No. 143, Original

IN THE
Supreme Court of the United States

STATE OF MISSISSIPPI,
Plaintiff,

v.

STATE OF TENNESSEE, CITY OF MEMPHIS, TENNESSEE,
AND MEMPHIS LIGHT, GAS & WATER DIVISION,
Defendants.

On Bill of Complaint
Before the Special Master, Hon. Eugene E. Siler, Jr.

POST-HEARING BRIEF OF THE STATE OF TENNESSEE

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2018 Op.	Memorandum of Decision on Defendants' Motion for Summary Judgment, *Mississippi v. Tennessee, et al.*, No. 143, Orig. (U.S. Nov. 29, 2018) (opinion of Special Master) (Dkt. No. 93)
Aquifer	Middle Claiborne Aquifer
CMP	Case Management Plan (Oct. 26, 2016) (Dkt. No. 57)
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USGS	United States Geological Survey

INTRODUCTION

The Special Master twice has concluded that, if this case concerns an interstate water resource, Mississippi's claims must be dismissed. He also discerned "strong evidence that the Aquifer and the water are interstate in nature," but decided that an "evidentiary hearing will help us know for sure." 2018 Op. 27.

We now know for sure. The evidence at the hearing overwhelmingly confirmed what the Special Master already had discerned from the discovery record: that the Aquifer at issue is an interstate groundwater resource. It is a single hydrogeological unit that extends beneath eight States; pumping within one State can and often does affect water in other States; and it is hydrologically connected to interstate surface waters. The cross-border flows in the Aquifer under natural conditions – which the trial testimony established as far greater than what Mississippi had alleged – further confirm its interstate character. If this eight-state, regional resource is not "interstate" in nature, it is hard to conceive of one that is.

The trial evidence on each of those points was overwhelming, and Mississippi scarcely even attempted to refute it. Indeed, Mississippi's own experts – when not addressing irrelevant topics like damages – repeatedly testified to facts that highlight the interstate nature of the eight-state Middle Claiborne Aquifer. Because Mississippi's claims to water within that Aquifer concern an interstate water resource, it cannot sue Tennessee or MLGW for actions taken within Tennessee

unless and until it obtains an equitable apportionment or an interstate compact. But, of course, there is no compact, and Mississippi has disclaimed any apportionment. For those reasons, and for the many others explained at the hearing, Mississippi's claims should be dismissed with prejudice.

ARGUMENT

I. THE DOCTRINE OF EQUITABLE APPORTIONMENT PRECLUDES MISSISSIPPI'S CLAIMS OVER ANY INTERSTATE WATER RESOURCE

A. The Federal Equitable-Apportionment Doctrine Governs All Interstate Water Resources

As the Special Master has explained, "'[e]quitable apportionment is the doctrine of federal common law that governs disputes between states concerning'" an interstate water resource. 2018 Op. 25 (quoting *Colorado v. New Mexico*, 459 U.S. 176, 183 (1982)). For more than a century, "disputes over the allocation of water [have been] subject to equitable apportionment by the courts." *Tarrant Reg'l Water Dist. v. Herrmann*, 569 U.S. 614, 619 (2013). The Supreme Court has applied that doctrine to a wide array of interstate resources, including rivers, *see*, *e.g.*, *Nebraska v. Wyoming*, 325 U.S. 589, 617-19 (1945); groundwater connected to interstate surface water, *see*, *e.g.*, *Nebraska v. Wyoming*, 515 U.S. 1, 14 (1995); *Washington v. Oregon*, 297 U.S. 517, 522-23 (1936); and even migratory fish, *see Idaho ex rel. Evans v. Oregon*, 462 U.S. 1017, 1024-25 (1983). As the Special Master has concluded twice already, equitable apportionment applies to interstate

groundwater just as it does to those other interstate resources. 2016 Op. 25; 2018 Op. 26.

Groundwater resembles surface water in all of the relevant ways. *See Hood ex rel. Mississippi v. City of Memphis*, 570 F.3d 625, 630 (5th Cir. 2009). Most importantly, equitable apportionment applies "when 'the action of one State reaches through the agency of natural laws into the territory of another State.'" 2016 Op. 20 (quoting *Idaho ex rel. Evans*, 462 U.S. at 1024 n.8). That doctrine thus provides a State's sole judicial remedy whenever "a simple consequence of geography" allows one State to "depriv[e]" another State "of the benefit of water." *Kansas v. Nebraska*, 135 S. Ct. 1042, 1052 (2015). In an interstate aquifer, just as in an interstate river, such cross-border effects are a natural consequence of a State using the resource. 2016 Op. 20. For that reason, "equitable apportionment is appropriate if this case involves an interstate resource." 2018 Op. 10.

B. The Equitable-Apportionment Doctrine Precludes All Of Mississippi's Claims

The Special Master already has recognized that the equitable-apportionment doctrine would require dismissal of Mississippi's claims if the Middle Claiborne Aquifer is interstate. 2016 Op. 35-36; 2018 Op. 26. That is because Mississippi's claims are based on the premise that it "owns" certain parts of the water within the Aquifer. But equitable apportionment – not the property-rights concepts Mississippi invokes – supplies the exclusive judicial remedy for a State claiming rights in an

interstate resource. *See Kansas v. Nebraska*, 135 S. Ct. at 1052. As the Special Master has explained, Mississippi has not "lost rights to the water" at issue; rather, "equitable apportionment supplies the proper method for determining rights." 2018 Op. 21. And, under that flexible doctrine, a "State may not preserve solely for its own inhabitants natural resources located within its borders." *Idaho ex rel. Evans*, 462 U.S. at 1025.

Mississippi's ownership theory conflicts with that well-established framework for resolving disputes over interstate water resources. As the Special Master has concluded: "States have an important interest in, and may regulate and control natural resources, but they do not own those resources." 2018 Op. 23. In fact, the Supreme Court has rejected the "whole ownership theory" as "a fiction" that is merely "legal shorthand" for the State's important regulatory interests. *Id.* at 22-23 (citing *Missouri v. Holland*, 252 U.S. 416, 431-34 (1920) (migratory birds); *Hughes v. Oklahoma*, 441 U.S. 322, 337-38 (1979) (minnows); *Idaho ex rel. Evans*, 462 U.S. at 1024-25 (fish)). And in *Sporhase v. Nebraska ex rel. Douglas*, 458 U.S. 941 (1982), the Court rejected the claim that groundwater is any different and held that States do not own the groundwater within their borders. 2018 Op. 23.

Those principles are fatal to Mississippi's claims here. Indeed, Mississippi's Complaint asserts a variety of state-law tort claims all premised on the same flawed assertion of an ownership interest in an unapportioned interstate resource. *See* Tenn.

MJOP 14-18. The Special Master rightly concluded that federal common law would preempt Mississippi's state-law claims in such circumstances. 2016 Op. 24. And because "[e]quitable apportionment is the doctrine of federal common law that governs disputes between States concerning their rights to use the water of an interstate [resource]," *Colorado v. New Mexico*, 459 U.S. at 183, it displaces other federal common-law torts as well, *see* 2018 Op. 25-26 (rejecting nuisance theory from *Missouri v. Illinois*, 180 U.S. 208 (1901)).

