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

REPORT OF THE SPECIAL MASTER

EUGENE E. SILER, JR.
Special Master
UNITED STATES COURT OF APPEALS
FOR THE SIXTH CIRCUIT
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November 5, 2020

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I. INTRODUCTION

Mississippi believes the City of Memphis is stealing its groundwater. So it sued Tennessee, the City of Memphis, and Memphis Light, Gas & Water Division ("MLGW") for injunctive relief and money damages. *See* Mississippi's Motion for Leave to File Bill of Complaint, 2014 WL 5319728 (filed June 6, 2014); *Mississippi v. Tennessee*, 135 S. Ct. 2916 (2015) (granting motion for leave to file bill of complaint). Because Tennessee was a necessary party, and Mississippi is the plaintiff, only the Supreme Court has jurisdiction. Acting under that authority, the Court appointed the undersigned as the special master. *See* Order Appointing Judge Eugene Siler as Special Master, 136 S. Ct. 499 (2015). After review of the arguments and evidence, the Special Master recommends that the complaint be dismissed with leave to amend.

Mississippi's claims are simple: Tennessee has, by pumping in Shelby County, Tennessee, taken groundwater that would have remained in Mississippi for centuries. Over more than a decade of litigation, at every level in the federal court system, the core of Mississippi's claims has not wavered. Mississippi thinks Tennessee has stolen and continues to steal its water. Easy enough.

Underground, however, things get a little more complicated. The geology contains various rock formations and complex hydrology. And Mississippi claims those subsurface differences require distinguishing its water from the water that sits below other

states. Tennessee, on the other hand, thinks any of those geological differences are much ado about nothing.

The Special Master agrees with Tennessee. Accordingly, it is recommended that the Supreme Court find: (1) the groundwater contained in the Middle Claiborne Aquifer is the resource at issue; (2) that resource is interstate; and (3) equitable apportionment is the appropriate remedy for the alleged harm. Because Mississippi has explicitly not requested equitable apportionment in this action, it is also recommended that the complaint be dismissed with leave to amend, unless Mississippi declines the favor, in which case the complaint should be dismissed with prejudice.

II. Procedural Background

A. Previous Litigation

Mississippi first filed suit against Memphis and MLGW (collectively, the "Memphis Defendants") in the United States District Court for the Northern District of Mississippi. There, it alleged numerous claims related to MLGW's pumping. Amended Complaint at 9–15, *Hood ex rel. Mississippi v. City of Memphis, Tenn.*, No. 2:05-cv-00032-GHD (N.D. Miss. Oct. 5, 2006) (ECF No. 112); Complaint at 1, *Hood ex rel. Mississippi v. City of Memphis, Tenn.*, No. 2:05-cv-00032-GHD (N.D. Miss. Oct. 5, 2006) (ECF No. 2). The district court, however, dismissed the case for failure to join a necessary party under Rule 19 of the Federal Rules of Civil Procedure. *Hood ex rel. Mississippi v. City of Memphis,*

Tenn., 533 F. Supp. 2d 646, 650 (N.D. Miss. 2008). The court reasoned that the dispute was over interstate waters and thus equitable apportionment was the proper method for resolution. *Id.* at 648. But the Aquifer had never been apportioned. *Id.* So, any relief awarded would require "*de facto* apportionment of the subject aquifer." *Id.* And that, it held, was within "the original and exclusive jurisdiction of the United States Supreme Court because such a dispute is necessarily between the State of Mississippi and the State of Tennessee." *Id.*

On appeal, the Fifth Circuit affirmed. *Hood ex rel. Mississippi v. City of Memphis, Tenn.*, 570 F.3d 625, 627 (5th Cir. 2009). The panel agreed with the district court on both points of its decision: first, the aquifer was an interstate water source; and second, the resource "must be allocated before one state may sue an entity for invading its share." *Id.* at 629–30 (citing *Hinderlider v. La Plata River & Cherry Creek Ditch Co.*, 304 U.S. 92, 104–05 (1938)). And because Tennessee's interest in the Aquifer was implicated, Tennessee's "presence in the lawsuit was necessary to accord complete relief to Mississippi and Memphis." *Id.* at 631. Therefore, its joinder—which would result in a suit between states—would rob the district court of subject-matter jurisdiction. *Id.* at 632. That is, a suit between Mississippi and Tennessee triggers "the exclusive jurisdiction of the Supreme Court under 28 U.S.C. § 1251(a)." *Id.* As a result, dismissal was appropriate. *Id.* at 632–33.

