.

435. Dr. McCarty defined polarization as the measure of the level of disagreement between members of opposing political parties. (Trial Tr., Vol. V at 1477:6-11).

436. There is an academic consensus in political science literature that gerrymandering does not have any causal effect on the levels of polarization in our legislatures. (Trial Tr., Vol. V at 1477:16-19, 1478:1-7, 1624:11-14; LR Ex. 17 at 13).

437. Dr. McCarty testified that the notion that gerrymandering "exacerbates" polarization, as espoused by Dr. Warshaw, is not compelling because there has been little evidence to show that gerrymandering is a cause of polarization. (Trial Tr. at 1478:10-22; LR Ex. 17 at 13-14).

438. Dr. Warshaw examined the roll call votes of members of Congress from the early 1970s through 2016 using a "DW-NOMINATE" score, which summarizes a representative's ideology based on all other roll call votes. (Trial Tr., Vol. III at 904:20-905:6).

439. Using this score, Dr. Warshaw opined that the most recent Congresses have the most polarization. (Trial Tr., Vol. III at 916:19-21, 925:23-25).

440. Dr. Warshaw opined that, as a result, voters of the losing party are unlikely to see their preferences enacted by their representative. (Trial Tr., Vol., III at 933:14-22).

441. But Dr. Warshaw admitted that neither gerrymandering nor a high "efficiency gap" causes polarization. (Trial Tr., Vol. III at 1017:24-1018:5).

442. Dr. Warshaw's unsupported theory that gerrymandering exacerbates polarization, i.e., that Democratic voters are worse represented in Republican districts because of gerrymandering, is directly undermined by Dr. McCarty's independent analysis using the measure employed by Dr. Warshaw – the "DW Nominate" measure of conservativeness which is based on each House member's voting records (and which Dr. McCarty helped develop in the '90s). (Trial Tr., Vol. V at 1479:1-16, 1480:7-12; LR Ex. 17 at 14-15, Figure 5).

443. Dr. McCarty's Figure 5 plots the district Republican PVIs against the 2004-2014 DW-Nominate scores. (LR Ex. 17 at 14-15).

444. This analysis demonstrates that as districts become more competitive (with PVI values between +6 and -6), the difference in views between the two parties becomes much smaller. (Trial Tr., Vol. V at 1481:11-24).

445. This suggests that Democrats residing in slightly Republican districts benefit in two ways: (1) their Republican Congressperson tends to be more moderate than they are in other districts; and, (2) districts in the middle range of

PVI values, the competitive range, are often won by members of both parties. (Trial Tr., Vol. V at 1481:9-1482:14).

446. For these reasons, Democrats and Republicans who represent competitive districts (of which there at 10 in Pennsylvania) tend to be more moderate. (Trial Tr., Vol. V at 1482:1-20; LR Ex. 17 at 16-17).

447. Consequently, Dr. McCarty concluded that there is no validity to the theory that gerrymandering exacerbates the "disconnection" between voters and their congressperson. (LR Ex. 17 at 17).

448. Dr. Warshaw admitted that, since enactment of the 2011 Plan, there have consistently been five Pennsylvania Democratic Congressional representatives. (JS ¶ 100; Trial Tr., Vol. III at 1019:24-1020:2).

449. Dr. Warshaw did not evaluate whether the interests of Democratic voters in one Pennsylvania Congressional district differ from those in another Congressional district. (Trial Tr., Vol. III at 1024:8-13).

450. But he recognized that Democratic voters in districts represented by a Republican still have their voice in Congress through the Democratic representatives of other Pennsylvania districts. (Trial Tr., Vol. III at 1025:10-13).

451. According to Dr. Warshaw, all Republican voters in districts represented by a Democratic representative to Congress have their votes wasted

and will likewise not have their interests represented in Congress. (Trial Tr., Vol. III at 1021:1-10).

452. Dr. Warshaw did not opine regarding whether any particular Petitioner in this case was impacted by the 2011 Plan. (Trial Tr., Vol. III at 1028:13-17).

III. CONCLUSIONS OF LAW

A. Petitioners' Claims Are Not Justiciable

453. Assuming Petitioners can state a claim for an unconstitutional partisan gerrymander, their claim is governed by the standard set forth in *Erfer*, 794 A.2d at 332. But since *Erfer* was decided, the United States Supreme Court has abandoned the doctrinal foundation upon which *Erfer* was based—the plurality decision in *Davis v. Bandemer*, 478 U.S. 109 (1986).

454. In *Bandemer*, a plurality of the U.S. Supreme Court recognized the justiciability of a partisan gerrymandering claim for the first time. 478 U.S. at 143. But a majority of the Court could not agree on any judicially manageable standard to apply. *Id*. at 127-37; *id*. at 161-62 (Powell, J., concurring in part and dissenting in part).

455. Moreover, a majority of the *Bandemer* Court held that the plurality's standard was not judicially manageable. *See id*. at 155 (O'Connor, and Rehnquist, JJ., and Burger, C.J., concurring in part and dissenting in part) (stating that the

plurality's test will either become unmanageable or require some form of proportional representation); *id*. at 171 (Powell, J., and Stevens, J., concurring in part and dissenting in part) (stating that the plurality's standard fails "to enunciate any standard that affords guidance to legislatures and courts."); *see also Vieth v. Jubelirer*, 541 U.S. 267, 278-279 (2004) (plurality op.) (stating that *Bandemer* did not produce a majority opinion in support of any standard, as four Justices agreed to one standard while two others thought it was something else, creating confusion in the district courts).

456. Since at least the 1960s, the Pennsylvania Supreme Court has tracked United States Supreme Court precedent in the area of redistricting. *See Erfer*, 794 A.2d at 331 (citing *Newbold v. Osser*, 425 Pa. 478, 230 A.2d 54 (1967)).

