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.

STATE OF MISSISSIPPI'S POST-HEARING BRIEF

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I. INTRODUCTION

This case presents a dispute between Mississippi and Tennessee over one of the Earth's most important natural resources: groundwater found beneath the surface of the earth in locally diverse geologic settings which dictate its availability, quality, costs of production, and the terms on which it can be regulated and produced as a sustainable natural resource. J-2, pages 8-10 of 86. The record establishes that Memphis/MLGW, with the complicity of Tennessee, intentionally expanded the geographic footprint of MLGW's massive groundwater pumping business to within two to three miles of the Mississippi border to pump billions of gallons of groundwater out of Mississippi into Tennessee.

Defendants' actions are a direct violation of Mississippi's territorial sovereignty over all waters found *in situ* within its borders and constitute an unlawful taking of Mississippi's natural resources. Mississippi brings this lawsuit in its sovereign capacity, and acting *parens patriae* to *protect,* preserve, regulate and control the State's natural resources held in trust for the benefit of its citizens. The case *does not* involve any federal law or any commercial activity implicating the Commerce Clause of the Constitution.

Defendants have not cited any law authorizing them to capture, through pumping, water that is present *in situ* within Mississippi and subject to Mississippi's exclusive dominion and control. Instead they insist that the Supreme Court case law

creating an equitable remedy for resolution of disputes between States over interstate river water authorizes their taking of Mississippi groundwater. But Defendants' arguments in support of their position consist of nothing but false analogies and generalizations which seek success by confusion and misdirection. Equitable apportionment does not create any rights--it is an equitable remedy created to protect a specific equitable interest--and false analogies between surface water and groundwater are insufficient to create the substantive rights Defendants claim. Likewise, no legal authority exists to support Defendants' assertion that Mississippi has the burden of proving that the groundwater Tennessee has pumped out of Mississippi would have otherwise remained in Mississippi *forever* to prevail.[1]

This case must be decided in the context of the respective rights and duties of co-equal sovereigns under the Constitution and applied geologic and hydrogeologic science, not an exercise in sophistry seeking endorsement of a modern form of economic warfare prohibited by the Constitution. The Special Master should recommend that the Court enter judgment for Mississippi on the limited issue identified for the evidentiary hearing and seek direction for the next step in these proceedings.

[1] Tr. 24:21 to 25:3 (Mississippi groundwater "velocity and movement and residence time … [are] irrelevant … because [Mississippi] … cannot prove that Tennessee has somehow gotten water that would have stayed in Mississippi *forever*" (emphasis added).

II. THE LIMITED ISSUE FOR THE HEARING

The question presented for the evidentiary hearing in the Special Master's August 12, 2016, Order is "[w]hether *the water* that is *at issue* in this case is *interstate in nature*." Dkt. 56 (emphases added). This question properly focuses on the legal interests claimed by each State to the groundwater in dispute which has been pumped out of Mississippi by MLGW; however, the use of the phrase "interstate in nature," is problematic because it implies some application of the Interstate Commerce Clause which does not exist in this case, and does not bring any potentially relevant factors to be used in making such a determination. *Cf.*, *Entergy Corp. v. Riverkeeper, Inc.*, 556 U.S. 208, 222 (2009) (absence of potentially relevant factors in federal law made determination of meaning of silence on issue impossible). This phrase is only found in six Supreme Court cases[2] which are not remotely related to natural resources residing *in situ* within a State's territorial borders, and as Tennessee's expert admitted during the hearing, the phrase

[2] *See Milwaukee v. Illinois and Michigan*, 451 U.S. 304 (1981) (Federal Water Pollution Act controls interstate surface water pollution dispute); *Merrill Lynch, Pierce, Fenner & Smith, Inc. v. Ware*, 414 U.S. 117 (1973) (employment dispute over arbitration clause enforceability under State law); *General Motors Corp. v. Washington*, 377 U.S. 436 (1964) (tax on vehicles and parts sold in Washington, but manufactured in other states upheld); *Toolson v. New York Yankees, Inc.*, 346 U.S. 356 (1953) (interstate business of professional baseball clubs not subject to antitrust laws); *Norton Co. v. Dept. of Rev.*, 340 U.S. 534 (1951) (Illinois Occupation Tax on sales of goods in Chicago by branch of Massachusetts upheld); *Independent Warehouses v. Scheele*, 331 U.S. 70 (1947) (town license tax on warehouse used to store coal in transit by Pennsylvania Coal Company upheld).

"interstate aquifer" relied on by Defendants, has never been defined in the scientific literature. Tr. (Waldron) 902.

The phrases proffered by Defendants are grounded in ambiguity and false analogies. Regardless of the label placed on it, *all* groundwater in Mississippi is under Mississippi's exclusive authority and control. Defendants' pumping of groundwater out of Mississippi into Tennessee without Mississippi's permission is an unlawful taking and violation of Mississippi's territorial sovereignty.

III. SURFACE WATER – GROUNDWATER DISTINCTIONS

Defendants' argument that Supreme Court equitable apportionment case law controls this case assumes an equivalence between surface water and groundwater in the context of Constitution analysis that does not exist. The following high-level summary provides a starting point for this discussion:

> *Surface water* occurs in readily discernible drainage basins. The boundaries are topographic and may be easily delineated on a topographic map. The water conveniently flows in the direction in which the land surface is sloping. Moreover, surface water does not cross topographic divides (except, perhaps, during floods) and the locations of the drainage divides are fixed.
>
> *Groundwater, on the other hand,* occurs in aquifers that are hidden from view. The boundaries of an aquifer are physical: it can crop out, abut an impermeable rock unit, grade into a lower permeability deposit, or thin and disappear. At a given location, the land surface may be underlain by several aquifers. Each aquifer may have different chemical makeup and different hydraulic potential; each may be recharged in a different location and flow in a different direction. Moreover, groundwater divides do not necessarily coincide with surface-water divides.

J-27 at 441-442 (italics added and reformatted for clarity). Additional distinctions are discussed at J-2, pages 8, 10, 13, 15-16 of 86; J-40, pages 6-10, 30 of 91; and J-68, pages 9, 11-14 of 79. Groundwater does not "flow" like a "body of water" in an interstate river moving downstream at velocities measured in feet per second roughly equating 16 miles a day. J-2, page 13 of 86. Groundwater creeps through cracks or between and around the rocks and soils of the earth moving at typical rates measured in meters a year, (J-40, page 10 of 90), and can remain in the earth for periods of times ranging from days to tens of thousands of years depending on the specific geology and location in the three-dimensional subsurface environment. J-2, page 16 of 86; J-29, page 23 of 624; J-40, page 19 of 91. The groundwater constitutes part of the subterranean structure of Mississippi, and therefore part of its sovereign territory.

An understanding of how some other core terminology used by Defendants is misleading is demonstrated by another quote:

> Of all the words in the hydrologic vocabulary, there is probably none with more shades of meaning than the term *aquifer*. It means different things to different people, and perhaps different things to the same person at different times. It is used to refer to individual geologic layers, to complete geologic formations, and even to groups of geologic formations. The term must always be viewed in terms of the scale and context of usage.