Mississippi's claims also raise significant policy concerns. First, applying a different rule to groundwater would be difficult to administer because of the hydrological connections between groundwater and surface water. Recognizing that connection, the Supreme Court repeatedly has applied equitable apportionment to disputes over interstate surface water with a groundwater component. 2016 Op. 20 (citing *Texas v. New Mexico*, 462 U.S. 554, 556-58 & n.2 (1983)); *see also Nebraska v. Wyoming*, 515 U.S. at 14; *Washington v. Oregon*, 297 U.S. at 524-25.

Second, applying a sovereignty-based framework to groundwater would destabilize national water policy and frustrate the "public interest." *See Kansas v. Nebraska*, 135 S. Ct. at 1053 (considering the "public interest" in fashioning an equitable apportionment). Any State that pumps within an interstate aquifer sufficiently close to a state border will, because of the natural laws of hydraulics, draw water across the border. Defs.' PFOF ¶ 116. Under Mississippi's theory,

therefore, States across the country could be forced to defend themselves against lawsuits threatening ruinous liability and disruption of existing water uses – uses established in reasonable reliance on the Supreme Court's equitable-apportionment precedents. Defs.' PFOF ¶ 110; *see* U.S. Amicus Br. 22. *See also Nevada v. United States*, 463 U.S. 110, 129 n.10 (1983) (recognizing the importance of "stability" of water rights). Equitable apportionment of groundwater resources allows the Court to decide these important issues in a more principled way. The Court should rely on equitable considerations – not difficult historical reconstructions of pre-development flow – in assigning valuable water rights to interstate resources. Those concerns reinforce the doctrinal conclusion the Special Master already has reached: if the Aquifer is an interstate resource, Mississippi's claims fail as a matter of law.

C. Mississippi's Reliance On The Equal-Footing And Public-Trust Doctrines Is Misplaced

Mississippi claims sovereign authority over groundwater in the Middle Claiborne Aquifer based on the equal-footing and public-trust doctrines. But the Special Master rightly has recognized that Mississippi's equal-footing argument "sails wide of its target," 2018 Op. 21, and twice has rejected it, *id.*; 2016 Op. 21-22. The equal-footing doctrine merely gives Mississippi rights equal to the rights of all other States. *See Puerto Rico v. Sanchez Valle*, 136 S. Ct. 1863, 1871 (2016). The doctrine does not apply "to disputes concerning a State's pumping from an

interstate resource," because no State has a sovereign right to an unapportioned interstate water resource. 2016 Op. 21.

At most, the cases Mississippi has cited (at Opp. to MJOP 8-12) indicate that Mississippi has sovereign authority within its own boundaries, such that it can prevent another State from entering its territory to access an interstate resource. 2016 Op. 21-22 (citing *Kansas v. Colorado*, 206 U.S. 46, 93 (1907); *Tarrant Reg'l Water Dist.*, 569 U.S. at 626-28). But, as the evidence at the hearing confirmed, MLGW's pumping occurs entirely within Tennessee. 2018 Op. 17. Defs.' PFOF ¶ 118. Mississippi does not have the right to control actions within Tennessee's borders, even if those actions affect an interstate resource within Mississippi. 2016 Op. 22-23. In fact, the rule Mississippi advocates would impinge on Tennessee's sovereign rights to control the use of natural resources within *its* own borders, depriving it of the ability to develop the Aquifer in the border region, including beneath Memphis. *See Tarrant Reg'l Water Dist.*, 569 U.S. at 631; *Kansas v. Colorado*, 206 U.S. at 95 (because "neither state can enforce its own policy upon the other," equitable apportionment is required).

Mississippi misapprehends the public-trust doctrine for similar reasons. Under that doctrine, a State holds in trust for its citizens the intrastate waters and submerged lands confined within its own territorial borders. *See Cinque Bambini P'ship v. State*, 491 So. 2d 508, 516-17 (Miss. 1986), *aff'd sub nom. Phillips*

Petroleum Co. v. Mississippi, 484 U.S. 469 (1988). The public-trust doctrine says nothing about the rights of a State to an interstate resource, which implicates the co-equal rights of another sovereign. In those circumstances, the federal equitable-apportionment doctrine supplies a State's exclusive remedy.

II. THE EVIDENCE AT TRIAL ESTABLISHED THAT THE AQUIFER AND THE WATER IN IT CONSTITUTE AN INTERSTATE RESOURCE

The evidentiary hearing established that the Middle Claiborne Aquifer is interstate, such that Mississippi's claims are preempted by the equitable-apportionment doctrine. *See Hinderlider v. La Plata River & Cherry Creek Ditch Co.*, 304 U.S. 92, 104-05 (1938). At the summary-judgment stage, Defendants had "present[ed] strong evidence that the Aquifer and water are interstate in nature" under four distinct theories, 2018 Op. 27: (1) Mississippi's claims concern a single aquifer underlying multiple States, *id.* at 10-14; (2) the effects of pumping cross state borders, *id.* at 14-18; (3) groundwater in the Aquifer flowed naturally across state borders and eventually would have left Mississippi, *id.* at 18-19; or (4) it is connected hydrologically with interstate surface waters, *id.* at 19-20. The trial evidence confirmed that the Middle Claiborne Aquifer is an interstate resource under each and all of those theories.

A. The Water Resource At Issue Is A Single Hydrogeological Unit That Extends Beneath Eight States

1. As the Special Master has held, "the geological characteristics of a water resource are relevant to whether [the water at issue] should be considered interstate in nature." 2016 Op. 31. For example, the Supreme Court recognizes the consensus of knowledgeable individuals and experts – "geographers, explorers, and travelers" – as persuasive evidence of the geographic extent of a water resource. *Kansas v. Colorado*, 206 U.S. at 115. The geographic extent of the groundwater resource at issue here confirms that it is interstate.

The hearing revealed a scientific consensus that the pumping at issue occurs in the Middle Claiborne Aquifer, a single hydrogeological unit that spans multiple States, including Mississippi and Tennessee. Defs.' PFOF ¶¶ 64-65. Undisputed testimony established that the Aquifer extends beneath eight States, which is consistent with all of the relevant scientific literature from the USGS and others. Defs.' PFOF ¶ 64. Although all five experts called this unit the "Middle Claiborne Aquifer," they also noted that the scientific literature uses alternative terms at times. *Compare* Tr. 87:1-15 (Dr. Spruill testifying that "[t]he Middle Claiborne Aquifer is a very important aquifer in the Mississippi Embayment") *with* Tr. 293:20-22 (Dr. Spruill explaining that he "also used the phrase 'Sparta Memphis Sand Aquifer'" in his expert report "[b]ecause it's in the literature"). *See* Defs.' PFOF ¶ 59. Despite those occasional naming variations, every relevant study cited by the experts

provides substantially similar eight-state maps of the Aquifer's boundaries. *E.g.*, J-4 at 64 (Plate 5);[1] J-71; Defs.' PFOF ¶ 136.

Hydrologists recognize the Middle Claiborne Aquifer as a single unit because its geological and hydrological properties – for example, its composition, hydraulic conductivity, and water levels – are continuous beneath Tennessee, Mississippi, and six other States. Defs.' PFOF ¶¶ 67-73. Further, groundwater is able to flow continuously through the Middle Claiborne Aquifer across the Mississippi-Tennessee border and all other political boundaries overlying the Aquifer. Defs.' PFOF ¶ 75. And there is no barrier in the Aquifer preventing or impeding the lateral flow of water within the Aquifer across the Mississippi-Tennessee border or elsewhere.[2] Defs.' PFOF ¶ 76.