457. Adhering to that decades-long practice, the Pennsylvania Supreme Court adopted *Bandemer* and likewise held for the first time that partisan gerrymandering claims were justiciable in *In re 1991 Pennsylvania Legislative Reapportionment Comm'n*, 530 Pa. 535, 609 A.2d 132, 142 (1992), *abrogated by Holt v. 2011 Legislative Reapportionment Comm'n*, 614 Pa. 364, 38 A.3d 711 (2012).

458. In 2002 in *Erfer*, the Pennsylvania Supreme Court held that it continued to follow *Bandemer*. 794 A.2d at 332. But the Court recognized the significant judicial manageability concerns inherent in *Bandemer*:

> While we continue to adhere to the view that the disposition of political gerrymandering claims should be controlled by the *Bandemer* plurality, we are also fully cognizant of the fact the plurality's opinion has bedeviled both commentators and courts, obscuring via its labyrinthian twists and turns of logic the precise nature of the standard to be employed. *Id.*

459. Just two years later in *Vieth*, the U.S. Supreme Court abandoned *Bandemer*'s holding, and the plurality reversed course on the justiciability of a partisan gerrymandering claim. *See Vieth*, 541 U.S. at 283-84 (2004) (plurality op.); *id*. at 308 (Kennedy, J., concurring); *id*. at 318 (Stevens, J., dissenting); *id*. at 346 (Souter and Ginsburg, JJ., dissenting); *id*. at 355-56 (Breyer, J., dissenting).

460. The plurality in *Vieth* noted that the *Bandemer* plurality's test provided nothing more than "one long record of puzzlement and consternation," *id*. at 282, and that "eighteen years of essentially pointless litigation have persuaded us that *Bandemer* is incapable of principled application." *Id*. at 306.

461. In the end, in the 30 years since *Bandemer* was decided, the United States Supreme Court has been unable to conclusively determine whether partisan gerrymandering claims, in any form, are justiciable. *See Bandemer*, 478 U.S. at 127-37 (plurality op.); *id*. at 161-62 (Powell, J., concurring in part and dissenting in part); *Vieth*, 541 U.S. at 292 (plurality op.) (noting that four dissenters proposed three different standards); *see League of United Latin Am. Citizens v. Perry* ("*LULAC*"), 548 U.S. 399, 414 (2006) (Kennedy, J., concurring) (acknowledging disagreement still persists in articulating the standard to evaluate partisan

gerrymandering claims, but declining to address the justiciability issue); *see also id*. at 471-72 (Stevens, J., and Breyer, J., concurring in part and dissenting in part) (stating that plaintiffs proved partisan gerrymandering under proposed test).

462. In *Vieth*, the U.S. Supreme Court produced five splintered opinions that articulated several different standards in an attempt to determine an equal protection violation due to partisan gerrymandering. *Vieth*, 541 U.S. at 292 (noting that the four dissenters proposed three different standards to determine a partisan gerrymandering claim that were different from the two proposed standards in *Bandemer* and the one proposed by the *Vieth* appellants).

463. The lower federal courts have fared no better. *See, e.g.*, *Raleigh Wake Citizens Ass'n v. Wake Cnty. Bd. of Elections*, 827 F.3d 333, 348 (4th Cir. 2016) ("We recognize that the Supreme Court has not yet clarified when exactly partisan considerations cross the line from legitimate to unlawful."); *Shapiro v. McManus*, 203 F. Supp. 3d 579, 594 (D. Md. 2016) (three-judge court) ("[T]he combined effect of *Bandemer*, *Vieth*, and *LULAC* is that, while political gerrymandering claims premised on the Equal Protection Clause remain justiciable in theory, it is presently unclear whether an adequate standard to assess such claims will emerge."); *Pearson v. Koster*, 359 S.W.3d 35, 42 (Mo. 2012) (rejecting partisan gerrymandering claim in part because of the "Supreme Court's inability to state a clear standard . . . ."); *Radogno v. Ill. State Bd. of Elections*, No. 11-4884, 2011

U.S. Dist. LEXIS 122053, *14 and 18 (N.D. Ill. Oct. 21, 2011) (three-judge court) (stating that after *Vieth* and *LULAC* the justiciability question is still "unanswered" and further stating that because the U.S. Supreme Court has not adopted a test, trying to find one may be an "exercise in futility"); *Ala. Legislative Black Caucus v. Alabama*, 988 F. Supp. 2d 1285, 1296 (M.D. Ala. 2013) ("The Black Caucus plaintiffs conceded at the hearing on the pending motions that the standard of adjudication for their claim of partisan gerrymandering is 'unknowable.'") (three-judge court); *Lulac of Texas v. Texas Democratic Party*, 651 F. Supp. 2d 700, 712 (W.D. Tex. 2009) (three-judge court) (noting that *Vieth* held that partisan gerrymandering claims are non-justiciable); *Meza v. Galvin*, 322 F. Supp. 2d 52, 58 (D. Mass. 2004) (three-judge court) (noting that *Vieth* held "that political gerrymandering cases are nonjusticiable").

464. The matter of *Whitford v. Gill* stands as the only situation where a court has found a partisan gerrymandering claim to be justiciable and proven, and implementation of that Court's ruling has been stayed by the U.S. Supreme Court. 218 F. Supp. 3d 837 (W.D. Wisc. 2016) (three-judge court), stayed by *Gill v. Whitford*, 137 S. Ct. 2289 (2017).

465. Petitioners rely upon the same partisan intent/effect framework developed in *Bandemer*, and adopted by the Supreme Court of Pennsylvania in *1991 Reapportionment*, and again in *Erfer*.

466. But the Pennsylvania Supreme Court has not been afforded an opportunity to review its partisan gerrymandering jurisprudence since the *Vieth* plurality held that partisan gerrymandering claims are not justiciable. As *Bandemer* has been abandoned and the U.S. Supreme Court has not articulated any new manageable standard for justiciability of partisan gerrymandering claims, the Pennsylvania Supreme Court should hold that Petitioners' partisan gerrymandering claims in this case are nonjusticiable under the Pennsylvania Constitution. *See Colegrove v. Green*, 328 U.S. 549, 556 (1946) (cautioning against courts entering the "political thicket" of redistricting).