J-29, page 65 of 624.

The phrase "interstate aquifer" not only lacks any scientific meaning, it is useless as a legal designation and communicates both false equivalence and legal implications that do not exist.

IV. THE WATER AT ISSUE

A. Identification of the Water at Issue.

The water at issue in this case is groundwater located in northwest Mississippi, hundreds of feet below the surface in pore spaces or fractures that exist between and around naturally occurring materials. Tr. 47-49; J-40, page 90 of 91. The naturally occurring materials constituting the northwest Mississippi subsurface are extremely small grains of unconsolidated materials, including varying compositions of clay, silt, sand, and, in some locations, gravel. Tr. 49-52.[3] The water at issue is not part of (nor like) an underground lake or underground stream flowing in a defined channel. Tr. 386; P-73. Instead, it is found as very small amounts of water located in the tiny pore spaces that exist between and around tiny grains of sand and other unconsolidated materials in the subsurface of northwest Mississippi. Tr. 52, 386.

Most of the water at issue is located in a geologic formation identified by geologists as the "Sparta Sand," while some water (at or just south of the Mississippi-

[3] "Clay" refers to any naturally occurring material that is less than 1/256th of a millimeter in "grain size." "Silt" refers to material that is between 1/256th of a millimeter and 1/16th of a millimeter. "Sand" refers to any material that is between 1/16th of a millimeter and 2 millimeters. "Gravel" refers to material larger than 2 millimeters. Tr. 49-51.
These terms—clay, silt, sand, and gravel—are used exclusively by geologists to indicate that the particles are not stuck together, i.e., they are *unconsolidated* materials. Tr. 51.

Tennessee border) may be located in a geologic formation identified by geologists as the "Memphis Sand." Tr. 81, 94, 244. These formations are comprised predominantly of sand of varying grain sizes and irregular shapes, interspersed with varying compositions of clay and silt. Tr. 50, 52.

Mississippi does not claim that this groundwater would have remained in Mississippi *forever* absent MLGW pumping, or that it is stationary, but its movement—dictated by gravity and pressure—is extremely slow. Tr. 77, 405. Under natural conditions, the groundwater creeps westward from outcrops in Mississippi between and around grains of material at an average rate of one or two inches per day. Tr. 121-22, 405. At one inch a day, a molecule of the water at issue moves only thirty feet in a year, one mile in 175 years. Tr. 121, 458. The water has been located in Mississippi (or the territory that became Mississippi) for hundreds and thousands of years. Tr. 450. Groundwater is, therefore, part of the subterranean structure.

This is not a case about an "interstate aquifer" requiring apportionment. It is a case about State sovereignty over a natural resource found in the soils of Mississippi, in a groundwater system created by nature to collect, store, and maintain an essentially constant volume of groundwater in Mississippi for hundreds to thousands of years in a condition of equilibrium. The fact that groundwater eventually leaves Mississippi under natural conditions as it is replaced by natural recharge in Mississippi is irrelevant for the purposes of territorial sovereignty. Tr.

466. Such "eventualities" spanning hundreds and thousands of years have absolutely no legal or practical significance. (The sun will "eventually" burn out.). Regardless of the direction of groundwater movement after water seeps into the earth at Mississippi outcrops, it is part and parcel of Mississippi's sovereign territory until the forces of nature move it out of Mississippi groundwater pumping is not a force of nature, it is a force disrupting nature.

B. The Water at Issue is Intrastate Water Based on the Plain and Ordinary Meaning of the Term "Intrastate."

The water at issue is located, exists, and occurs in Mississippi, rendering it "intrastate" water according to the plain and ordinary meaning of the term. *AT&T Communications v. Mountain States, Inc*., 778 P.2d 677, 683 (Colo. 1989) ("plain and ordinary meaning" of "intrastate" is "existing within a state") *quoting Merriam-Webster's Collegiate Dictionary* 1186 (1986); *Florida Dept. of Revenue v. New Sea Escape Cruises, Ltd*., 894 So.2d 954, 961 (Fla. 2005) ("the term "intrastate" is commonly construed as meaning "existing or occurring within a state") *citing Merriam-Webster's Collegiate Dictionary* 614 (10th ed. 1999).

C. The Water at Issue is Intrastate Water as a Matter of Law.

The question of whether the water at issue is "intrastate" or "interstate" is a mixed question of law and fact. Defendants claim the water is a "shared" interstate resource because it is located in a geologic formation that spans multiple states and Defendants can capture the water through pumping. This contention totally ignores

the *legal* rights to the water. The water not a shared resource; the water is under Mississippi's *exclusive* dominion and control and Defendants, therefore, have *no lawful right to capture it* absent Mississippi's permission.

When Mississippi was admitted to the Union, it thereupon became vested with ownership, control, and dominion over the land and waters within its territorial boundaries. U.S. Const. art. IV, § 3, cl. 1; *Phillips Petroleum Co. v. Mississippi*, 484 U.S. 469, 479 (1988); *Oregon ex rel. State Land Bd v. Corvallis Sand & Gravel Co.*, 429 U.S. 363, 370-78 (1977); *Illinois Cent. R.R. Co. v. Illinois*, 146 U.S. 387, 452 (1892); *Pollard v. Hagan*, 44 U.S. 212, 222-23 (1845); *Martin v. Waddell's Lessee*, 41 U.S. 367 (1842). *See also Montana v. United States*, 450 U.S. 544, 551-52 (1981); *Idaho v. Coeur d'Alene Tribe*, 521 U.S. 261, 286-87 (1997).

Mississippi is sovereign over all matters not ceded to the federal government under the Constitution of the United States. U.S. Const. art. IV, § 3, cl. 1; U.S. Const. amend. X. It holds all right, title, and interest in and lawfully possesses full jurisdiction over the lands within its borders, including the beds of streams and other waters. *Rhode Island v. Massachusetts*, 37 U.S. 657, 733-35, 737-40 (1838).

The Mississippi Supreme Court affirmed the State's ownership and plenary authority over its water resources, including subterranean resources, in *Cinque Bambini P'ship v. Mississippi*, 491 So.2d 508, 511-14, 516-17 & 519-20 (1986), affirmed by this Court in *Phillips Petroleum Co. v. Mississippi*, 484 U.S. 469 (1988).

The *Cinque Bambini* Court recognized that, once Mississippi had been admitted to the Union and the public trust had been created and funded, the role of the equal footing doctrine ended and the title to and plenary authority over the lands and resources conveyed in trust became vested in the State. 491 So.2d at 512-13.

Ever since the federal sovereign ceded title to Mississippi, state law has controlled ownership and allocation of the use of natural resources located within its borders. *Oregon ex rel. State Land Bd.*, 429 U.S. at 378-82; *Cinque Bambini P'ship*, 491 So.2d at 513, 516-19. It is, thus, the State's prerogative to control and preserve these resources. *Id.* at 513, 517. *See also PPL Mont., LLC v. Montana*, 132 S. Ct. 1215, 1235 (2012) (finding that "[u]nder accepted principals of federalism, the States retain residual power to determine the scope of the public trust over waters within their borders.").