True, there is some variation in hydrogeological characteristics throughout the Aquifer, but that does not prevent scientists from recognizing its entire extent as a single, laterally extensive unit. Defs.' PFOF ¶¶ 64, 68-69. Variations are common – in fact, the norm – in aquifers, and the Middle Claiborne Aquifer's heterogeneity is consistent with its status as a single, eight-state hydrogeological unit. Defs.' PFOF ¶ 22. Such an eight-state unit exemplifies the sort of interstate water resource to which the equitable-apportionment doctrine applies.

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[1] All page number citations to exhibits reference the stamped page of the exhibit.

[2] Nor has there ever been such a barrier. Defs.' PFOF ¶ 77.

2. Mississippi's attempt to recharacterize the Middle Claiborne Aquifer as two or more separate aquifers is scientifically unsound. As discussed, expert testimony from all five witnesses established that scientists recognize the Middle Claiborne Aquifer as a single unit extending beneath eight States, despite local variations in its hydrogeological properties. Defs.' PFOF ¶¶ 64-65. The so-called "facies change," which occurs in the Aquifer slightly south of the Mississippi-Tennessee border, does not divide the Middle Claiborne Aquifer into multiple separate hydrogeologic units.[3]

Regardless of naming conventions or characterizations, there is a scientific consensus about the Aquifer's basic hydrogeological facts in the area surrounding Memphis, including the area south of the Mississippi-Tennessee border. In this area, there is a thick, vertically continuous layer of fully saturated sand (with some other materials interspersed). Defs.' PFOF ¶¶ 79, 199. As this sand layer travels south, the middle part of the layer (vertically – i.e., partway *down* through the sand layer) gradually transitions from coarser-grained sand to finer-grained materials, primarily

[3] Mississippi also is conclusively bound by its admission during discovery that "the general geologic formation known as the Sparta Sand underlies several states, including Mississippi, Tennessee, and Arkansas." D-150, at 2; *see* CMP ¶ 4(b) (adopting Federal Rule of Civil Procedure 36(b), which provides that this admitted fact has been "conclusively established"). This admission directly conflicts with Mississippi's novel position that the "Sparta Sand" does not exist in Tennessee; on the other hand, it accords with the expert consensus that one aquifer – by whatever name – underlies Mississippi, Tennessee, Arkansas, and other States.

clay. Defs.' PFOF ¶ 79. As several witnesses testified, the shape of this sand layer can be visualized as a two-pronged fork; the "handle" is the single thicker layer to the north, which gradually splits into two "prongs" (above and below the clay confining layer) going south. Defs.' PFOF ¶¶ 198-199. No hydrogeological barrier interrupts the continuity of the fully saturated sand either above or below the clay, and water can flow freely between the "prongs" and the "handle." Defs.' PFOF ¶ 200. Thus, for purposes of determining the *areal* or *lateral* geographic extent of the relevant hydrogeological unit, the facies change is irrelevant; all the evidence shows that the relevant sand layer is laterally continuous across Mississippi and Tennessee, as well as the other six States previously noted.

The naming conventions that Mississippi invoked to describe this interconnected sand layer have no significance. To begin, there is no basis to distinguish between the "upper prong" and the "handle." As the expert witnesses agreed, the "handle" of this hydrogeologic unit sometimes is called the Memphis Aquifer. Defs.' PFOF ¶ 202. The "upper prong" is sometimes called the Sparta Aquifer. Defs.' PFOF ¶ 203. All of the experts agreed that both are called the Middle Claiborne Aquifer, or sometimes the "Memphis-Sparta Aquifer," "Sparta-Memphis Aquifer," and variations thereof. Defs.' PFOF ¶¶ 59, 197. There was no dispute that the "upper prong" and the "handle" constitute a single hydrogeologic unit extending beneath parts of eight States, despite occasional suggestions that the

Sparta and the Memphis were different "formations" within the larger Middle Claiborne Aquifer. Defs.' PFOF ¶ 95; *see* Tr. 99:9-13 (Spruill).

Nor is there a relevant distinction between the "lower prong" and the "handle." The "lower prong" sometimes is called the Meridian Sand or the Lower Claiborne Aquifer, and is distinguished for some purposes from the Middle Claiborne Aquifer – for example, in the USGS's MERAS model. Defs.' PFOF ¶ 198. But describing the Memphis Aquifer as "separate" from the Meridian is misleading. The Meridian Sand is continuous with the Memphis Sand in the same way as the Sparta Sand is continuous with the Memphis Sand. Defs.' PFOF ¶¶ 204-205, 207. The "Lower Claiborne Aquifer" is therefore part of the Middle Claiborne Aquifer, just as both the Sparta and the Memphis are considered the Middle Claiborne Aquifer.

Confirming that understanding, both of the experts who did significant computer modeling in this case treated the entire unit – the upper and lower "prongs" and the "handle" – as the Middle Claiborne Aquifer. Mr. Wiley, Mississippi's expert, used two models, the Brahana & Broshears model and the MERAS model; in both, he treated the entirety of the unit as one aquifer called the Middle Claiborne Aquifer. Defs.' PFOF ¶¶ 280, 285; Tr. 553:3-23. Dr. Langseth did the same when he used the MERAS model. D-191 at 16. Thus, even though the MERAS model at times describes the "lower prong" as the Lower Claiborne Aquifer rather than the

Middle Claiborne Aquifer, both experts considered them together for purposes of this case. Because they form a laterally continuous layer of saturated sand, they act as a single hydrogeological unit across their combined geographic extent.

3. Factual infirmities aside, the alleged differences between the Sparta, the Memphis, and the Lower Claiborne aquifers are also legally irrelevant. *First*, water bodies may have different names while still forming a single interstate water resource for purposes of an equitable apportionment. Indeed, one of the Supreme Court's recent equitable-apportionment cases, *Florida v. Georgia*, 138 S. Ct. 2502 (2018), involved a single interstate water resource that consisted of three rivers with different names, forming a "Y" shape where two of the rivers flowed into the third. *Id.* at 2508. Despite the presence of several arguably distinct bodies of water (the Apalachicola River, the Chattahoochee River, and the Flint River, as well as Lake Seminole), the Court recognized the existence of *one* resource – "an interstate *river basin* known as the Apalachicola–Chattahoochee–Flint River Basin." *Id.* (emphasis added). Nor did it matter that the Flint River flows exclusively in Georgia, while the Apalachicola River exists solely in Florida, *see id.* at 2528 (Appendix), because the two rivers were hydrologically connected. Hydrological realities, not naming conventions, determine the nature and extent of an interstate water resource.

Second, even if Mississippi were correct that the Sparta, the Memphis, and the Lower Claiborne were separate aquifers, undisputed testimony established that each

still would underlie multiple States. Most obviously, the Memphis Aquifer still would underlie both Mississippi and Tennessee, because the facies change occurs south of the state border. Defs.' PFOF ¶ 214. All three would underlie Arkansas, and each would underlie other States as well. Defs.' PFOF ¶¶ 214-215; J-36 at 30. No evidence suggested that any relevant aquifer underlies only a single State. However many aquifers actually exist within the Middle Claiborne, the groundwater Mississippi is claiming must be part of an interstate water resource.