467. Pennsylvania law has long adhered to federal precedent on these issues. *See Erfer*, 794 A.2d at 332. In particular, the Pennsylvania Supreme Court has long held that the equal protection provisions of Pennsylvania's Constitution are co-extensive with the Fourteenth Amendment's Equal Protection Clause, and, it is therefore axiomatic that the U.S. Supreme Court's standards will apply to Petitioners' equal protection-based partisan gerrymandering claim. *Id*.

468. Similarly, with regard to Petitioners' Free Speech and Association claim, although Pennsylvania's free speech and association provisions are broader than those of the U.S. Constitution, the Pennsylvania Supreme Court has expressly acknowledged that it looks to U.S. Supreme Court precedent for guidance in

addressing free expression claims. *See Pap's A.M. v. City of Erie*, 812 A.2d 591, 611 (Pa. 2002).

469. In the last 30 years, the U.S. Supreme Court has generated no less than 15 separate opinions directly addressing whether partisan gerrymandering claims could ever be viable. *See Bandemer*, 478 U.S. 109; *Vieth*, 541 U.S. 267; *LULAC*, 548 U.S. 399. None of those cases garnered a majority consensus from the Court. And as a result of these multiple plurality decisions, it remains doubtful whether such a claim could ever be viable, under any theory. Pennsylvania law should follow suit and hold partisan gerrymandering claims are not justiciable

B. Petitioners Fail to Propose a Judicially-Manageable Standard

470. Petitioners here do not provide any sort of judicially-manageable standard.

471. They propose three different tests purporting to evaluate a claim of partisan gerrymandering, and include a comparison against one or more computerized simulations of redistricting plans.

472. *First*, Petitioners propose the mean/median difference gap that purports to measure the "partisan skew of voters within a districting plan." (Trial Tr., Vol. I at 257:4-9).

473. *Second*, Petitioners propose adoption of the so-called "efficiency gap" test that measures the difference between "the number of wasted Democratic votes

minus the number of wasted Republican votes divided by the total number of votes." (Trial Tr., Vol. III at 836:12-25, 841:6-10). But the efficiency gap suffers from multiple flaws and is not a good measure of identifying partisan bias in a redistricting plan. (*See* Findings of Fact ¶¶ 364-409; LR Ex. 17 at 17-20).

474. *Third,* Petitioners propose two computer based simulation standards: (1) the Markov-Chain analysis that employs an algorithm that makes a series of alterations to voter precincts, swapping precincts in and out of districts in a random manner, (Trial Tr., Vol. III at 725:22-726:16, 731:13-20; Trial Tr., Vol IV at 1203:14-1204:6; LR Ex. 11 at 3); and (2) a second "analysis" based on a single political science professor's claimed sampling of what he states are "random" computer generated maps. (Trial Tr., Vol I at 165:22-167:20, 205:20-206:11). But these computer simulations too suffer from numerous fatal flaws and fail to accurately identify any partisan bias in the 2011 Plan. (Findings of Fact ¶¶ 268-363).

475. None of Petitioners' proffered tests offers a judicially manageable standard. These theories essentially mirror those asserted in *Whitford* and/or raised before the U.S. Supreme Court in the *Whitford* appeal. *See, e.g.*, *Whitford*, 218 F. Supp. 3d at 854; *see also* Pet. for Review ¶¶ Petrs. Opp'n Br. to Leg. Resp.'s Application for Stay at 16, 18, 19-21.

476. Neither the U.S. Supreme Court nor the Pennsylvania Supreme Court have accepted any one of these three theories and has heretofore rejected any claims of partisan gerrymandering as being non-justiciable. *See Vieth*, 541 U.S. at 285 (plurality op.).

C. Petitioners Have Not Proven an Equal Protection Claim

477. To the extent Petitioners' claims remain justiciable in light of *Vieth*, they are governed on the merits by *Erfer*. To prevail on a partisan gerrymandering claim under *Erfer*, Petitioners must establish two elements: (1) that when the General Assembly passed the 2011 Plan, it engaged in "intentional discrimination against an identifiable political group," *Erfer*, 794 A.2d at 332; and (2) that there was an "actual discriminatory effect on that group." *Id*. (citing *Bandemer*, 478 U.S. at 127).

478. The *Bandemer/Erfer* standard is "onerous" for a plaintiff to satisfy, and for good reason: "[t]he Bandemer plurality, aware that it was treading on ground that the judiciary had previously declared forbidden to itself, was chary about creating a test that would allow for officious interference with the state legislatures' prerogative to create reapportionment plans." *Erfer*, 794 A.2d at 333-334. S*ee also* U.S. Const. art. I, § 4. It is also onerous because the U.S. Supreme Court and the Supreme Court of Pennsylvania have both recognized that drawing Congressional districts is "the most political of legislative functions one not

amenable to judicial control or correction save for the most egregious abuses of that power." *Id*. at 334 (quoting and citing *Bandemer*, 478 U.S. at 143) (internal quotation marks omitted).

479. Petitioners have not proven the requisite intent or effects elements, and their Equal Protection claim therefore fails.

1. Petitioners have failed to satisfy the intent element.

480. To satisfy *Erfer*'s intent element, Petitioners must prove that when passing the 2011 Plan, the General Assembly engaged in "intentional discrimination against an identifiable political group." *Erfer*, 794 A.2d at 332.

481. But, because political classifications are perfectly acceptable and expected in redistricting, *Gaffney*, 412 U.S. at 753, *Vieth*, 541 U.S. 286; *see id*. at 307 (Kennedy, J., concurring), something more must be required to prove intent.