Mississippi's authority under the Constitution to preserve, control, and protect groundwater located within its borders is an "essential attribute of sovereignty." *United States v. Alaska*, 521 U.S. 1, 5 (1997). *See also Rapanos v United States*, 547 U.S. 715, 738 (2006) (state control of water within its borders is "quintessential" exercise of state power). This authority is also *exclusive*, subject only to limitations imposed by the Constitution or other federal law. *Tarrant Regional Water Dist. v. Herrman*, 568 U.S. 614, 632 n. 11 (2013). *These fundamental legal propositions render the water at issue "intrastate in nature" as a matter of law.*

Exercising its authority under the United States Constitution to regulate, protect, preserve, and control water located within its territorial borders, Mississippi has declared that all water in Mississippi, including the water at issue, is "among the basic resources of this State [and belongs] to the people of this State," and further declared that "the control and development and use of [this] water for all beneficial purposes shall be in the State, which, in the exercise of its police powers, shall take such measures to effectively and efficiently manage, protect, and utilize the water resources of Mississippi." Miss. Code Ann. § 51-3-1 (2003).

Pursuant to its public trust duties, Mississippi has promulgated statutes and administrative regulations controlling the withdrawal and use of Mississippi groundwater, (P-3 to P-5), and actively regulates groundwater withdrawals. *See, e.g.*, P-75; P-79; P-76; P-78; P-80 to P-84; and P-86 to P-88.

Tennessee's statement of its public trust sovereignty over groundwater within Tennessee mirrors Mississippi's. Tennessee law provides "that the waters of the state are the property of the state and are held in public trust for the benefit of its citizens." Tenn. Code Ann. § 68-221-702 (2013). This statute is Tennessee's binding recognition that groundwater located underneath Shelby County in the Memphis

Sand is *not* a shared interstate resource, but is intrastate in nature, the property of Tennessee, and held in trust for the benefit of its citizens.[4]

Tennessee cannot have it both ways. The question of whether the water at issue is a "shared interstate resource" has been answered definitively by both Mississippi and Tennessee. Based on their respective pronouncements, groundwater located in Mississippi is intrastate water owned by and subject to the exclusive dominion and control of Mississippi; and groundwater located in Tennessee is intrastate water owned by and subject to the exclusive dominion and control of Tennessee.

Some groundwater in Mississippi will "eventually" move/creep from Mississippi into Tennessee under natural conditions. Tr. 304. When that groundwater arrives in Tennessee, it will then be the property of Tennessee under § 68-221-702 and subject to Tennessee's exclusive dominion and control. But until water stored in Mississippi leaves Mississippi under natural conditions, it is under *Mississippi's* exclusive control in accordance with the Constitution, Miss. Code

[4] Defendants have apparently not considered the long-term implications of the position they are advocating, should "the shoe be on the other foot." Defendants' position means that the groundwater underneath Shelby County is not the property of Tennessee and is not held by Tennessee in trust for the benefit of its citizens. Instead, the valuable, high-quality groundwater under Shelby County is a shared interstate resource; and Mississippi is free to place multiple wells within Mississippi, five to ten feet from the Tennessee border, and capture massive volumes of groundwater underlying Shelby County, and continue to do so until the aquifer has been substantially harmed and Tennessee convinces the United States Supreme Court to equitably apportion the aquifer.

Ann. § 51-3-1, and the public trust doctrine. The water at issue was located in Mississippi until MLGW forcibly and artificially drew it into Tennessee without Mississippi's permission. MLGW is simply stealing groundwater held in trust by Mississippi.

V. MLGW'S TAKING OF MISSISSIPPI WATER WAS INTENTIONAL

MLGW sells water, gas, and electricity to customers in the Memphis area. S10. All the water MLGW sells to its customers is groundwater pumped by MLGW from the Memphis Sand, utilizing large commercial turbine pumps. Tr. 73, 189; P-51, pages 5, 13 of 140; P-52; P-94. MLGW's system consists of more than 160 wells in 10 well fields: Allen, Davis, Lichterman, LNG, Mallory, McCord, Morton, Palmer, Shaw, and Sheahan. S11; S13.

The amount of water MLGW has produced from these well fields is massive: 2.446 *trillion* gallons from 1965-2016. S*ee* P-157, page 2 of 2; J-60, page 28 of 40; P-52. Memphis does not, of course, have to rely solely on groundwater, as the "Mississippi River passes by its 'doorstep' carrying tremendous volumes of water to the Gulf of Mexico daily." J-60, pages 32-33 of 40. Memphis likewise has the ability to obtain groundwater from areas in Tennessee to the north of Memphis without taking groundwater from Mississippi. *See* J-63, page 6 of 36 ("The Memphis aquifer has much potential for future uses, particularly at places outside the Memphis area.").

MLGW determined the locations for all its wells. Although all of its well fields are located in Shelby County, (S11; Tr. 186), MLGW placed wells in very close proximity to Mississippi. The southern boundary of Shelby County is located on the Tennessee-Mississippi border and adjoins the northern boundary of Desoto County, Mississippi, and the northwestern boundary of Marshall County, Mississippi. S12. The Palmer wells are approximately three-quarters (3/4ths) of a mile from the Mississippi border; the Davis wells are approximately two miles from the border; and the Lichterman wells are approximately two to four miles from the border. Tr. 19; S14. *See also* J-49, page 5 of 27, figure 1 (well field locations); P-54 to P-57. The Lichterman field began operations in 1965; the Davis field in 1970; and the Palmer field in 1973. *See* P-157, page 2 of 2.

The removal of groundwater through pumping establishes hydraulic gradients that induce the flow of water into the well from areas surrounding the well, reducing water levels and creating a "cone of depression." J-40, page 33 of 91; Tr. 149-150. Pumping pulls groundwater within the area of the cone of depression into the well. Brahana Dep. at 43; Tr. 149-150, 205, 208-209. MLGW placed the Lichterman, Davis, and Palmer wells right next to the Mississippi border with the full knowledge and apparent intention that those wells would capture and produce substantial volumes of Mississippi groundwater, as shown by J-22, J-58, and J-59.

Exhibit J-22, entitled *Hydrology of Aquifer Systems in the Memphis Area, Tennessee*, USGS Water-Supply Paper 1779-O, was prepared in cooperation with the City of Memphis and MLGW. J-22, page 1 of 69. This 1964 report was based on pumping data for 1960, *prior to MLGW's installation and operation of the Lichterman, Davis, and Palmer well fields*. The report concluded—and advised MLGW—that the heavy pumping of groundwater in Shelby County, including by MLGW, from the "500-foot sand" (a/k/a the Memphis Sand) had created large (aerially) and very steep/deep cones of depression that extended into adjoining states, including Mississippi, and that this heavy pumping by MLGW and others was inducing the flow of water from Mississippi into the Memphis area, where the water from Mississippi was captured and produced by MLGW and others. J-22, page 9 of 69.