Third, Mississippi's effort to distinguish the Lower Claiborne Aquifer from the Middle Claiborne Aquifer is irrelevant because Mississippi's claims relate only to water in the "Sparta Sand" Aquifer. Compl. ¶ 40. If the Sparta is separate at all, it consists of the aquifer *overlying* the Lower Claiborne Confining Unit. Defs.' PFOF ¶ 203. The Lower Claiborne Aquifer refers solely to the water *underlying* that confining unit, and Mississippi has made no claim relating to any of that water. Accordingly, the proper characterization of the Lower Claiborne Aquifer has no bearing on whether Mississippi's claims touch on an interstate water resource.

B. The Aquifer Is An Interstate Resource Because The Effects Of Pumping In The Aquifer Cross State Borders

As the Special Master has recognized, the Supreme Court considers a resource to be interstate if "'the removal of water within a State's borders can have a direct effect on the availability of water in another State.'" 2018 Op. 14 (quoting 2016 Op. 31). The "power to control . . . public uses of water" is "'an essential attribute of

sovereignty,'" *Tarrant Reg'l Water Dist.*, 569 U.S. at 631 (quoting *United States v. Alaska*, 521 U.S. 1, 5 (1997)), but States' "equal rights" to each use resources within their own borders may require equitable apportionment when such a use "reaches, through the agency of natural laws, into the territory of another State," *Kansas v. Colorado*, 206 U.S. at 97-98. The cross-border effects of pumping in the Middle Claiborne Aquifer exemplify those "natural laws" and confirm that the Aquifer is an interstate water resource. *Id*.[4]

The evidence at the hearing established that pumping from the Middle Claiborne Aquifer can and does affect water levels in the same Aquifer in neighboring States. Pumping water out of wells creates "cones of depression," meaning that the water level or potentiometric head surrounding the well is lowered. Defs.' PFOF ¶¶ 38-39. Political borders do not affect cones of depression; a cone of depression will propagate outward from the well for a given distance unless it meets a barrier, and there are no lateral barriers within the Middle Claiborne Aquifer. Defs.' PFOF ¶¶ 69-70, 72-73, 76, 114. Thus, cones of depression can extend across any state borders within the eight-state footprint of the Middle Claiborne Aquifer. Defs.' PFOF ¶¶ 73, 126-130.

[4] Even if, contrary to all of the evidence, multiple separate hydrogeologic units were at issue, these cross-border effects still would show independently that the hydrogeological system and the groundwater at issue is an interstate water resource.

Most relevant here, all five experts agreed that no barrier prevents or impedes cross-border flow between Mississippi and Tennessee. Defs.' PFOF ¶ 76. As a consequence, the effects of groundwater pumping can and do cross the Mississippi-Tennessee border. Defs.' PFOF ¶¶ 74, 119-124. It was undisputed that there is a regional cone of depression centered on Memphis that extends into Mississippi. Defs.' PFOF ¶¶ 120-121. MLGW's wells contribute to this cone of depression, and the effects of MLGW's wells propagate into Mississippi. Defs.' PFOF ¶¶ 124, 227. Pumping in DeSoto County, Mississippi, also contributes to the regional cone of depression and affects water levels in Tennessee. Defs.' PFOF ¶¶ 120, 123. These effects provide a textbook example of one State "reach[ing], through the agency of natural laws, into the territory" of other States. *Kansas v. Colorado*, 206 U.S. at 97-98. Here, *either* State can alter the ability of the other to use the resource at issue.

The hearing also established that cones of depression from pumping cross other state borders. Most pertinently, the cone of depression caused by pumping in Shelby County, Tennessee, and DeSoto County, Mississippi, extends into Arkansas as well. Defs.' PFOF ¶ 122. The evidence also showed that, as of 2007, at least three other major cones of depression in the Middle Claiborne Aquifer crossed state borders: a cone of depression near Jackson, Mississippi, extending into Louisiana; a cone of depression near Stuttgart, Arkansas, extending into Mississippi; and overlapping cones of depression in Union County, Arkansas, and nearby Louisiana,

extending across the border between those two States. Defs.' PFOF ¶¶ 126, 128-130. All three of these cones of depression involve larger areas and steeper water-level declines than the cone of depression centered on Memphis. Defs.' PFOF ¶¶ 254-257. Such common cross-border effects throughout the eight-state Middle Claiborne Aquifer leave no doubt that it is an interstate resource.

Cross-border effects throughout the Aquifer also demonstrate why both the USGS and the Environmental Protection Agency recognize the importance of studying the Aquifer on a regional basis. Both agencies have recognized that earlier studies of the Middle Claiborne Aquifer often were less useful because they were (like Mississippi's legal theory here) artificially limited based on political boundaries. Defs.' PFOF ¶¶ 98-103. More recent studies, in contrast, attempt to account for the multi-state nature of the hydrogeological unit, including the cross-border effects of pumping. Defs.' PFOF ¶ 99. Indeed, the purpose of the USGS's Regional Aquifer-System Analysis Program – which produced the Arthur & Taylor paper cited by every expert in this case – was to improve on prior studies by creating *multi-state* models that could predict the regional effects of pumping. *See* Defs.' PFOF ¶ 145; J-4 at 5. These agencies' recognition of the importance of studying the Middle Claiborne Aquifer on a regional scale further underscores its interstate character.

C. Pre-Development Flow Patterns In The Aquifer Reinforce Its Interstate Character

1. The Special Master has noted that "the extent of historical flows in the Aquifer between Mississippi and Tennessee" could be relevant to whether the Aquifer and its water constitute an interstate resource. 2016 Op. 36. Pre-development flow further supports the conclusion that the Aquifer is an interstate resource because every study shows natural cross-border flow within the Aquifer from Mississippi into Tennessee. Defs.' PFOF ¶¶ 135-136. This confirms that the Aquifer underlies multiple States and that actions in one State may affect water in another; it also confirms that groundwater is analogous to surface waters that flow through multiple States. And the Special Master can rely on this fact without finding that any particular pre-development study is superior, because, as the hearing made clear, every expert agrees that at least some groundwater naturally flowed from Mississippi into Tennessee.

The experts testified about a number of pre-development potentiometric surface maps. Some of these maps resulted from computer models: the Brahana & Broshears model used by Mr. Wiley; the MERAS model used by Dr. Langseth and Mr. Wiley; and the Arthur & Taylor model. Defs.' PFOF ¶¶ 144-150. Other maps

were based directly on observed data: Reed (1972),[5] Criner & Parks (1976), and Dr. Waldron's recent study, Waldron & Larsen (2015). Defs.' PFOF ¶¶ 137-138, 142-143. All of these maps were similar in the most important ways: each showed pre-development flow across the border from Mississippi into Tennessee.[6] Defs.' PFOF ¶¶ 135-136. All of them also showed groundwater naturally flowing from Mississippi and from Tennessee into Arkansas, and across multiple other state borders. Defs.' PFOF ¶¶ 137-138, 143. Further, the larger-scale maps depict cross-border flow across at least one border of every State overlying the Aquifer. *See* J-4 at 64 (Plate 5); J-67; D-192 at 30.