Before, as now, Mississippi argued that "it owns a fixed portion of the Aquifer because it controls the resources within its state boundaries." *Id.* Not so, said the panel. "The Supreme Court has consistently rejected the argument . . . that state boundaries determine the amount of water to which each state is entitled from an interstate water source." *Id.* (citing *Hinderlider*, 304 U.S. at 102).

Mississippi then petitioned for certiorari. *Mississippi v. City of Memphis, Tenn.*, 130 S. Ct. 1319 (2010). It was denied. Simultaneously, Mississippi moved the Court for leave to file a bill of complaint. It too was denied (without prejudice).

B. Bill of Complaint and Appointment of the Special Master

Mississippi filed a motion for leave to file a bill of complaint in this case. That motion was opposed by Tennessee, the Memphis Defendants and the United States, acting as amicus curiae at the Court's invitation. Nonetheless, the Court granted leave to file the complaint. Tennessee and the Memphis Defendants subsequently filed answers.

Mississippi's complaint alleges that MLGW has "forcibly siphoned" off its water to the tune of billions of gallons. Compl. ¶ 23. And that without modern pumping technology none of that water would be available to Tennessee. *Id.* at ¶ 24. To make matters worse, Mississippi says Tennessee has removed groundwater far beyond "the water's natural seepage rate." *Id.*

Evidence of Tennessee's heist, Mississippi claims, can be seen in "substantial drop in pressure and corresponding drawdown of stored water in the Sparta Sand" and the "cone of depression" that extends into north Mississippi. *Id.* at ¶¶ 25, 30. Because Tennessee is allegedly stealing water at such a rapid rate, Mississippi must now drill wells to substantially greater depths. *Id.* at ¶ 54(b). Naturally, that practice has increased the costs on Mississippians who rely on the Aquifer for their groundwater.

But Mississippi also claims that liability flows from MLGW to both Memphis and Tennessee. *Id.* at ¶ 19. More specifically, it contends that those Defendants oversaw MLGW's pumping through its supervision, authorization, and regulation of the construction, operation and maintenance of the company's public water system. *Id.* at ¶ 21. Indeed, Mississippi alleges that Memphis and Tennessee controlled "the location and drilling of water wells and the withdrawal of groundwater from MLGW wells." *Id.*

Mississippi now seeks both declaratory relief and money damages for the taking of its groundwater. The declaratory judgment would establish Mississippi's "sovereign right, title and exclusive interest in the groundwater stored naturally in the Sparta Sand formation" which would not be available to the Defendants without pumping. *Id.* at ¶ 40. Mississippi also seeks "not less than $615 million" in monetary relief for the value of the groundwater already consumed by the Defendants. *Id.* at ¶ 55. In the alternative, Mississippi makes out claims for trespass, conversion, and

comparable tortious interference with its protected interests in tangible property. Accordingly, it requests "restitution for the value of all groundwater wrongfully taken from Mississippi." *Id.* at ¶ 56.

Mississippi does not, however, plead an alternative claim for equitable apportionment. To the contrary, Mississippi specifically rejects the application of equitable apportionment to this case. *See id.* at ¶¶ 38, 48–50. While Mississippi acknowledges that the Aquifer extends underneath both States, it alleges that the groundwater is stored only underneath Mississippi. *Id.* at ¶ 50. In fact, its position is Tennessee can only access the water underneath Mississippi by pumping it out. *Id.* As a result, Mississippi believes that the groundwater "is *neither* interstate water *nor* a naturally shared resource." Therefore, it claims that Tennessee has no right to the water; thus, equitable apportionment cannot apply.

After the complaint was filed, the Court appointed the undersigned as Special Master. An initial conference was held on January 26, 2016, and an agreed case management order was filed shortly thereafter. Under the agreed order, the Defendants could file motions for judgments on the pleadings. Dkt. No. 25 at 1.[1]

[1] Record citations to "Dkt." refer to entries on the Special Master's public docket, which can be found online. An index to the public docket is contained in Appendix D to this Report.