Exhibit J-58, entitled *Geology and Hydrology of the Claiborne Group in Western Tennessee,* USGS Water-Supply Paper 1809-F, is a 1965 USGS report prepared in cooperation with the Tennessee Department of Conservation. J-58, page 1 of 58. Building on the 1964 report in J-22, the 1965 USGS report concluded—and advised the State of Tennessee—that: "Under conditions of heavy pumping in Memphis, 25 mgd [million gallons per day] has been diverted into Shelby County as underflow through the "500-foot" sand from Mississippi. . . ." J-58, pages 34-35

of 58.[5] *The USGS concluded that future increases in pumping in the Memphis area would increase the amount of water being captured from Mississippi*. J-58, pages 46-47 and 49 of 58.

The third USGS report, J-59, *Predicted Hydrologic Effects of Pumping from the Lichterman Well Field in the Memphis Area, Tennessee*, USGS Water-Supply Paper 1819-B, published in 1965, was also prepared in cooperation with the City of Memphis and MLGW. J-59, page 1 of 32. That report predicted the hydrologic effects of pumping from the Lichterman Field, which was "scheduled to go into operation early in 1965 to supplement the municipal water-supply system for the City of Memphis, Tenn." J-59, page 6 of 32. The report concluded—and advised MLGW—that: "Pumping in the Lichterman well field will create a cone of depression in the free-water (piezometric) surface of the '500-foot' sand. The decline of water levels will be directly proportional to the rate of pumping and inversely proportional to the distance from the well field. The resultant changes in hydraulic gradients will alter the direction of ground-water movement in the vicinity of the well field and increase the rate of movement toward the well field from areas of recharge." J-59, page 6 of 32.

[5] Of the 135 mgd pumped in 1960 from the 500-foot sand in Shelby County, MLGW accounted for 58.54 mgd. J-58, page 42 of 58. *See also*, P-68 (City of Memphis memorandum from 2000 suggesting 20 to 40 million gallons per day were being taken from Mississippi).

The report concluded that "an estimate of 20 miles is considered reasonable for the probable extent of the cone of depression to be formed around the Lichterman well field." J-59, page 19 of 32. Since the Lichterman Field is approximately three miles from Mississippi, (S14; Tr. 191), MLGW *knew* that the cone of depression formed by MLGW's operation of Lichterman would likely extend approximately *17 miles into Mississippi.*

Defendants knew that future increases in pumping in the Memphis area would *increase* the amount of water being captured from Mississippi. J-58, pages 46-47 and 49 of 58. Nevertheless, MLGW *increased* its pumping.

MLGW began operating the Lichterman wells in 1965, the Davis wells in 1970, and the Palmer wells in 1973; and increased its total Memphis Sand pumping from 55.5 Mgd in 1960 to 110.5 Mgd in 1975, basically *doubling* its production. J-24, page 46 of 54. Primarily because of MLGW's increased pumping, total Shelby County pumping from the Memphis Sand by major water users increased from 127 Mgd in 1960 to 188 Mgd in 1975. *Id*. Notably, most of MLGW's increase was attributable to the Lichterman and Davis well fields. *See* P-157, page 2 of 2; J-24, page 46 of 54.

Despite USGS's warnings, MLGW located three fields right next to the border, increased its pumping substantially, and produced *666.8 billion* gallons of groundwater from these three fields during the period of 1965-2016. *See* P-157, page

2 of 2. Of this total, approximately 369 billion gallons was from Lichterman, 240 billion was from Davis, and 58 billion was from Palmer. *See id*.

MLGW's pumping of substantial volumes of groundwater from Mississippi is undeniable. And in light of USGS's warnings, one can only conclude that MLGW's extraction of groundwater from Mississippi was *intentional*.

VI. MLGW'S ACTIONS HAVE CAUSED SUBSTANTIAL HARM TO MISSISSIPPI

There is no dispute that MLGW's pumping has, in fact, created a large, deep regional cone of depression that extends many miles into Mississippi.[6] The cone of depression extends into DeSoto County. Brahana Dep. 122:18-22; Gentry Dep. 53:13-54:7.[7] During the 1970's MLGW's increased pumping caused the regional cone of depression to deepen and expand throughout the area around Memphis, (J-24, page 22 of 54), and the USGS reported "noticeable changes by 1970" with the

[6] J-11, page 13 of 27; J-24, page 9 of 54; J-33, page 1 of 1; J-34, page 6 of 26; J-35, page 23 of 52; J-48, page 1 of 1; J-50, page 1 of 1; J-60, page 29 of 40; J-62, page 5 of 13; J-63, page 12 of 36; J-64, pages 32-33 of 48; J-67, page 1 of 1; J-76, page 21 of 192; P-72, page 4 of 4; Tr. 429, 434, 442, 448-50, 453-54; Tr. 188, 205-06; Brahana Dep. at 45, 122; Gentry Dep. at 53. *See generally*, Brahana Dep. Designated testimony and exhibits including P-114 to 139.

[7] *See also*, P-101, page 14 of 44 ("The city of Memphis, through Memphis Light, Gas and Water (MLGW), is one of the largest cities in the world to rely solely on groundwater for its water supply. The city's wells tap into the Memphis Sand Aquifer, an underground reservoir that underlies nearly 7,400 square miles in West Tennessee, Northern Mississippi, Southwestern Kentucky, and Eastern Arkansas. The largest user of the aquifer, MLGW pumped an average of 208 million gallons per day in 1995, with an estimated 20 to 40 million gallons per day thought to be coming from beneath DeSoto County, Mississippi.")

development of cones from the Lichterman and Davis well fields which added to the regional cone of depression. J-24, page 29 of 54.

There is also no dispute that MLGW's pumping is pulling Mississippi groundwater into Shelby County for production by MLGW. Tr. (Waldron) 928 (admission by Tennessee expert witness that water located in Mississippi is being pulled into Tennessee by MLGW pumping).[8] Defendants knew this was happening, yet they continued to pump millions of gallons of groundwater from Mississippi. *See* P-61 and P-62 (2003 Scanner Reports); P-63 and P-64 (2007 Scanner Report); P-64 to P-70 (Memphis' internal discussions of reports of groundwater being taken from Mississippi); P-71 (USGS studies showed that there was "little doubt" that water was coming from Mississippi).[9] *See also* Tr. (Wiley) 397-487; 551-555.

Although the precise amount taken by MLGW from Mississippi is not at issue at this stage of the proceedings, it is undisputed that the volumes are substantial. Plaintiff's expert David Wiley has estimated that the amount of groundwater taken by MLGW from Mississippi from 1965 through 2016 was approximately 21.7 million gallons per day, for an approximate total of 411 *billion* gallons. Tr. 468 and 481; P-159. In 1998, *The Commercial Appeal* similarly reported that groundwater pumping in Shelby County was taking approximately 20 million gallons of water

[8] *See generally,* P-71; P-94; P-101; P-142; Gentry Dep. Designated testimony and exhibits, including P-143 to 149; P-152; P-154; P-156

[9] See also, P-96, page 4 of 10 ("specific water rights unclear"); P-97-100; P-106-109.

per day from Mississippi, an amount determined by Randy Gentry (of the Memphis Groundwater Institute) to be a reasonable estimate. Gentry Dep. at 35.