All of the experts, including Mississippi's experts, agreed that there was natural flow within the Aquifer from Mississippi into Tennessee. Tr. 304:7-11, 507:17-508:6, 622:9-12, 858:3-6, 1015:3-11. As the Special Master already has noted, Mississippi's acknowledgement from the beginning that there was an area of natural flow from Mississippi into Tennessee "certainly do[es] not help Mississippi's argument." 2016 Op. 33. At the hearing, Mr. Wiley admitted that the materials Mississippi attached to its Complaint actually understated the area of natural flow

[5] Reed asserts in his description of his model that his depiction of the Aquifer's pre-development surface is based on observed data, but the source or nature of those data is unknown.

[6] Indeed, no expert could identify any study of the Aquifer that concluded that there was no cross-border flow from Mississippi into Tennessee under pre-development conditions. Defs.' PFOF ¶ 135.

from Mississippi into Tennessee – a depiction that Mr. Wiley agreed was more accurate showed cross-border flow along the majority of the DeSoto County-Shelby County border. Defs.' PFOF ¶ 141.

2. Although the exact volume and direction of pre-development flow in the Aquifer is not important to whether the Aquifer is an interstate resource, the most reliable map of pre-development conditions shows significantly more cross-border flow than those Mississippi cites. That map, developed by Drs. Waldron & Larsen, estimated that *more* water was crossing the border from Mississippi into Tennessee under natural conditions than was crossing the same border in 2007. Defs.' PFOF ¶ 154. Waldron & Larsen's conclusion not only reinforces the Aquifer's interstate character, but also undermines Mississippi's core theory that MLGW's pumping has increased the flow of water across the border.

That is fatal to Mississippi's position. The Waldron & Larsen paper estimated substantial natural flow from Mississippi into Tennessee – far more than Mississippi had previously acknowledged – and did so based on the single best re-creation of pre-development conditions in the Middle Claiborne Aquifer. Dr. Waldron testified at length why that is so, and Mississippi never once attempted to refute his explanation. Tr. 836:9-857:10, 876:3-10.

To draw an accurate and reliable contour map of an aquifer at a particular time, a hydrologist uses as many data points as possible (i.e., wells demonstrating

the aquifer's water levels at particular locations, or "control points") close in time to the depicted period (minimizing the distorting effects of changes over time). Defs.' PFOF ¶ 166. The primary previous effort to create a pre-development water-level map based on observed data, Criner & Parks (1976), used only four data points, dating between 40 and 70 years after the beginning of pumping in 1886. Defs.' PFOF ¶¶ 163, 165. Criner & Parks also used observations that were all taken more than 10 miles north of the Mississippi-Tennessee border, meaning that their contour lines near the state border were not based on nearby data. Defs.' PFOF ¶ 163; J-24 at 23. In particular, as Dr. Waldron testified without contradiction, Criner & Parks had no identifiable basis for a significant bend in their contour lines near the state border – a bend that made it appear (inaccurately) as though water was flowing parallel to the state border. Defs.' PFOF ¶ 164. And Dr. Waldron explained why the only other (apparent) attempt to map pre-development conditions based on observed data was not reliable: the Reed (1972) map of pre-development conditions gave no information whatsoever about what data it used. Defs.' PFOF ¶ 170.

The Waldron & Larsen paper was more reliable than these previous efforts because it had data that previous investigations lacked: three early USGS reports, dating to between 1903 and 1906, which compiled reported depths to water in wells in Tennessee, Mississippi, and Arkansas. Defs.' PFOF ¶ 158. These publications allowed Dr. Waldron to use 27 control points spread across nine counties, which also

were significantly closer in time to pre-development conditions. Defs.' PFOF ¶ 159. Dr. Waldron also was able to use multiple control points on both sides of the Tennessee-Mississippi border. D-194 at 28-29. And Dr. Waldron explained how he conducted an "error analysis" to ensure that any uncertainty created by his use of early data had a minimal effect on his conclusions. Tr. 855:1-857:3; Defs.' PFOF ¶ 161. Those facts together make the Waldron & Larsen map significantly more reliable than prior efforts to map pre-development water levels in the Middle Claiborne Aquifer.

The computer models discussed at the hearing, in contrast to Waldron & Larsen (2015), were developed as predictive tools to estimate the likely effects of future uses of the Aquifer, not to estimate historical conditions. Defs.' PFOF ¶ 171. Using historical observations is generally a more reliable method to estimate historical conditions than using a computer simulation. *Id.* Further, without historical observations from the relevant period, a computer modeler cannot calibrate the model to maximize its accuracy for that period. D-194 at 16. Thus, the Waldron & Larsen map provides a more reliable depiction of pre-development conditions than any of the computer models cited by the other experts.

The comparative reliability of the Waldron & Larsen map is important because it shows more substantial flow across the Mississippi-Tennessee border than previous studies. Comparing the paper's estimate of pre-development conditions

with a map of conditions in 2007, the Waldron & Larsen paper estimated that there was actually a *greater* volume of water flowing across the border before pumping began than in the modern era. Defs.' PFOF ¶ 154. If the Special Master finds that the exact volume of natural cross-border flow is relevant, then, the best estimate of that volume suggests that less water is flowing across the border into Tennessee now than under natural conditions. That conclusion leaves no doubt that the Middle Claiborne Aquifer is an interstate resource.

3. In any event, the Middle Claiborne Aquifer is an interstate water resource regardless of its pre-development flow patterns. As discussed, the Aquifer extends beneath multiple States, and pumping in one State can affect the availability of water in another State; that suffices to make the Aquifer an interstate resource. Neither of those critical facts depends on the direction, volume, or speed of groundwater flow under pre-development conditions. Thus, the Aquifer would be an interstate resource even if – contrary to the evidence – there were no interstate groundwater flow in the Aquifer under natural conditions.

Avoiding the need to determine precise pre-development flow patterns in the Aquifer has significant practical benefits, as well. As the evidence – and particularly the testimony of Dr. Waldron – made clear, developing an accurate picture of water levels in the Aquifer more than 130 years ago (before the commencement of pumping in 1886) is a complex and difficult undertaking. Even though Dr. Waldron

engaged in an "error analysis" to ensure that uncertainty could not have a material impact on his conclusions, he acknowledged that there is inherent uncertainty in any attempt to reconstruct historical conditions based on limited data. Defs.' PFOF ¶ 161; Tr. 855:6-10. The Special Master should not define an "interstate" aquifer in a way that requires fine calculations based on such conditions. But, if he does, the Middle Claiborne Aquifer would remain interstate based on the pervasive historical flows estimated by the Waldron & Larsen paper.

D. The Aquifer Is An Interstate Resource Because It Is Hydrologically Interconnected To Interstate Surface Water

The hydrological connections between the Middle Claiborne Aquifer and interstate surface water provide an independent basis to conclude that the Aquifer is an interstate resource. "[T]he Supreme Court has indicated that equitable-apportionment principles govern disputes between States over a body of interstate surface water with a groundwater component." 2016 Op. 20 (citing *Texas v. New Mexico*, 462 U.S. at 556-58 & n.2). The hearing established that the Middle Claiborne Aquifer is hydrologically interconnected to other interstate aquifers and interstate rivers.