C. Summary of Proceedings Before the Special Master

Tennessee and Memphis filed motions for judgment on the pleadings. Dkt. Nos. 28, 30. The United States, acting as amicus curiae, filed a brief in support of those motions. Dkt. No. 32. Mississippi opposed the motions and moved to exclude some of the materials relied upon by the Defendants and the United States. Dkt. Nos. 42, 43.

After review, the Special Master denied the Defendants' motions.[2] Dkt. No. 55. While acknowledging that Mississippi's "complaint appears to fail to plausibly allege that the Sparta Sand aquifer ("Aquifer") or the water in it is not an interstate resource[,]" the Special Master decided to "err on the side of over inclusiveness." *Id.* at 1. Likewise, the Special Master declined to recommend dismissing the action based on issue preclusion in "the absence of a clear indication from the Court that issue preclusion attaches to determinations made by other courts on matters central to its exclusive jurisdiction."[3] *Id.* at 28. Thus, the Special Master decided to hold "an evidentiary hearing on the limited—and potentially dispositive—issue of whether

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[2] The parties' preliminary arguments were summarized in detail in the memorandum of decision. Dkt. No. 55 at 7-15.

[3] Since the Special Master previously declined to recommend that the Supreme Court dismiss this action based on issue preclusion, it is not considered as a basis for the recommendation in this Report.

the Aquifer is, indeed, an interstate resource." *Id.* at 1, 35–36. Limited discovery followed.

The Special Master then filed a pre-hearing scheduling order outlining the procedure for pre-hearing motions, dispositive motions, motions in limine, pre-hearing briefs, and exhibits and set a hearing schedule. The Defendants moved for summary judgment, Dkt. No. 70, Mississippi responded in opposition, Dkt. No. 71, and the Defendants replied, Dkt. No. 72. The parties also filed information about the credentials of their experts, Dkt. Nos. 73–75, motions to exclude, and motions in limine, Dkt. Nos. 76–82.

Before the hearing, the Special Master denied the Defendants' motions for summary judgment. Dkt. No. 93. Again, while noting that "Defendants present[ed] strong evidence that the Aquifer and water are interstate in nature," the Special Master concluded that an evidentiary hearing was necessary to ensure "a robust record" for the Supreme Court's review. *Id.* at 27.

Subsequently, the parties filed pre-hearing briefs, Dkt. Nos. 101–03, and a five-day evidentiary hearing was held, *see* Dkt. Nos. 105–09 (transcripts of evidentiary hearing). Then, the parties filed post-hearing briefing as set out in the pre-hearing scheduling order, Dkt. No. 69. Dkt. Nos. 113–19. A brief was filed by amici curiae law professors. Dkt. No. 124. The parties provided closing arguments in January 2020. Dkt. No. 131 (transcript of closing arguments), *see* Dkt. Nos. 132–34 (exhibits). The matter is now ripe for the Special Master's review.

III. EVIDENTIARY MOTIONS

The parties have filed evidentiary motions.[4] Those motions seek to exclude: (1) expert testimony and (2) certain other evidence. To determine how to rule, the Special Master may use the Federal Rules of Evidence as a guide. Supreme Court Rule 17(2). As always, however, the Special Master will err on the side of over-inclusiveness. With that in mind, the Special Master takes up the evidentiary motions.

David Langseth, Brian Waldron, and Steven Larson. Mississippi believes the testimony from these experts impermissibly reached the ultimate legal question of whether the aquifer at issue is an interstate resource. The status of the aquifer, however, presents a mixed question of law and fact. Therefore, their expert testimony—on issues such as flow rate, connection to surface waters, and barriers to flow—is relevant and helpful in determining the nature of the aquifer. To the extent the experts opine directly on the ultimate issue, the Special Master has ignored that testimony. Accordingly, Mississippi's motion is denied as moot. Dkt. 76.

Dr. Spruill's theory. Like Defendants' experts, Dr. Spruill's testimony and opinion about the characteristics of the aquifer is relevant to the question of whether the aquifer and groundwater are interstate resources.

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[4] Previously, Mississippi moved to exclude certain materials that Defendants relied on in support of their motions for judgment on the pleadings. Dkt. 43, Pl's Motion to Exclude at 3-4. The Special Master addressed Mississippi's motion to exclude in the Memorandum of Decision denying Defendants' motion for judgment on the pleadings. Dkt. 55 at 32-35.

But again, the Special Master does not rely on any testimony as to the ultimate question. As a result, Defendants' motion is denied as moot. Dkt. 79.