Mississippi's claims, however, are not just about the volumes of groundwater MLGW has taken from Mississippi. The cones of depression created by MLGW have caused material, adverse physical changes to Mississippi's sovereign territory, including adverse changes to the hydrogeologic conditions existing in northwest Mississippi. *See* J-76, page 21 of 192 ("Withdrawals in Shelby County have caused a major cone of depression and reorientation of aquifer gradients in adjacent counties."); J-4, page 10 of 68 ("Ground-water development in the Memphis area changed the direction of net horizontal flow east of the Mississippi River near the 35th parallel from southward before development to a northward flow."); J-10, page 26 of 80 ("From 1886 to 1975 pumpage at Memphis had drawn down the original potentiometric surface by as much as 150 feet in the major pumping center and reversed the original gradient, which was to the west (Criner and Parks, 1976). Flow that moved through the area toward natural discharge points to the south and west before 1886 is now diverted and captured by pumpage at Memphis."); Brahana Dep. 136-137 (cone of depression has altered the natural flow path of groundwater in Mississippi). In effect, MLGW has invaded and trespassed upon Mississippi's sovereign territory, and the Court should, at a minimum, enjoin MLGW's actions.

Significantly, the cone of depression created by MLGW has also damaged Mississippi and its citizens by materially and adversely impacting their ability to withdraw water from the Sparta Sand. MLGW's cone of depression has caused a reduction of "total available drawdown" within the cone's area/zone of influence. Tr. 210, 274-275. This reduction of total available drawdown interferes with the operation of and has had material adverse effects on each well located in Mississippi within the cone of depression created by MLGW. The "maximum yield" of each such Mississippi well has been reduced and the amount of water the well can recover has thereby been reduced, which means that more wells and more pumps--at great expense--are required to recover the water needs of Mississippi's producers; power costs of those producers have also been increased. Tr. 153, 212-14; J-40, pages 50, 68 and 81 of 91. The doctrine of equitable apportionment certainly has no application and cannot serve as an obstacle to Mississippi's pursuit of such claims.

VII. MLGW'S TAKING OF MISSISSIPPI GROUNDWATER WAS AVOIDABLE

MLGW's capture and withdrawal of water from Mississippi was not only intentional, it was avoidable. The amount of groundwater MLGW needs for its operations has always been available within Tennessee's borders, and could have been procured by MLGW without the taking of *any* groundwater from Mississippi.

Aside from the fact that MLGW could have obtained all of the water it would ever need from the Mississippi River, *see* J-60, page 33 of 40, the massive, extremely

thick Memphis Sand covers the entirety of western Tennessee, extending continuously from the Tennessee-Mississippi border to the Tennessee-Kentucky border. *See* J-63, page 6 of 36 ("The Memphis Sand of the Claiborne Group of Tertiary age underlies approximately 7,400 square miles in western Tennessee."); J-63, page 8 of 36 (showing the "area of occurrence" of the Memphis Sand in western Tennessee); J-63, page 11 of 36 (showing thickness of Memphis Sand from Memphis to Kentucky border). MLGW could have placed well fields at locations to the north and east of Memphis, tapped into the enormous Memphis Sand water resources available throughout western Tennessee, and captured all the water it needed without taking groundwater from Mississippi. *See* J-4, page 49 of 68 ("The middle Claiborne aquifer has potential for increased development of large ground-water supplies away from areas already being heavily pumped in the northern area (north of the transition zone in the lower Claiborne confining unit)."); J-63, page 6 of 36 ("The Memphis aquifer has much potential for future uses, particularly at places outside the Memphis area."). *See also* Tr. 937-38 (Waldron admitted that there is a significant amount of high-quality groundwater north of Memphis.).

MLGW had control over the design and operation of its well fields. P-103 (well field design map). Before drilling a well, it could predict the extent and depth of a resulting cone of depression. Tr. 934-37. Strategic well spacing can be implemented to mitigate the effects (areal extent and depth) of cones of depression.

Tr. 76-81, 197-98, 251-54. MLGW could have placed its wells further north and avoided the impact on Mississippi. Tr. 219. Operators can also mitigate these effects through strategic operations, such as shutting down wells for periods of time, thereby contracting/shrinking the cones. Tr. 256.

VIII. THE COURT MUST DECIDE THIS CASE BASED ON THE WATER ACTUALLY AT ISSUE, NOT BASED ON DEFENDANTS' ARBITRARY DEFINITIONS OF "THE AQUIFER."

Defendants claim the water at issue is interstate in nature because the formations (aquifers) in which the water is located do not exist solely in Mississippi but extend into other states, and that Defendants are able to pump the water from Mississippi into Tennessee using the formations as a conduit. In other words, Defendants contend that water located solely in Mississippi for thousands of years is not intrastate in nature, but is interstate in nature because they can use large commercial turbine pumps to forcibly pull the water across State lines, *i.e.*, the water becomes interstate through Defendants' artificial interference with natural conditions.

Identifying the "aquifer at issue" is an exercise fraught with confusion, complexity, and arbitrariness. "The term aquifer probably has more shades of meaning than any other term in hydrology. It can mean different things to different people and different things to the same person at different times." J-29, page 65 of 624. *See* Tr. 56 ("naturally occurring materials tend to be less than perfect" and

"tend to be a little messy."); Tr. 71 ("tremendous complexity" of Mississippi Embayment).

Some of the confusion in this case arise out of the general definition of the term "aquifer." The parties stipulated that "aquifer" means "a formation, a group of formations or part of a formation that contains sufficient saturated, permeable material to yield usable quantities of water to wells and springs." S17. Therefore, "aquifer" can be used to refer to a single formation/aquifer; *or* used to refer to a *group* of formations/aquifers. Defendants use the term "aquifer" to refer to a group of formations, while Mississippi believes the Court cannot ignore "single formation" aquifers present in the subject areas.

For example, the Sparta Sand is recognized in scientific literature as an aquifer; and the Memphis Sand is recognized as a separate aquifer. *See*, *e.g.*, J-71, page 1 of 1 ("Herein, the sand layers within the Sparta Sand and the Memphis Sand that comprise *the Sparta aquifer* and *the Memphis aquifer* will be referred to as the Sparta-Memphis aquifer." (emphasis added)); D-174 (article by Waldron) page 4 of 21, Figure 1 ("Transition [zone] is approximate southern extent of Memphis aquifer in northern Mississippi, where the regional middle Claiborne is divided into three or more distinct aquifers separated by regional confining units (Waldron, et al., 2010)."); J-41, pages 11-12 and 24-28 of 43 (article analyzing the tertiary aquifers in the Mississippi Embayment, including identification and discussion of the aquifer

characteristics of the Sparta Sand, and separate identification and discussion of the aquifer characteristics of the Memphis Aquifer); J-67, page 1 of 1 (distinguishing between location of the Sparta Sand and the Memphis aquifer; zone of transition from clay to sand "marks the southern limit of Memphis aquifer."); J-69, page 60 of 153 (chart separately showing the Memphis aquifer and the Sparta aquifer); Tr. 244.