Every expert testified that the Middle Claiborne Aquifer is part of a larger groundwater system called the Mississippi Embayment (or Mississippi Embayment Regional Aquifer System), which contains multiple aquifers separated vertically by confining layers. Defs.' PFOF ¶¶ 50-53, 186. These confining layers restrict but do

not eliminate the flow of groundwater between aquifers. Defs.' PFOF ¶¶ 11, 186. The Middle Claiborne Aquifer is separated by confining layers from the Fort Pillow Aquifer, below, and the surficial or shallow aquifer, above, and can exchange groundwater with those aquifers. Defs.' PFOF ¶¶ 188-189. The Fort Pillow Aquifer and the shallow aquifer themselves extend beneath multiple States, Defs.' PFOF ¶ 189; J-19 at 22; J-36 at 8, emphasizing the interstate character of the Middle Claiborne Aquifer.

More importantly, the Middle Claiborne Aquifer is hydrologically connected to interstate surface streams in the region. In areas where it outcrops, the Aquifer is connected directly to both the Wolf River (which flows from Mississippi into Tennessee) and the Mississippi River. Defs.' PFOF ¶¶ 178-184. The Middle Claiborne Aquifer also is connected indirectly to the Mississippi River through its hydrological connection to the shallow aquifer; under natural conditions, much of the groundwater in the Middle Claiborne Aquifer ultimately discharged into the Mississippi River. Defs.' PFOF ¶¶ 53, 183. As the Special Master has held, such surface-water connections provide an independent basis to conclude that the Aquifer is an interstate resource. 2018 Op. 19-20.

E. Mississippi's Attempts To Characterize The Aquifer As Intrastate Are Unpersuasive

At the hearing, Mississippi made virtually no attempt to show that the Middle Claiborne Aquifer is intrastate in nature. *See*, *e.g.*, Tr. 313:22-314:21 (Special

Master observing that Mississippi's lead expert "obviously doesn't have an opinion about whether it's interstate or not"). The sporadic arguments it did make are unpersuasive. Recognizing that every pre-development flow map shows water flowing across the border from Mississippi into Tennessee, Mississippi previously has attempted to limit its claim to water it alleges would have remained within Mississippi under natural conditions. *See*, *e.g.*, Pl.'s Opp. to MJOP 30 n.22; Pl.'s Resp. to SJ 14. The Supreme Court's equitable-apportionment case law provides no support for this distinction, which also fails on the merits.

The Special Master rightly concluded that Mississippi cannot prevail by claiming a portion of the water within the interstate Middle Claiborne Aquifer as a separate intrastate resource: "'no Supreme Court decision appears to have endorsed one State suing another State, without equitable apportionment, for the depletion of water that is part of a larger interstate resource by limiting its claims to a specific portion of the water.'" 2018 Op. 13 (quoting 2016 Op. 32). Instead, in *Kansas v. Colorado*, the Court considered an interstate river where the water periodically ran dry between the States. 206 U.S. at 115. The lack of permanent flow across the state boundary did not transform part of the river into an "intrastate" resource exempt from equitable apportionment. Instead, the Court considered the river as a whole. So too here. An aquifer, by definition, includes the groundwater within it. Defs.' PFOF ¶ 10. If "the water Mississippi claims is part of a larger interstate resource –

such as an interstate Aquifer – then the water is likely interstate in nature." 2018 Op. 14. The trial testimony confirmed the wisdom of that holding. Defs.' PFOF ¶¶ 9-10.

In any event, there is no "intrastate" water that would have remained within Mississippi absent pumping. Water within the Aquifer is and was constantly flowing, including from Mississippi into Tennessee and Arkansas. Defs.' PFOF ¶ 172. In fact, Mississippi's own expert estimated that every day approximately 37 million gallons of water within the Aquifer *naturally* flowed from Mississippi into other States. Defs.' PFOF ¶ 268. Every map of pre-development conditions demonstrates that all of the water in the Middle Claiborne Aquifer was on flow paths to leave Mississippi eventually, either by flowing into an adjoining State or by discharging from the Aquifer, for example, into an interstate river system. Defs.' PFOF ¶ 174. Further, the most reliable estimate of pre-development conditions in the Middle Claiborne Aquifer showed that the average volume of flow from Mississippi into Tennessee within the Middle Claiborne Aquifer in recent years was less than the average estimated flow under pre-development conditions. Defs.' PFOF ¶ 154. In other words, MLGW's pumping merely removes water from the Middle Claiborne Aquifer that would have flowed naturally into Tennessee anyway.

Nor is the long residence time of some of this water within Mississippi under natural conditions relevant to whether the Aquifer is interstate. All groundwater

moves slowly compared to surface water. In fact, even the water that Mississippi affirmatively admits is interstate because it would have flowed into Tennessee includes water at least six miles from the border, Tr. 305:14-17, which traveling in the most direct route possible at the proffered "inch per day," Defs.' PFOF ¶ 263, would have remained in Mississippi for more than 1,000 years. But water that Mississippi claims is *intrastate* would have left Mississippi to flow into Arkansas or the Mississippi River in a similar time frame. There is thus no principled way to distinguish between the admittedly interstate water and the allegedly intrastate water on the basis of residence time. The Special Master has properly concluded that, despite these slow velocities, equitable apportionment applies to groundwater. 2016 Op. 20.

III. MISSISSIPPI'S CLAIMS SHOULD BE DISMISSED WITH PREJUDICE BECAUSE IT HAS DISCLAIMED ITS ONLY REMEDY

"[I]n the absence of an interstate compact, the Court has authorized only one avenue for States to pursue a claim that another State has depleted the availability of interstate waters within its borders: equitable apportionment." 2016 Op. 35. But Mississippi expressly disclaimed equitable apportionment in its Complaint. *See* Compl. ¶ 38 ("This case does not fall within the Court's equitable apportionment jurisprudence."). Because Mississippi has disclaimed its only remedy – and because the evidence establishes that it would not be entitled to an apportionment in any

event – the Special Master should recommend the dismissal of its Complaint with prejudice.

A. Mississippi Purposefully Disclaimed Equitable Apportionment

Dismissal with prejudice is warranted because Mississippi's decision to disclaim equitable apportionment was not a pleading error; it was a strategic and necessary decision by Mississippi. First, it permitted Mississippi to avoid making the heightened showing of injury required in an equitable apportionment. Second, it allowed Mississippi to seek damages, which an equitable apportionment forecloses. Third, it enabled Mississippi to avoid an equitable balancing that could result in Mississippi receiving less water than it takes currently.