David Wiley. Defendants challenge the relevance and accuracy of Wiley's testimony about the volume of water MLGW has pumped out of the aquifer and the volume of water it has allegedly diverted across the state borders. The Special Master, however, has not relied on that testimony. Thus, it is denied as moot. Dkt. 77.

Two-aquifer theory. Defendants wish to block Mississippi from arguing there are two aquifers at issue. As grounds, the Defendants contend that Mississippi admitted during discovery that a single aquifer underlies both states. Nonetheless, Mississippi's "two-aquifer" theory is relevant to its argument that the aquifer at issue is a distinct intrastate resource. Moreover, the evidence relevant to that theory is useful for the Special Master's determination of whether the resource is interstate or intrastate. The motion in limine, therefore, is denied. Dkt. 78.

Designated deposition testimony, groundwater management practices, and certain exhibits. Because the Special Master has not relied on any of the evidence the Defendants seek to exclude, those motions are denied as moot. Dkt. 80–82.

IV. WHETHER THE AQUIFER AND GROUNDWATER AT ISSUE ARE INTERSTATE RESOURCES

For four reasons, the Special Master recommends that the Supreme Court find that the groundwater contained in the Middle Claiborne Aquifer is the resource at issue and that the resource is interstate. First, the Middle Claiborne Aquifer and the groundwater inside it is a single hydrogeological unit underneath several states. Second, Tennessee's water pumping affected the groundwater underneath Mississippi, showing that the Aquifer is an interconnected resource. Third, natural flow patterns indicate that the water inside the Aquifer would ultimately—even if slowly—flow across Mississippi's borders. Fourth, the water inside the Aquifer interacts with, and discharges into, interstate surface waters. Therefore, the Middle Claiborne Aquifer, which is part of a single interconnected hydrogeological unit underneath multiple states, is an interstate resource.

A. Background Facts on Hydrogeology

Groundwater collects beneath the Earth's surface in porous spaces of rock and sediment. Tr. 47:23-25 (Spruill); J-29 at 20. And those layers of the Earth's surface that are permeable enough to yield water—through wells or springs—are called aquifers or aquifer systems. S17; J-40 at 11; Tr. 569:1-5, 571:6-12

(Larson).[5] Aquifers are both the formation's geologic material and the water contained within it. Tr. 588:8-16 (Larson); *see also* Tr. 319:7-8 (Spruill); 988:3-8 (Langseth).

Aquifers, in turn, are made up of units with "similar hydrologic characteristics." D-191 at 9-10 (quoting Domenico & Schwarz, *Physical and Chemical Hydrogeology* 16 (2d ed. 1998)); *see also* Tr. 82:7-10 (Spruill), Tr. 571:14-21 (Larson). Those hydrogeological units are defined by the ease through which water flows within the unit, often called hydraulic conductivity or permeability. Tr. 165:16-22 (Spruill); 571:14-21 (Larson); D-194 at 9. Because hydrological units are composed of varying geologic materials, the level of permeability also varies. *See* Tr. 54:4-55:14, 165:24-166:2 (Spruill); J-2 at 17. Hydrogeologists call the gradual change in geologic material a "facies change" and the geologic material itself "facies." D-194 n.1; Tr. 607:8-13 (Larson).

Water never stops moving. Aquifers are no exception. D-197 at 12. They are always gaining (recharging) water and losing (discharging) water. S21; J-29 at 229; S28. Through this process, "groundwater [usually] flows from recharge areas . . . to discharge areas." Tr. 63:23-25 (Spruill); *see also* S30. In other words, the groundwater moves from areas of higher potentiometric level to places of lower potentiometric level. Tr.