482. For example, the district court panel in *Whitford* required a showing that the Republicans intended to entrench themselves in power. *See* 218 F. Supp. 3d at 887-88, *stay pending appeal Gill v. Whitford*, 137 S. Ct. 2268 (U.S. June 19, 2017) (postponing jurisdictional questions until the merits).

483. Here, the parties have stipulated, and applicable testimony further supports, that the 2011 Plan passed with the support of Democrats in the General Assembly. (JS ¶ 58; Findings of Fact ¶¶ 15-33).

484. In particular, the following pieces of direct evidence demonstrate that the 2011 Plan was passed on a bipartisan basis, a result inconsistent with Petitioners' theory of discriminatory intent:

a. The support of Democratic Sen. Tina Tartaglione within the Senate State Government Committee was instrumental to passing the 2011 Plan, due to Republican opposition within that Committee. (Findings of Fact ¶¶ 15-17; Petrs. Ex. 178, Dinniman Trial Tr. at 61:8-16, 63:5-7).

b. The 2011 Plan passed the House in a broadly bipartisan fashion, with the support of 40% of the House Democratic Caucus. Moreover, bipartisan support was necessary for the 2011 Plan to pass the House due to Republican opposition. (Findings of Fact ¶ 30-33).

c. Representative Bob Brady (D-PA1), the senior-most Pennsylvania Member of Congress from the Democratic Party, was supportive of the 2011 Plan. (Petrs. Ex. 178, Dinniman Trial Tr. at 62:9-63:4).

485. Petitioners' indirect evidence from Dr. Chen purporting to establish discriminatory intent is insufficient for the following reasons:

a. Dr. Chen arrives at this conclusion through his claimed "random" map simulation process. (Trial Tr., Vol. I at 199:4-204:15).

b. Only 259 of the 1,000 maps that Dr. Chen drew contained at least one district with a majority-minority voting age population to attempt to satisfy the Voting Rights Act. (Trial Tr., Vol. I at 245:7-19; Petrs. Ex. 1, Chen Report at 33; LR Ex. 11, Cho Report at 22).

c. Dr. Chen admitted that he does not have any expertise with the Voting Rights Act, and therefore could not analyze whether any of his maps in fact satisfied the Voting Rights Act. (Trial Tr., Vol. II at 486:16-487:1-13).

d. Only 54 of the maps contained in Dr. Chen's Simulation Set 2 (the set that did not pair more than one incumbent Member of Congress) are compliant with traditional redistricting principles and contain one district with a majority-minority voting age population at or exceeding the existing Voting Rights Act district. (LR Ex. 11, Cho Report at 23; Trial Tr., Vol. IV at 1180:16-22).

e. For these reasons, the Court concludes that Dr. Chen's simulation models do not prove the extent to which partisan intent may have played a role in the drafting of the 2011 Plan and cannot allow for an inference to be drawn about the intent of the General Assembly.

486. Petitioners' evidence of intent derived from Dr. Pegden's analysis is also deficient.

a. Dr. Pegden's Markov-Chain analysis is deficient as an initial matter because it purports to compare the partisanship of the 2011 Plan, a map with 0% population deviation as the Constitution requires, against a set of maps that have 1-2% population deviation. (Trial Tr., Vol. III at 747:13-25; 748:11-25). Such apples-to-oranges comparisons are suspect.

b. Dr. Pegden's algorithm similarly disregarded several traditional districting principles, including political geography and incumbent protection. (LR Ex. 11, Cho Report at 10-11; Trial Tr., Vol. III at 780:20-23; Trial Tr., Vol. IV at 1218:21-1219:3, 1226:18-21**)**; *Mellow v. Mitchell*, 607 A.2d 204, 207-08 (Pa. 1992); *Karcher v. Daggett*, 462 U.S. 725, 740 (1983)).

c. For these reasons, the Court concludes that Dr. Pegden's analysis does not prove the extent to which partisan intent may have played a role in the passage of the 2011 Plan, nor can an inference be drawn from that analysis regarding legislative intent.

487. Petitioners' purported evidence from Dr. Warshaw fares no better:

a. Dr. Warshaw employs the so-called "efficiency gap" method (Trial Tr., Vol. II at 836, 852-854).

b. But the political geography of a state, which was not considered by Dr. Warshaw, can naturally affect this "efficiency gap." (Trial Tr., Vol. III at 982:10-16; 983:8-12).

c. Other factors such as the Voting Rights Act influence the so-called "efficiency gap," and it is not therefore sufficient evidence of any discriminatory intent. (Trial Tr., Vol. III at 983; 991:5-10; 1005:16-23).

d. Dr. Warshaw also admitted that competitive districts can exacerbate the so-called "efficiency gap's" numerical calculation, but failed to note or account for this flaw in the mathematical measure. (Trial Tr., Vol. III at 979-80).

e. The Court finds that Dr. Warshaw's analysis does not prove the extent to which partisan intent may have played a role in the drafting of the 2011 Plan, nor can the Court draw an inference from his analysis about the General Assembly's intent in drafting the 2011 Plan.

488. Petitioners have likewise failed to put on evidence sufficient to establish that an identifiable political group has been discriminated against, as required to prevail on an *Erfer* claim. In *Erfer*, the Court declined to reach the question of whether voters who are likely to support Democratic candidates for Congress constitute an identifiable political group. *Erfer*, 794 A.2d at 333. Here,

Petitioners identify the allegedly discriminated-against group as "Democratic voters," Pet. ¶ 116, but have not established that "Democratic voters" are a sufficiently concrete and identified political group.

489. After all, like the parties in *Erfer*, "Democratic voters" can encompass a wide range of persons and go well beyond mere membership in the Democratic Party. In addition, voters in Pennsylvania can and do, with some frequency, split their tickets between the Democratic and Republican Parties, further complicating the identification of a voter as a "Democratic voter." (Findings of Fact ¶ 41-59).