It is also undisputed that the Sparta Sand and the Memphis Sand are found in different locations, and have materially different hydrogeologic characteristics, including thickness, sedimentary grain size, and transmissivity. Tr. 144. The Memphis Sand, an extremely thick formation of sand (predominantly), extends throughout western Tennessee, from the Kentucky border to the north and the Mississippi border to the south. The thick Memphis Sand formation disappears at or just south of the Mississippi border, and is replaced by the Sparta Sand and several other distinct formations identified by the USGS, each having different sedimentary compositions and hydrogeologic characteristics. J-18, pages 11-16 of 70; J-41; J-15. A recent depiction of the location of this transition zone (or "facies change") is contained in J-36, pages 25-28 of 41.

Additional confusion arises from the concept of "regional hydrogeologic units," which are broad classifications for groups of aquifers and for groups of confining layers. Tr. 95-96. A hydrogeologic unit can either be a "hydrogeologic aquifer unit," or a "hydrogeologic confining unit," *see* J-18, pages 11 and 15 of 70;

and a hydrogeologic aquifer unit may have multiple, separate aquifers within the unit. Tr. 95.

In the Mississippi Embayment, the USGS has identified a hydrogeologic aquifer unit that the USGS has labeled the "Middle Claiborne aquifer." The unit is comprised of multiple aquifers: the Lisbon in Alabama; the Sparta Sand in Mississippi, Kentucky, southern Arkansas, and Louisiana; and the Memphis Sand in Tennessee, Missouri, and northeastern Arkansas. J-18, page 15 of 70. The name given to this hydrogeologic aquifer unit, does not mean that the Sparta Sand in north Mississippi and the Memphis Sand in Tennessee must be the same aquifer. Instead, they have simply been broadly classified by the USGS as being part of a *hydrogeologic aquifer unit* known as the "Middle Claiborne aquifer." Tr. 104. As a result, the phrase "Middle Claiborne aquifer" is confusing. To some people, the phrase may appear to refer to a single "aquifer;" and to others, the phrase may appear to refer to a hydrogeologic aquifer unit containing multiple aquifers.

Confusion and disagreements even exist among Defendants' experts. MLGW's expert David E. Langseth contends in his expert report that "the aquifer at issue" is the "Memphis/Sparta Sand Aquifer (MSSA)," which Mr. Langseth defines as "[t]he aquifers of the Middle Claiborne, Lower Claiborne, and Upper Wilcox units, represented by layers 5-10 in the US Geological Survey (USGS) Mississippi Embayment Regional Aquifer Study (MERAS) model . . . ." D-191, page 10 of 80.

Tennessee's expert Brian Waldron disagrees with Mr. Langseth. According to Dr. Waldron, the aquifer at issue is the "Middle Claiborne aquifer," which he defines to include only the Memphis aquifer and the Sparta aquifer. D-194, page 5 of 37 ("The Middle Claiborne aquifer will be the geologic name applied in this report to represent the Memphis aquifer and the Sparta aquifer.").

More confusion arises when one compares the Defendants' respective positions to published scientific literature. Mr. Langseth's arbitrary blending of the aquifers of the Middle Claiborne, Lower Claiborne, and Upper Wilcox hydrogeologic units into a *single* aquifer is directly refuted by multiple USGS studies. *See, e.g.*, J-3, page 9 of 102 (separately identifying the middle Claiborne aquifer and the lower Claiborne-upper Wilcox aquifer as major aquifers within the Mississippi embayment aquifer system); J-4, page 21 of 68 ("From the facies change southward, where the units exist, the lower Claiborne confining unit *separates* the middle Claiborne aquifer from the lower Claiborne-upper Wilcox aquifer . . . ." (emphasis added)); J-5, page 24 of 115 (same); J-36, pages 29-31 of 41 (separate identification and discussion of the lower Claiborne aquifer); J-37, pages 8-9 of 14 (lower Claiborne aquifer recognized as distinct from middle Claiborne aquifer); J-42, page 26 of 50 ("The middle Claiborne aquifer splits into *two discrete aquifers* southward from the northernmost extent of the lower Claiborne confining unit."

(emphasis added)); J-43, page 11 of 62 (lower Claiborne-upper Wilcox aquifer shown as distinct from the middle Claiborne aquifer).

The "aquifer at issue" opinion offered by Dr. Waldron is even belied by his prior publications. *See* D-174 (article by Waldron), page 4 of 21, Figure 1 ("Transition [zone] is approximate southern extent of Memphis aquifer in northern Mississippi, where the regional middle Claiborne is divided into *three or more distinct aquifers* separated by regional confining units (Waldron, et al., 2010.") (emphasis added)); J-76 (EPA study co-authored by Waldron), pages 21-22 of 192 (discussion of "[t]he Sparta aquifer in northwestern Mississippi," including "the Sparta aquifer in Desoto County," and separate discussion of "the Memphis aquifer beneath Shelby County"); *see also* Tr. 913.

Even more remarkable is Dr. Waldron's conclusion in one of his prior, out-of-court reports that *the Memphis Sand is not even a single aquifer*: "In regard to the lower and middle Claiborne-Memphis aquifer, fine-grained intervals relative to the Basic City and Zilpha shales exist throughout the study area . . . suggesting that *the Memphis aquifer is better considered as three separate sub-aquifers*. This assertion is supported by tritium and other hydrologic tracer data that indicate *the upper, middle, and lower sand intervals within the Memphis aquifer have limited vertical hydraulic connectivity*. (Larson, et al., 2005; Gentry, et al., 2006."); J-76,

page 56 of 192 (emphases added). *See also* J-76, page 44 of 192 (chart showing an upper Memphis Sand, middle Memphis Sand, and lower Memphis Sand).

Tennessee's expert Steven Larson refers to the "Middle Claiborne" hydrogeologic unit as the aquifer. D-197, page 6 of 46. Mr. Larson notes, however, that the Middle Claiborne is one of three major aquifers in the Mississippi Embayment aquifer system; and asserts that those aquifers "are connected to one another hydrologically and cannot be considered or studied in isolation." D-197, page 7 of 46. Mr. Larson's "hydrologically-connected" theory implicitly suggests that entire Mississippi Embayment is "the aquifer at issue."

The Mississippi Embayment underlies (at least) eight states, with soils which are infinitely complex and diverse due to the natural forces which created the Mississippi Embayment millions of years ago. Tr. 67-75; S9. The subsurface geology includes discontinuous deposits of sedimentary materials, including sand, silt, and clay, and the generally-recognizable formations that vary in geographic coverage, thickness, permeability, specific yield, water quality, and other characteristics, (S8), and these characteristics in a single aquifer change dramatically over short distances. S8; Tr. 142, 146. *See also* J-13, page 5 of 26 ("quality of water from the freshwater aquifers in the Memphis area varies between different aquifers and within the same aquifer."). Mr. David Langseth confirmed these significant variations in local geology and hydrogeology. Tr. 1098-1100 (different materials

may be found by merely moving "over 100 feet;" subsurface formations vary greatly by depth as well, resulting in great variation of transmissivity and yield); Tr. 47-277; 369-387.