1. In an equitable apportionment, the plaintiff must show that it has suffered a "'threatened invasion of rights' that is 'of serious magnitude.'" *Florida v. Georgia*, 138 S. Ct. at 2514 (quoting *Washington v. Oregon*, 297 U.S. at 522). It must prove that injury by clear and convincing evidence. *See Idaho ex rel. Evans*, 462 U.S. at 1027. As the evidence at the hearing demonstrated, Mississippi cannot show any injury to its ability to use groundwater in the Middle Claiborne Aquifer, much less one "of serious magnitude."[7] Water levels in the Aquifer in the Memphis

[7] Mississippi ignored the Special Master's instruction to limit its evidence to the issue whether the Aquifer is interstate and presented significant evidence that was relevant only to the issue of damages. For the reasons explained in Part V, the Special Master should strike Mississippi's irrelevant evidence about damages because it is prejudicial to Defendants. However, even when permitted to present

area actually have increased in recent years. Defs.' PFOF ¶ 256; Tr. 456:9-19. And Memphis's pumping has not caused subsidence of the Aquifer or otherwise damaged it. Defs.' PFOF ¶¶ 247, 249. Water purveyors in Mississippi are meeting their demand for water from the Aquifer. Defs.' PFOF ¶ 240. Mississippi's own evidence showed that pumping in DeSoto County, Mississippi, has, without difficulty, increased in recent years to approximately 20 million gallons per day. Defs.' PFOF ¶ 231. There is no evidence that Mississippi has had any trouble withdrawing as much water as desired from the Aquifer. Defs.' PFOF ¶ 243.

Instead, Mississippi's expert hypothesized about theoretical, minor injuries. Mississippi claimed that drawdown from a cone of depression may increase the amount of electricity required to pump water from a well located within the cone of depression because pumps must lift the water higher, but made no attempt to quantify the potential cost. Defs.' PFOF ¶ 244. In fact, any such increased electricity cost would be much smaller than the damages sought in this case. *Id.* Drawdown from a cone of depression could require the user of a well located within the cone of depression to lower the location of the pump within the well, but Mississippi offered no evidence this has ever occurred. Defs.' PFOF ¶ 245. Pumping water from an aquifer also theoretically can cause water from other

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entirely one-sided evidence, Mississippi failed to demonstrate a substantial injury of the type necessary for an equitable apportionment.

aquifers to migrate into the pumped aquifer more quickly. If the water in adjoining aquifers is lower quality, this may damage water quality, but Mississippi's experts again offered no evidence of any degradation in water quality in well fields in Mississippi. Defs.' PFOF ¶ 246.

2. A successful claim for equitable apportionment results in a decree governing future use of the resource at issue – but not damages. "Equitable apportionment is directed at ameliorating present harm and preventing future injuries to the complaining State, not at compensating that State for prior injury." *Idaho ex rel. Evans*, 462 U.S. at 1028. By contrast, Mississippi's Complaint seeks at least $615 million in damages or, alternatively, disgorgement of "all profits, proceeds, consequential gains, saved expenditures, and other benefits" obtained by Defendants. Compl. ¶¶ 55-56. Disclaiming equitable apportionment has allowed Mississippi to seek a windfall.

3. In an equitable apportionment, the Court would consider all current uses of the Aquifer. Thus, the Court would consider Mississippi's own pumping both in the Memphis area and elsewhere, including a deeper, more extensive cone of depression caused by Mississippi's pumping near Jackson, Mississippi. Defs.' PFOF ¶¶ 256-257. *See Nebraska v. Wyoming*, 515 U.S. at 14 (concluding that pumping by the complaining State "could well affect the relief to which [it] is entitled"). It also would look at pumping by Arkansas and Louisiana, which likewise

have created deeper, more extensive cones of depression than that in the Memphis area. Defs.' PFOF ¶ 257. Here, by contrast, Mississippi seeks to focus the evidence on MLGW's conduct alone in an effort to make it appear to be a bad actor.

In an equitable apportionment, the Court also would consider the importance of "existing economies" and "established uses" of the Aquifer, *Colorado v. New Mexico*, 459 U.S. at 187, including Memphis's use of the Aquifer since 1886. Defs.' PFOF ¶ 131. It would study the enormous costs of minimizing or eliminating the extent of the cone of depression into Mississippi, which would require MLGW to move most of its wells outside of Shelby County and to construct hundreds of new wells and pipelines. Defs.' PFOF ¶ 252. And it would consider the relative importance of competing uses, looking to issues like Memphis's population compared to the surrounding areas. *See*, *e.g.*, *Kansas v. Colorado*, 206 U.S. at 108. Defs.' PFOF ¶ 258.

Mississippi has been increasing its pumping in the Memphis area, and – in the absence of an interstate compact or an equitable apportionment – it can continue to increase its pumping there and elsewhere. Defs.' PFOF ¶ 231. But following an equitable apportionment, Mississippi's rights to use the Aquifer would be limited, and it might well receive a smaller share than it currently uses. By disclaiming equitable apportionment, Mississippi avoided future limitations on its own rights, including the risk that it would end up worse off than it is today.

B. The Court Should Dismiss Mississippi's Complaint With Prejudice

Interstate groundwater, like interstate surface water, is subject to equitable apportionment. The evidence at the hearing conclusively established that the Middle Claiborne Aquifer is interstate. Because Mississippi has disclaimed an equitable apportionment and the Aquifer is not subject to an interstate compact, Mississippi's Complaint should be dismissed with prejudice. In fact, Mississippi has failed to show any injury from MLGW's pumping, much less one of sufficient magnitude to obtain an equitable apportionment. *See* discussion *supra* III.A.1.

When a party fails to demonstrate the requisite injury to obtain an equitable apportionment, the State must show changed circumstances in order to bring a new action. In *Kansas v. Colorado*, the Court dismissed the action without prejudice to Kansas's right to bring a new suit if there is "a material increase in the depletion of the waters . . . destroying the equitable apportionment." 206 U.S. at 117-18. More than 35 years later, the Court again dismissed Kansas's claims because Kansas could not demonstrate that "Colorado has, since our prior decision, increased depletion of the water supply to the material damage of Kansas' substantial interests." *Colorado v. Kansas*, 320 U.S. 383, 393, 400 (1943). *See also Idaho ex rel. Evans*, 462 U.S. at 1029 ("dismiss[ing] the action without prejudice to the right of Idaho to bring new proceedings whenever it shall appear that it is being deprived of its equitable share of anadromous fish"). Because Mississippi failed to establish any injury, and it

would prejudice Tennessee to face an equitable-apportionment claim after more than 12 years of litigation based on the opposite premise, Mississippi also should be precluded from bringing another action without showing changed circumstances.

IV. ISSUE PRECLUSION BARS MISSISSIPPI'S CLAIMS

Ordinary principles of issue preclusion bar Mississippi from re-litigating whether the Aquifer, which includes the water in it, is interstate and whether equitable apportionment is necessary. *See New Hampshire v. Maine*, 532 U.S. 742, 748-49 (2001). These principles apply equally in original-jurisdiction cases before the Supreme Court. *See Marrese v. American Acad. of Orthopaedic Surgeons*, 470 U.S. 373, 380 (1985); *Arizona v. California*, 530 U.S. 392, 413-18 (2000). Tennessee has explained that conclusion at length in prior briefing, *see* Tenn. MJOP 35-47, and the Special Master recognized that those arguments made the issue "close," 2016 Op. 28. Although Tennessee recognizes that the Special Master ultimately disagreed with its argument, Tennessee respectfully raises the point again here to preserve it for further review.