2. Petitioners have failed to satisfy the effect element.

490. To prevail on their *Erfer* claim, Petitioners must also establish that there was an "actual discriminatory effect on that group." *Erfer*, 794 A.2d at 332 (citing *Bandemer*, 478 U.S. at 127).

491. To satisfy this second element, Petitioners must make two showings. First, they must show that the 2011 Plan "works disproportionate results at the polls." *Erfer*, 794 A.2d at 333. Petitioners may establish this prong using actual election results or projected outcomes in future elections.

492. Second, petitioners must "adduce evidence indicating a strong indicia of lack of political power and the denial of fair representation, which in turn requires Petitioners to demonstrate that they have been "essentially … shut out of the political process." *Erfer*, 794 A.2d at 333; *see also id*. at 334 (finding that the

Erfer petitioners did not demonstrate that they had been shut out of the political process because it was undisputed that the Democrats had "safe seats").

493. This test is conjunctive, and Petitioners must satisfy both sub-elements to establish actual discriminatory effect. *Erfer*, 794 A.2d at 333.

494. Petitioners cannot show discriminatory effect merely by showing that the 2011 Plan makes it more difficult for Petitioners' preferred candidates to win. *Erfer*, 794 A.2d at 333. Likewise, Petitioners cannot establish the requisite discriminatory effect simply by showing that the enacted Plan fails to achieve proportional representation. *Id*.

495. On the contrary, "an individual or group of individuals who votes for a losing candidate is usually deemed to be adequately represented by the winning candidate and to have as much opportunity to influence that candidate as other voters in the district." *Erfer*, 794 A.2d at 333.

496. Petitioners must therefore show that the elected representative "entirely ignore[s]" the interests of those voters who voted for the losing candidate. *Erfer*, 794 A.2d at 333. This, too, is an "onerous" standard that is "difficult" for Petitioners to satisfy. *Id*. at 333. *See also Albert v. 2001 Legislative Reapportionment Comm'n*, 567 Pa. 670, 790 A.2d 989, 998 n.10 (Pa. 2002); *In re 1991 Pennsylvania Legislative Reapportionment Comm'n*, 609 A.2d at 141–42.

497. Petitioners here have not satisfied this "onerous" portion of *Erfer*'s test, and accordingly their claims must fail.

a. Petitioners Have Not Proven Disproportionate Election Results at the Polls.

498. The first prong of the discriminatory effect test requires Petitioners to prove disproportionate election results. *Erfer*, 794 A.2d at 333.

499. Petitioners have not done so.

500. Indeed, Petitioners have offered no evidence as to disproportionate election results. (Trial Tr. Vol. V at 1489:19-1490:1); (Findings of Fact ¶ 44-59).

501. Unlike membership in a racial group, "voters can—and often do—move from one party to the other or support candidates from both parties." *Bandemer*, 478 U.S. at 156 (O'Connor, J., concurring). This makes measuring the voting strength of a major political party onerous. *See id*.

502. Pennsylvania has historically experienced cross-party voting. *See Erfer*, 794 A.2d at 349-50.

503. In fact, as recently as 2016, Pennsylvania voters split their tickets, voting for Democrats in some races and Republicans in others. *See, e.g.*, (JS ¶¶ 127-28, 216-17).

504. Because Members of Congress are elected in single member districts in individual contests and not on a statewide basis, the U.S. Supreme Court has rejected the notion of aggregating statewide Congressional votes and using

proportional representation as a basis for a constitutional claim. *Bandemer*, 478 U.S. at 130; *id*. at 155 (O'Connor, J., concurring); *Vieth*, 541 U.S. at 282; *id*. at 308 (Kennedy, J., concurring).

b. Petitioners Have Not Proven a Lack of Political Power and Denial of Fair Representation.

505. Elected representatives are normally deemed to adequately represent those constituents who voted for the losing candidate. *See Erfer*, 794 A.2d at 333. These voters who voted for the losing candidate are also deemed to have the same opportunity to influence their elected representatives. *Id.* This is why Petitioners must prove that their elected representatives entirely ignore them. *Id*. at 334.

506. However, Petitioners have not proven that their elected representatives entirely ignore them. Rather, Petitioners acknowledge that they are able to contact their representative or the representative's aids, and that in some cases, they have been responsive. In fact, some Petitioners have gone so far as to say they are well represented by their Congressperson. (Findings of Fact ¶ 67, 70).

507. Moreover, to prove that Petitioners have "essentially been shut out of the political process," *Erfer*, 794 A.2d at 333, Petitioners must prove that there has been interference with Democrat registration, organizing, fundraising, voting, or campaigning. *See Badham*, 694 F. Supp. 670; *Pope*, 809 F. Supp. at 397; *see Erfer*, 794 A.2d at 333 (citing *Badham* and *Pope* for the proposition that to satisfy

the second element of the effects test, petitioners must prove that they have essentially been shut out of the political process).

508. Petitioners have adduced no such evidence here.

509. Petitioners' acknowledge they neither lack political power nor have they been "essentially shut out of the political system."

a. Petitioners testified that they are able to organize and protest laws that they do not like. (Findings of Fact ¶ 63).

b. No Petitioner has been prohibited from speaking in opposition to the views and/or actions of his/her Congressman or Congresswoman since the 2011 Plan became law. (JS ¶ 20);

c. Since the 2011 Plan was enacted, no Petitioner has been told by his/her Congressperson that their constituent services would be provided or denied on the basis of that Petitioner's partisan affiliation. (JS ¶ 21).

d. Petitioners are able to register to vote. (Findings of Fact ¶ 65).

e. Petitioners are able to make political contributions. (Findings of Fact ¶ 61).

f. Petitioners are able to campaign for their candidate of choice. (Findings of Fact ¶ 62).

g. Petitioners can and do vote often and are able to vote for their candidate of choice. (Findings of Fact ¶ 60).

h. Congressman Bob Brady, the senior-most Democrat in the Commonwealth's Congressional delegation supported the 2011 Plan. (Petrs. Ex. 179, Vitali Trial Tr. at 47:13-48:1, 48:24-49:7; Petrs. Ex. 178, Dinniman Trial Tr. at 62:9-63:4; Findings of Fact ¶ 227).