The confusion encountered in defining the "aquifer at issue" is unnecessary. This is a local dispute, involving only groundwater residing in northwest Mississippi, and the outcome of this case must focus on the water actually at issue. Regardless of the aquifers in which that water resides, the water at issue is, under the Constitution, subject to Mississippi's exclusive dominion and control.

IX. ARGUMENT

Defendants' position can be condensed to the assertion that Tennessee and its citizens are free to intentionally locate large-scale commercial groundwater pumping fields close to Mississippi and pump as much groundwater out of the natural groundwater storage of Mississippi as they can, because they can. Defendants' arguments attempting to conflate the common presence of underlying earth with all the groundwater naturally stored anywhere in a multistate area; and asserting that the mere existence of groundwater pumping in one state unavoidability appropriates a neighboring States' natural groundwater storage are diversions that attempt to confuse the issues. The issue presented is a conflict between two States over the violation of Mississippi's territorial sovereignty under the United States Constitution by intentional actions taken by Defendants in violation of that sovereignty.

To be clear, Mississippi's complaint is not that Defendants are taking too much of Mississippi's natural groundwater storage. It is that they are intentionally pumping that groundwater out of its natural storage within Mississippi sovereign territory and adversely changing the hydrogeologic conditions that exist in Mississippi, to the material damage and detriment of Mississippi's citizens. The record shows that Defendants' intentional taking of Mississippi groundwater and damage to hydrogeologic conditions in Mississippi were neither necessary nor unavoidable, and Defendants' intentional actions constitute a clear invasion of Mississippi's sovereign territory that would constitute an act of war between nations. *See* The Federalist No. 6 (Alexander Hamilton) (discussing wars between nations founded upon commercial motives.

The hollowness of Defendants' arguments to the contrary is apparent from the geological and hydrogeological facts presented at the hearing addressing the groundwater science applicable to the specific groundwater and groundwater systems at issue. The location and amount of groundwater removed from natural groundwater storage by pumping is limited by the size of the cone of depression created by the wellfield location, well spacing, volume and length of pumping, and the specific local geology of the groundwater formation being pumped. All of this said, even MLGW cannot pump any volume of local natural groundwater storage out of the entire Mississippi Embayment, the entire area covered by the Middle

Claiborne aquifer system, or even the entire disposition of the Memphis Sand in Tennessee, Missouri, and Arkansas.

Accordingly, this case only involves the taking of naturally stored groundwater and other impacts on the groundwater system in northwest Mississippi by the well documented massive commercial pumping in the Memphis area. For the same reasons, the existence of hydrological connections which make Defendants pumping of naturally occurring groundwater out of Mississippi possible has nothing to do with the classification of the Mississippi groundwater as an interstate or intrastate natural resource. Aside from the fact that Defendants are arguing that their groundwater pumping actually makes Mississippi's groundwater an interstate resource, they have constructed all of these arguments by completely ignoring the thousands of years that the Mississippi groundwater at issue naturally resides in storage within Mississippi absent pumping.

A. The Question Posed for the Hearing Must Be Decided As a Question of Sovereign Rights Between Coequal Sovereigns Under the United States Constitution.

The fact that Defendants have been pumping groundwater naturally stored within Mississippi's sovereign territory is not in dispute. The critically important question is whether Defendants have any right to take this groundwater under the United States Constitution. The answer is "no."

While this is a dispute between States under the United States Constitutional authority of the Court like *Kansas v. Colorado*, 206 U.S. 46 (1907) and other equitable apportionment cases involving water, the respective State's rights do not arise in federal common law of equity, but they arise directly under the Constitution and the 10th Amendment. The Court has long held that each State holds all sovereign authority of a nation within their respective boundaries, save the portion of that sovereignty they granted to the federal government. As succinctly stated in *Rhode Island v. Massachusetts*, 37 U.S. 657, 719 (1838), in this context the States are foreign to each other for all but federal purposes. Accordingly, this is a dispute between coequal sovereigns on a matter outside the realm of the federal government to be decided under the Constitution absent the type of Constitutional conundrum faced in *Kansas v. Colorado*. U.S. Const. amend. X; *PPL Montana, LLC*, 565 U.S. at 590-91; *Oregon ex rel. State Land Bd.*, 429 U.S. at 373 (1977); *Pollard*, 44 U.S. 212 (1845); *Martin v. Waddell's Lessee*, 41 U.S. 367 (1842); *Rhode Island*, 37 U.S. 657 (1838). No such conundrum is present in this case.

B. Mississippi's Sovereign Rights and Authority Arise From The Core Territorial Sovereignty Retained Under the Federal System Established Under the Constitution.

State territorial sovereignty is at the foundation of the federal system in the United States. As the Court explained in *Rhode Island v. Massachusetts*, as between two States neither State has any right beyond its territorial boundary, which

represents the true line of right and power between them. *Rhode Island,* 37 U.S. at 733, 735. This core attribute of retained State sovereignty in our federal system was affirmed in *Kansas v. Colorado* which addressed the specific problem created by an interstate river relied upon by all of the citizens in a large geographic territory that was cut up into territorially sovereign states with absolute authority over local control of water residing, even temporarily, within its borders. As the Court stated, no "State can legislate for *or impose its own policy* upon another." *Id.* at 95 (emphasis added).

This attribute of retained state sovereignty has not changed with regard to surface water, and certainly not with regard to groundwater. In *Tarrant Regional Water Dist.* the Court rejected the argument that Texas could reach into Oklahoma to access surface water being held under an interstate compact that gave Texas equal rights to the surface water of the Red River impounded in Oklahoma, subject to a 25% cap. *Id*. at 627. While the Compact clearly granted Texas an ownership interest in this body of water being held in Oklahoma, it was silent regarding any right to force Oklahoma to release the water under Oklahoma state law, which prohibited its release. In rejecting Texas' argument that it could force the release of this surface water, the Court affirmed Oklahoma's territorial sovereignty in a way directly applicable to this case:

> The background notion that a State does not easily cede its sovereignty has informed our interpretation of interstate compacts. We have long

> understood that as sovereign entities in our federal system, the States possess an "absolute right to all their navigable waters and the soils under them for their own common use." *Martin v. Waddell's Lessee,* 41 U.S. 367 (1842). Drawing on this principle, we have held that ownership of submerged lands, and the accompanying power to control navigation, fishing, and other public uses of water, "is an essential attribute of sovereignty," *United States v. Alaska*, 521 U.S. 1, 5, 117 S.Ct. 1888, 138 L.Ed.2d 231 (1997). Consequently, "'[a] court deciding a question of title to [a] bed of navigable water [within a State's boundaries] must ... begin with a strong presumption' against defeat of a State's title." Id., at 34, 117 S.Ct. 1888 (*quoting Montana v. United States*, 450 U.S. 544, 552, 101 S.Ct. 1245, 67 L.Ed.2d 493 (1981). *See also Solid Waste Agency of Northern Cook Cty. v. Army Corps of Engineers*, 531 U.S. 159, 174, 121 S.Ct. 675, 148 L.Ed.2d 576 (2001); *Utah Div. of State Lands v. United States,* 482 U.S. 193, 195, 107 S.Ct. 2318, 96 L.Ed.2d 162 (1987).