V. TENNESSEE'S EVIDENTIARY MOTIONS SHOULD BE GRANTED

A. Mississippi's Groundwater Management And Pumping Volume Evidence Is Irrelevant And Should Be Excluded

The Special Master restricted the evidentiary hearing to "the limited issue of whether the Aquifer is an interstate resource." 2016 Op. 36. Despite that clear limitation, Mississippi offered large amounts of evidence having virtually nothing

to do with the threshold issue whether the Aquifer is interstate. As Defendants explained in their motion in limine, Dkt. Nos. 81, 94, which Tennessee now renews, such irrelevant evidence should be excluded. *See* Fed. R. Evid. 402, 403. Admitting this evidence would defeat the efficiencies that the Special Master sought to achieve through phased litigation and would prejudice Defendants. Indeed, Defendants have relied throughout these proceedings on the Special Master's order restricting the scope of the hearing, which is why Defendants declined to develop evidence on irrelevant issues like damages. Mississippi's refusal to similarly hew to the Special Master's order unfairly seeks to paint Defendants as bad actors and distract from the actual question before the Special Master.

At the hearing, Mississippi presented evidence about well-field design generally and MLGW's groundwater management practices in particular. Defs.' PFOF ¶¶ 218-224. For example, Dr. Spruill opined about the location of MLGW's well fields and the possibility of overlapping cones of depression, vaguely insinuating that MLGW has mismanaged the Aquifer. Defs.' PFOF ¶ 220. Tennessee denies that Defendants engaged in any improper practices, and Defendants would be prepared to defend their actions if the issue ever became relevant. But such facts are not relevant to the hydrogeological question at issue because MLGW's groundwater management practices cannot change hydrogeological facts about the Aquifer.

The Special Master also should exclude all evidence of the volumes of water MLGW has withdrawn from the Aquifer and the volumes of water MLGW has supposedly diverted from Mississippi into Tennessee. Such evidence also is irrelevant to whether the Aquifer is interstate or so marginally probative that its relevance is substantially outweighed by the unfair prejudice to Defendants. For example, both of Mississippi's experts offered testimony about the volumes of water MLGW has withdrawn from the Aquifer over the last five decades, which has no bearing on whether the Aquifer is interstate. *See*, *e.g.*, Tr. 199:3-201:4. And Mr. Wiley testified about his attempts to calculate the volumes of water diverted from Mississippi into Tennessee. *See*, *e.g.*, Tr. 438:7-15, 451:3-21, 469:3-23. Although water's ability to flow from Mississippi into Tennessee is relevant to whether the Aquifer is interstate, *see* discussion *supra*, that basic fact is well-established. Allowing Mississippi to present evidence about alleged volumes serves no purpose but to prejudice Defendants, which hewed closely to the Special Master's order.

B. Dr. Spruill's Undisclosed Opinions Should Be Struck

Although the Federal Rules of Evidence generally serve as guides in original-jurisdiction proceedings, *see* Sup. Ct. R. 17.2, the Special Master's pre-hearing order specifically provided that Rules 26-37 and 45 of the Federal Rules of Civil Procedure

applied. CMP ¶ 4(b).[8] Rule 26(a)(2), which governs disclosure of expert testimony, requires that each expert witness provide a report that contains "a complete statement of all opinions the witness will express and the basis and reasons for them." Fed. R. Civ. P. 26(a)(2)(B)(i). The party must provide any supplemental disclosures at least 30 days before the hearing. Fed. R. Civ. P. 26(a)(3), 26(e)(2). Opinions that are not disclosed cannot be used "at a hearing . . . unless the failure was substantially justified or is harmless." Fed. R. Civ. P. 37(c)(1).

At the hearing, Dr. Spruill offered evidence about the location of MLGW's well fields, the volumes of pumping from these well fields, the distance these cones of depression would extend into Mississippi, and the availability of water elsewhere in Tennessee that was contained in neither his expert report nor any supplemental disclosure. For example, Dr. Spruill testified that there are areas of the Aquifer north of Memphis where MLGW could have placed wells, relying on a 1965 report by Gerald K. Moore, J-58. Putting aside this testimony's irrelevance to whether the Aquifer is interstate, Dr. Spruill's expert report contained no opinions about the availability of water elsewhere in the Middle Claiborne Aquifer and did not even cite the Moore study. Tr. 333:25-335:8.

[8] The Special Master's order excluded two subsections, Rule 26(a)(1) and Rule 26(f), which are not pertinent.

On another occasion, Dr. Spruill opined about the location of individual wells within MLGW's well fields and the distance to the Mississippi-Tennessee border. Tr. 191:18-193:12. Mississippi admitted that this evidence was not part of Dr. Spruill's expert report, claiming instead that Dr. Spruill had performed "continuing work on this case." Tr. 192:14-15. Mississippi did not – and cannot – establish that this failure to disclose was "substantially justified" or "harmless." Fed. R. Civ. P. 37(c)(1). Mississippi was under an obligation to disclose all of Dr. Spruill's opinions in his original expert report, and it has provided no justification for its failure to do so. Nor was it harmless: in defending Dr. Spruill's "continuing work," counsel for Mississippi claimed that it was necessary because it was "a matter of great importance." Tr. 192:15. Courts routinely strike undisclosed expert testimony in such circumstances. *See*, *e.g.*, *Estate of Rodriguez v. United States*, 722 F. App'x 409, 414 (6th Cir. 2018) (Siler, J.) (affirming decision to exclude evidence that was not timely disclosed under Rule 26(a)); *Rembrandt Vision Techs., L.P. v. Johnson & Johnson Vision Care, Inc.*, 725 F.3d 1377, 1382 (Fed. Cir. 2013) (affirming decision to strike additional information disclosed by expert for the first time on cross-examination at trial).

C. Defendants' Remaining Motions In Limine Should Be Granted

On November 2, 2018, Defendants also filed four additional motions in limine: (1) Defendants' Joint Motion in Limine To Preclude Mississippi from

Arguing That There Are Two Aquifers at Issue, Dkt. No. 78; (2) Defendants' Joint Motion To Exclude the Testimony of Dr. Richard Spruill, Dkt. No. 79; (3) Defendants' Joint Motion To Exclude the Testimony and Opinions of Mississippi's Expert David A. Wiley, Dkt. No. 77; and (4) Defendants' Joint Motion To Exclude Mississippi's Designated Deposition Testimony, Dkt. No. 80.[9] On December 7, 2018, Defendants filed joint replies in support of each of these motions. *See* Dkt. Nos. 95, 96, 97, 98. The Special Master took these motions under advisement and declined to decide them prior to trial. Tennessee now respectfully asks the Special Master to grant each of these motions and incorporates by reference Defendants' prior briefs on these matters.

CONCLUSION

The hearing demonstrated that this case involves an interstate resource. The Special Master should recommend that the Supreme Court dismiss Mississippi's claims with prejudice.

[9] Defendants also filed a Joint Motion in Limine To Exclude Plaintiff's Exhibits That Cannot Be Authenticated and/or for Which There Is No Foundation, *see* Dkt. No. 82, which they withdrew.

Respectfully submitted,

/s/ *David C. Frederick*

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September 19, 2019

CERTIFICATE OF SERVICE

Pursuant to Paragraph 3 of the Special Master's Case Management Plan (Dkt. No. 57), I hereby certify that all parties on the Special Master's approved service list (Dkt. No. 26) have been served by electronic mail, this 19th day of September 2019.

/s/ *David C. Frederick*

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