510. Petitioners also acknowledge that there are five safe Democratic seats within Pennsylvania's Congressional delegation. (Pet. ¶ 80; Trial Tr., Vol. III at 1022:12-15). This is the same number of safe seats held by Democrats after the 2002 plan that was upheld in *Erfer*. *See Erfer*, 794 A.2d at 334.

511. Indeed, this same number of Democrat seats constitutes a higher percentage of Pennsylvania's Congressional delegation than existed after the 2002 Redistricting (5/19 is a lower percentage than 5/18).

512. The existence of these seats alone demonstrates that there is no partisan effect that denies Petitioners fair representation. *See Erfer*, 794 A.2d at 334 ("[I]t is undisputed that at least five of the districts are "safe seats" for Democratic candidates, thus further undermining Petitioners' claim that Democrats have been entirely shut out of the political process.").

513. Nor did Petitioners' experts offer any credible evidence of "effect":

a. Although Dr. Warshaw testified that certain Republican Congressmen from Pennsylvania vote against what Democratic residents of his/her districts want (Trial Tr., Vol. III at 935:17-25-936:1-10), Dr. Warshaw admitted that he did not have any evidence that the 2011 Plan or redistricting in general contributed to polarization. (Trial Tr., Vol. III at 1018:5-8).

b. Nor did he study whether Petitioners' were shut out of the political process and "entirely ignored" by their representatives. (Trial Tr., Vol. III at 1028:13-20). Furthermore, Dr. Warshaw testified that redistricting does not cause polarization. (Trial Tr., Vol. III at 1017:24-25-1018:1-2; 1019:16-23; McCarty Report at 13).

c. Nor does redistricting exacerbate polarization. (Trial Tr., Vol. V at 1477:14-19; McCarty Report at 14). In fact, similar levels of polarization occur in the U.S. Senate as well. (Trial Tr., Vol. III at 1018:9-11; McCarty Report at 13). Thus, the Petitioners presented no evidence that the 2011 Plan causes Petitioners to be "entirely ignored" by their representative and shut out of the political process. *See Erfer*, 794 A.2d at 333; *Badham*, 694 F. Supp. 670; *Pope*, 809 F. Supp. at 397.

D. Petitioners Have Not Proven an Independent Free Expression and Association Claim

514. Petitioners have also not established a violation of Article I, §§ 7, 20 of the Pennsylvania Constitution by means of an alleged partisan gerrymander. In their Petition, Petitioners allege a violation of their free expression and association rights and a claim that Respondents retaliated against them for exercising their free speech rights. The Court finds this claim to be without merit.

515. While the Pennsylvania Supreme Court has not addressed this issue before, the Pennsylvania Supreme Court has relied upon U.S. Supreme Court First Amendment precedent to interpret its own constitutional free speech and freedom of association provisions. *See Pap's*, 812 A.2d at 611 ("[T]his Court has often followed the lead of the U.S. Supreme Court in matters of free expression under Article I, § 7[.]"). Accordingly, law interpreting the First Amendment is instructive.

516. The First Amendment is implicated when a state makes classifications on the basis of expression or association only to "the extent [they] compel[] or restrain[] belief and association…." *Elrod v. Burns*, 427 U.S. 347, 357 (1976); *see also Vieth*, 541 U.S. at 314–15 (Kennedy, J.) ("The [First Amendment] inquiry…is whether political classifications were used to burden a group's representational rights."). The First Amendment limits restraints on expressive and associational rights, *see Bantam Books, Inc. v. Sullivan*, 372 U.S. 58, 70 (1963), and retaliation

by government officials of the sort that "would deter a person of ordinary firmness from exercising his First Amendment rights." *Bridges v. Gilbert*, 557 F.3d 541, 552 (7th Cir. 2009). *See also Uniontown Newspapers, Inc. v. Roberts*, 576 Pa. 231, 839 A.2d 185, 253 (2003). For political parties, this involves a threshold showing of a burden on associational rights, such as compelled association, *Cal. Democratic Party v. Jones*, 530 U.S. 567, 573 (2000), or non-association, *Tashjian v. Republican Party of Conn.*, 479 U.S. 208, 214–17 (1986).

517. The First Amendment is also a poor vehicle to address the question of districting. The *Vieth* plurality expressed concerns that permitting a free speech claim "would render unlawful all consideration of political affiliation in districting, just as it renders unlawful all consideration of political affiliation in hiring for non-policy-level government jobs." 541 U.S. at 294 (plurality op.).

518. This concern is especially present in redistricting because some degree of partisanship is inevitable. *See, e.g.*, *Gaffney*, 412 U.S. at 753 ("Politics and political considerations are inseparable from districting and apportionment. … The reality is that districting inevitably has and is intended to have substantial political consequences."); *Cooper v. Harris*, 137 S. Ct. 1455, 1488 (2017) "([W]hile some might find it distasteful, our prior decisions have made clear that a jurisdiction may engage in constitutional political gerrymandering …") (internal quotations and alterations omitted) (Alito, J., Roberts, C.J., and Kennedy, J.,

dissenting); *Erfer*, 794 A.2d at 334 (stating that "reapportionment is the most political of legislative functions, one not amenable to judicial control or correction save for the most egregious abuses of that power.") (quoting *Bandemer*, 478 U.S. at 143).

519. Furthermore, even those courts that have examined free speech and expression claims in redistricting cases have held that there is no independent violation of free speech and association rights absent a violation of equal protection rights. *See Whitford*, 218 F. Supp. 3d at 884 (stating that elements to prove an unconstitutional partisan gerrymander under the First Amendment or the Equal Protection Clause are the same); *see also Republican Party v. Martin*, 980 F.2d 943, 959 n.28 (4th Cir. 1992) ("This court has held that in voting rights cases no viable First Amendment claim exists in the absence of a Fourteenth Amendment claim."); *Pope v. Blue*, 809 F. Supp. 392, 398-99 (W.D.N.C. 1992) *sum. aff'd* 506 U.S. 801 (1992) ("[W]e hold as in *Washington* that the plaintiffs' freedom of association claim is coextensive with the equal protection claim ….").