Id. at 663-662. Like the State of Texas in *Tarrant,* the State of Tennessee has absolutely no claim of right in law or equity to groundwater while it is residing in natural groundwater storage within the territorial boundaries of Mississippi, which in the absence of massive heavy pumping would remain in Mississippi.

C. Supreme Court Decisions Provide No Support For Equitable Apportionment of Groundwater Between States.

Defendants' pumping is easily distinguished from the surface water equitable apportionment river cases.[10] Before addressing a remedy in *Kansas v. Colorado*

[10]All of the Court's equitable apportionment cases begin by tracing the interstate path of the water. *E.g.*, *Kansas v. Colorado*, 206 U.S. 46, 50 (1907) (Arkansas River from Colorado through Kansas, Oklahoma, Indian Territory, Arkansas, and to the sea); *Wyoming v. Colorado*, 259 U.S. 419, 456 (1922) (Laramie River from Colorado through Wyoming to North Platte River); *New Jersey v. New York*, 283 U.S. 336 (1931) (Delaware River from New York to Pennsylvania, New Jersey, and Atlantic Ocean); *Nebraska v. Wyoming*, 325 U.S. 589, 592 (1945) (North Platte River from Colorado through Wyoming, Nebraska, and into Missouri River near Iowa); *Colorado v. New*

(equitable apportionment), the Court had to find an overriding equitable interest in the competing states, because within their borders "each State has full jurisdiction over the lands within its borders, including the beds of streams and other waters." *Id.* at 93. This equitable interest was found in the conditions pre-existing the creation of the two States: "Before either Kansas or Colorado was settled the Arkansas River was a stream running through the territory which composes these two States." This fact along with the scarcity of any water in the two states at the time was the basis for that equitable interest supporting the equitable remedy. *See Id.* at 98-99. In contrast, under the Constitution, the groundwater at issue that has been and continues to be taken by Defendants out of Mississippi groundwater storage is intrastate because (1) the groundwater is located, exists, and occurs in Mississippi, and (2) Mississippi has the exclusive authority under the Constitution to control, preserve, and protect it.

Mexico, 459 U.S. 176, 178 (1982) (Vermejo River from Colorado into New Mexico and the Canadian River); *Idaho v. Oregon,* 462 U.S. 1017 (1983) (tracing path of anadromous fish from Pacific Ocean up Columbia-Snake River through Wyoming, Idaho, Washington, Oregon, British Columbia); *South Carolina v. North Carolina,* 558 U.S. 256 (2010) (Catawba River flowing from North Carolina into South Carolina).

A few cases in which river water has been allocated between States involve questions of whether pumping from shallow aquifers in one State has denied the allocated river water to another, but these cases do not address groundwater independently, or water in a deep confined aquifer system like the one in the present dispute.

D. Practical Groundwater Policy Considerations

Mississippi respectfully suggests the Court be mindful of certain practical and policy considerations, including the resolution that would, consistent with the Constitution, best promote the management, preservation, and protection of groundwater, a most valuable resource. States have traditional and primary power over water within their borders, and courts have consistently recognized that those waters are held in trust by the State for the public. *See* Section IV(C), *supra*. Such authority imposes on the State a duty to control and conserve water for the benefit of all its inhabitants. *See City of Trenton v. New Jersey*, 262 U.S. 182, 184-85 (1923).

Because of vast differences within the local natural geology and resulting hydrogeology of groundwater resources, each State is in the best position to manage, preserve, and protect the groundwater resources within its borders. Mississippi respectfully submits that this Court should uphold and protect the public trust doctrine and each State's power to conserve and protect the groundwater located within its boundaries.

Upholding States' public trust authority would incentivize each State to better control groundwater production by their citizens and governmental subdivisions and encourage/mandate comity between neighboring States. The outcome advocated by Defendants does the opposite. It will incentivize, encourage, and embolden water purveyors/landowners in one State to place water wells right next to another State's

border and withdraw massive amounts of groundwater located in the neighboring State. The neighboring State would have no judicial recourse to protect its resources, at least until the affected aquifer is substantially harmed (which may be irreversible) and the aquifer is equitably apportioned by the Supreme Court (a practical impossibility, as discussed below). Under Defendants' proposed outcome, a State's prudent groundwater management and conservation practices could be easily nullified by a neighbor's intentional cross-border extractions.

This Court has often expressed a preference for States to resolve their disputes by "mutual accommodation and agreement." *Oklahoma v. New Mexico*, 501 U.S. 221, 241 (1991). But why should a State such as Tennessee enter an interstate compact when it is free to take all the Mississippi groundwater it desires absent equitable apportionment? An affected State such as Mississippi could, we suppose, get the offending State's (Tennessee's) attention by engaging in a "water war." On the other hand, *both* States will have an incentive to negotiate and enter an agreement relating to cross-border extractions if their respective rights to control, protect, and preserve the groundwater that is located within these boundaries are upheld.

The USGS has noted that the challenges of groundwater allocation, even by agreement, include: "trying to define the aquifer itself;" "unlike rivers, ground-water flow cannot be measured directly:" "the lag time between development stresses and resulting regional responses is very much longer in a ground-water system than in a

surface-water system;" "the allocation of existing ground-water flow rates may not provide a logical basis for distributing or allocating the development of the ground-water resource;" "there are serious measurement problems" in head distribution data; "hydraulic head also varies with depth and with time at any given location;" additional questions arise from the impacts of "withdrawals from other formations;" "possible effects of ground-water development on the stream flow and spring discharge" are difficult to "define precisely and accurately;" and "an interstate ground-water compact may require very precise, legally acceptable definitions that may imply a degree of measurement accuracy that cannot be technically or economically provided." J-51, pages 5, 6, 8-12 of 12.

Such issues are best left to States to resolve through negotiations, if necessary, not by this Court in an adversarial apportionment proceeding. More importantly, the Constitution cannot be ignored, and Mississippi's rights as a sovereign State must be protected.

X. CONCLUSION

The dispute at issue is a localized one, involving intentional violations of Mississippi's sovereignty. Equitable apportionment does not and cannot be applied to replace, circumvent, or diminish Mississippi's rights as a sovereign under the Constitution, and has no place in the resolution of the dispute presently before this Court. Defendants simply have *no right* to pull water from Mississippi into

Tennessee, *no right* to create a cone of depression underneath Mississippi, *no right* to change and adversely affect hydrogeologic conditions in Mississippi, and *no right* to insist that Mississippi forego or surrender its sovereignty. This Court should fashion a remedy that enforces and protects Mississippi's rights under the Constitution.

Dated: September 20, 2019.

Respectfully submitted,

THE STATE OF MISSISSIPPI

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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 the 20th day of September, 2019.

/s/ C. Michael Ellingburg
C. Michael Ellingburg

Counsel for Plaintiff