520. For reasons identical to those demonstrating that Petitioners have not proven that the 2011 Plan essentially shuts Petitioners out of the political process, Petitioners also have not proven that their free speech and associational rights have been violated, i.e., because nothing prevented Petitioners from speaking, endorsing candidates, campaigning for candidates, making political contributions, and voting

for candidates. *See, e.g.*, *League of Women Voters v. Quinn*, No. 1:11cv-5569, 2011 U.S. Dist. LEXIS 125531, at *12-13 (N.D. Ill. Oct. 28, 2011) ("The redistricting plan does not prevent any LWV member from engaging in any political speech, whether that be expressing a political view, endorsing and campaigning for a candidate, contributing to a candidate, or voting for a candidate."); *Comm. for a Fair & Balanced Map v. Ill. State Bd. of Elections*, 835 F. Supp. 2d 563, 575 (N.D. Ill. 2011); *Pope*, 809 F. Supp. at 398-99 (rejecting freedom of association claim because there is no "device that directly inhibits participation in the political process."); *Badham*, 694 F. Supp. at 675 ("Plaintiffs here are not prevented from fielding candidates or from voting for the candidate of their choice. The First Amendment guarantees the right to participate in the political process; it does not guarantee political success.").

521. Petitioners admit that they are able to campaign for their candidates of choice, register to vote, make political contributions, vote, and field their own candidates. (*See* Findings of Fact ¶¶ 60-67). Nor is there any basis to believe that any of the Petitioners were deterred from voting their conscience—especially in a state like Pennsylvania that has secret balloting—out of fear that the General Assembly would retaliate through a partisan gerrymander.

522. Petitioners' free speech and associational rights have therefore not been violated.

523. Petitioners cite *Shapiro v. McManus*, 203 F. Supp. 3d 579, 596 (D. Md. 2016) (three-judge court) to advance a standard applicable to this claim. If *Shapiro* were to be followed, Petitioners must show that "those responsible for the map redrew [the congressional district lines] with the specific intent to impose a burden" on Petitioners and those similarly situated because of how Petitioners voted or the political party to which Petitioners belong. *Id.* (emphasis in original).

524. But, as noted above, this is not an appropriate test. Rather, there is no free speech cause of action in redistricting cases independent of a cause of action brought under Pennsylvania's equal protection provisions.

525. But assuming *arguendo* that the Court were to adopt Petitioners' proposed *Shapiro*-based standard, Petitioners must then also demonstrate that partisan data was used with the specific intent to make it more difficult "for a particular group of voters to achieve electoral success because of the views they had previously expressed." *Id.* at 597.

526. Petitioners must also demonstrate that the 2011 Plan diluted Petitioners' vote in a "sufficiently serious" manner producing a "demonstrable and concrete adverse effect." *Id*. at 598.

527. Finally, Petitioners must prove that absent the legislature's intent to burden Petitioners' vote, "the concrete adverse impact would not have occurred." *Id*. at 597.

528. Here, Petitioners have not proven that the legislature had the specific intent to make it more difficult for Democrats to achieve electoral success because of their views, especially in light of the significant number of Pennsylvania House Democrats who voted to enact the 2011 Plan. (*See* Findings of Fact ¶¶ 15-16, 31).

529. Furthermore, Petitioners' vote is not sufficiently diluted in a manner that produces a "demonstrable and concrete adverse effect." *Shapiro*, 203 F. Supp. 3d at 598.

530. The same three-judge panel that found plaintiffs in *Shapiro* stated a First Amendment claim, later found that the plaintiffs were not likely to succeed on that claim because they did not prove causation. *Benisek v. Lamone*, No. 13-3233, 2017 U.S. Dist. LEXIS 136208 at *30-34 (D. Md. Aug. 24, 2017) (three-judge panel).

531. The divided panel found that plaintiffs were not likely to succeed on their First Amendment claim because plaintiffs could not prove the alleged gerrymander was the but-for causation that "flipped" the Sixth Congressional District from Republican to Democrat. *See id*. at *20-21.

532. The Court arrived at this conclusion because voter preferences are mutable and are capable of change. *Id*. at *21.

533. There was evidence of split ticket voting where the Republican congressional candidate lost to the Democrat by 20.9% but the Democrat Senate candidate won that congressional district with just 50% of the vote. *Id*. at *24.

534. Furthermore, in a subsequent congressional election, the Democrat barely won re-election while the Republican gubernatorial candidate won in the challenged congressional district with 56% of the vote. *See id*. at *25.

535. This evidence persuaded the court to state it could not conclude that the "likely outcome...was that but for the alleged gerrymander, the Republican Party would have retained control" of the Sixth Congressional District. *Id*. at *30.

536. Furthermore, the court ruled that there was no evidence from the plaintiffs, e.g., affidavits, statistical data, or voter sampling "to demonstrate *how* or *why* voters who would have been included in a neutrally drafted Sixth District voted in the 2012, 2014, and 2016 elections." *Id* (emphasis in the original).

537. Additionally, the court stated that the surprising election results of 2016 demonstrated that voter preferences are mutable and thus elections are unpredictable. *Id*. at *31-32; citing *Bandemer*, 478 U.S. at 160 (O'Connor, J., concurring).

538. Similarly, here in Pennsylvania some congressional districts were won by a Republican, but that district voted for Hillary Clinton. Still other

congressional districts voted for a Democrat for Congress but voted for Donald Trump for President. *See* JS ¶¶ 127-28; 216-18.

539. Additionally, on a statewide level, Pat Toomey and Donald Trump won U.S Senate election and President respectively in Pennsylvania but Democrats won Attorney General, Auditor General, and Treasurer. Consequently, Pennsylvania experiences split ticket voting. *See* JS ¶¶ 216-18.

540. It therefore cannot be proven that Pennsylvania's 2011 Map was the "but for" cause of Republicans winning 13 congressional districts and Democrats winning 5 congressional districts. Petitioners' free speech and association claim therefore fails.

E. Petitioners Lack Standing

541. For a party to have standing in Pennsylvania that party must establish: (1) "a substantial interest in the subject matter of the litigation; (2) the party's interest must be direct; and, 3) the interest must be immediate and not a remote consequence of the action." *See Erfer*, 794 A.2d at 329 (citations and quotations omitted).

542. Because standing requires a direct interest in the subject-matter of the lawsuit, a single Petitioner does not have standing to file a challenge to a statewide map; rather, a Petitioner may bring a challenge only to the Petitioner's specific district.

543. Regarding racial gerrymandering claims brought under the Fourteenth Amendment's Equal Protection Clause, the U.S. Supreme Court has ruled that these claims "[a]ppl[y] to the boundaries of individual districts. It applies district-by-district. It does not apply to a State considered as an undifferentiated 'whole.'" *Ala. Legis. Black Caucus v. Alabama*, 135 S. Ct. 1257, 1265 (2015). The required injury is personal to the voter who lives in the racially gerrymandered district because that voter is personally subjected "to [a] racial classification." *Id*. As such, that voter is forced to live in a district with an elected representative "who believes his primary obligation is to represent only the members of a particular racial group." *Id*. (internal quotation marks omitted).

544. While the Supreme Court of Pennsylvania has rejected the argument that a redistricting plaintiff is limited to bringing a challenge to the district where that plaintiff resides, *see Erfer*, 794 A.2d at 329-30, based on the reasoning of the U.S. Supreme Court set forth above, *Erfer* should be overruled or otherwise held inapplicable on that point.

545. Petitioners here do not have standing to challenge the statewide map. (*See* Findings of Fact ¶¶ 68-72).

F. This Court Lacks the Authority to Adopt Any Criteria that the Pennsylvania Legislature Has Not Adopted

546. The U.S. Constitution vests the state legislatures with the authority to enact Congressional districts. *See* U.S. Const. art. I, § 4. *Lance v. Coffman*, 549

U.S. 437 (2007) ("The Elections Clause of the United States Constitution provides that the "Manner of holding Elections for Senators and Representatives, shall be prescribed in each State by the Legislature thereof."); *Chapman v. Meier*, 420 U.S. 1, 27 (1975) ("We say once again what has been said on many occasions: reapportionment is primarily the duty and responsibility of the State through its legislature or other body, rather than of a federal court."); *see also Ariz. State Legis. v. Ariz. Indep. Redistricting Comm'n*, 135 S. Ct. 2652, 2685 (2015) (Roberts, C.J., dissenting) ("[W]here there is a conflict of authority between the constitution and legislature of a State in regard to fixing place of elections, *the power of the legislature is paramount*.") (emphasis added) (internal quotation marks omitted) (quoting *Baldwin v. Trowbridge*, 2 Bartlett Contested Election Cases, H. R. Misc. Doc. No. 152, 41st Cong., 2d Sess., 46 (1866)).

547. Included within this broad grant of authority is the power to establish the criteria by which the legislature draws Congressional districts. *See Tashjian v. Republican Party*, 479 U.S. 208, 217 (1986) ("[T]he Constitution grants to the States a broad power to prescribe the "Times, Places and Manner of holding Elections for Senators and Representatives . . . "); *Smiley v. Holm*, 285 U.S. 355, 366 (1932) ("It cannot be doubted that these comprehensive words embrace authority to provide a complete code for congressional elections.")

548. The Pennsylvania Constitution adopted certain criteria for drawing its state legislative districts including, for example, requiring compact and contiguous territory, single member districts, and that each district be as nearly as equal in population as practicable. *See* Pa. Const. art. II, § 16.

549. On the other hand, Pennsylvania's Constitution does not include any similar requirements for Congressional districts analogous to those for the state legislature. Additionally, the legislature has not enacted any statutes that would apply these criteria to establishment of the Commonwealth's congressional districts.

550. Because the U.S. Constitution vests Pennsylvania's legislature with the primary duty of drawing Congressional districts, *see* U.S. Const. art. I, § 4, this Court cannot impose on the legislature any conditions or criteria that the legislature itself has not adopted. *See Upham v. Seamon*, 456 U.S. 37, 41-42 (1982) ("[W]e hold that a district court should similarly honor state policies in the context of congressional reapportionment. In fashioning a reapportionment plan or in choosing among plans, a district court should not pre-empt the legislative task nor intrude upon state policy any more than necessary.").

551. Accordingly, even if the Supreme Court of Pennsylvania were to find the 2011 Plan unconstitutional and order the legislature to draw new districts, the Supreme Court of Pennsylvania cannot impose new criteria that have not been

adopted by the legislature or enshrined within Pennsylvania's Constitution. To impose any new criteria on the legislature for drawing Congressional districts would violate Article I, Section 4 of the United States Constitution.

552. Indeed, in every case where a state court has struck down a Congressional plan, it has been because of a violation of either federal law, *see e.g.*, *Hippert v. Ritchie*, 813 N.W.2d 391, 394 (Minn. 2012); *Perrin v. Kitzhaber*, 83 P.3d 439, 443-44 (Or. 2004), or expressly applicable state constitutional provisions. *e.g.*, *League of Women Voters of Florida v. Detzner*, 172 So.3d 363, 369-372 (Fla. 2015); *People ex rel. Salazar v. Davidson*, 79 P.3d 1221, 1237-1243 (Colo. 2003). No such circumstances exist here.

December 18, 2017

Respectfully Submitted

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