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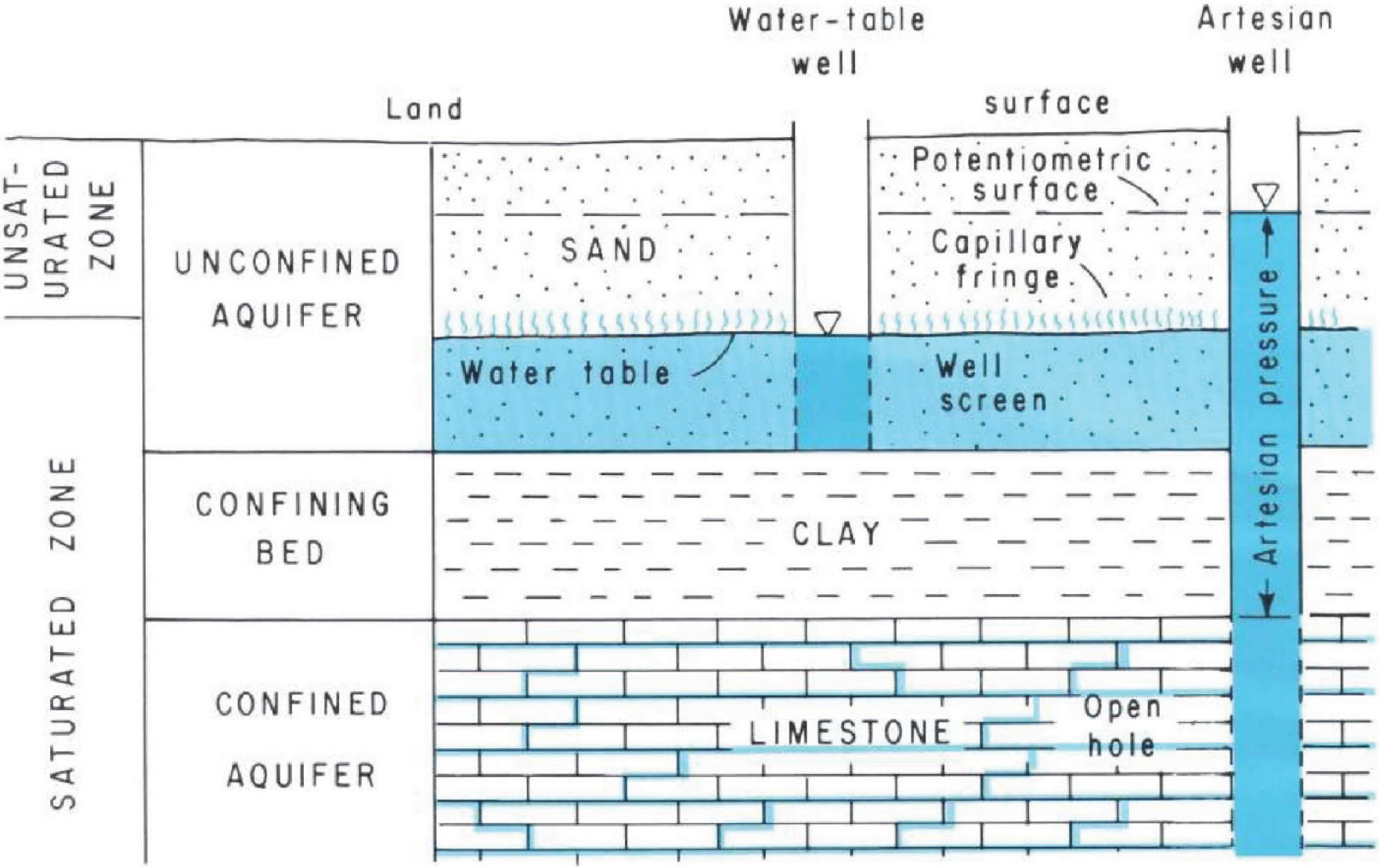
[5] Record citations to "S" refer to stipulated facts in Plaintiff's and Defendants' Joint Statement of Stipulated and Contested Facts. *See* Dkt. 64.

1014:18-1015:2 (Langseth); *see also* D-197 at 12; D-194 at 8. Even on a single stream an aquifer can both contribute and receive water. D-197 at 12. Those areas where the water bubbles to the surface—or comes close—are called outcrops. S25.

In most places the water stays stored deep underground. Nonetheless, people want it—it is clean and plentiful. So, to reach it, they dig wells. D-197 at 12. And then they pump. Although those actions draw up water, they do more than that. Pumping lowers the potentiometric pressure and causes a pattern of lower or depressed water levels around the wells. Tr. 584:21-585:7 (Larson); *see also* D-197 at 12; D-197 at 12-13; *see also* S18; Tr. 585:8-16 (Larson); J-29 at 336-38. In somewhat ominous terms, hydrogeologists call this the cone of depression. With this lesson in mind, we can turn to the four theories at hand.

Figure 1. Aquifers and Confining Beds

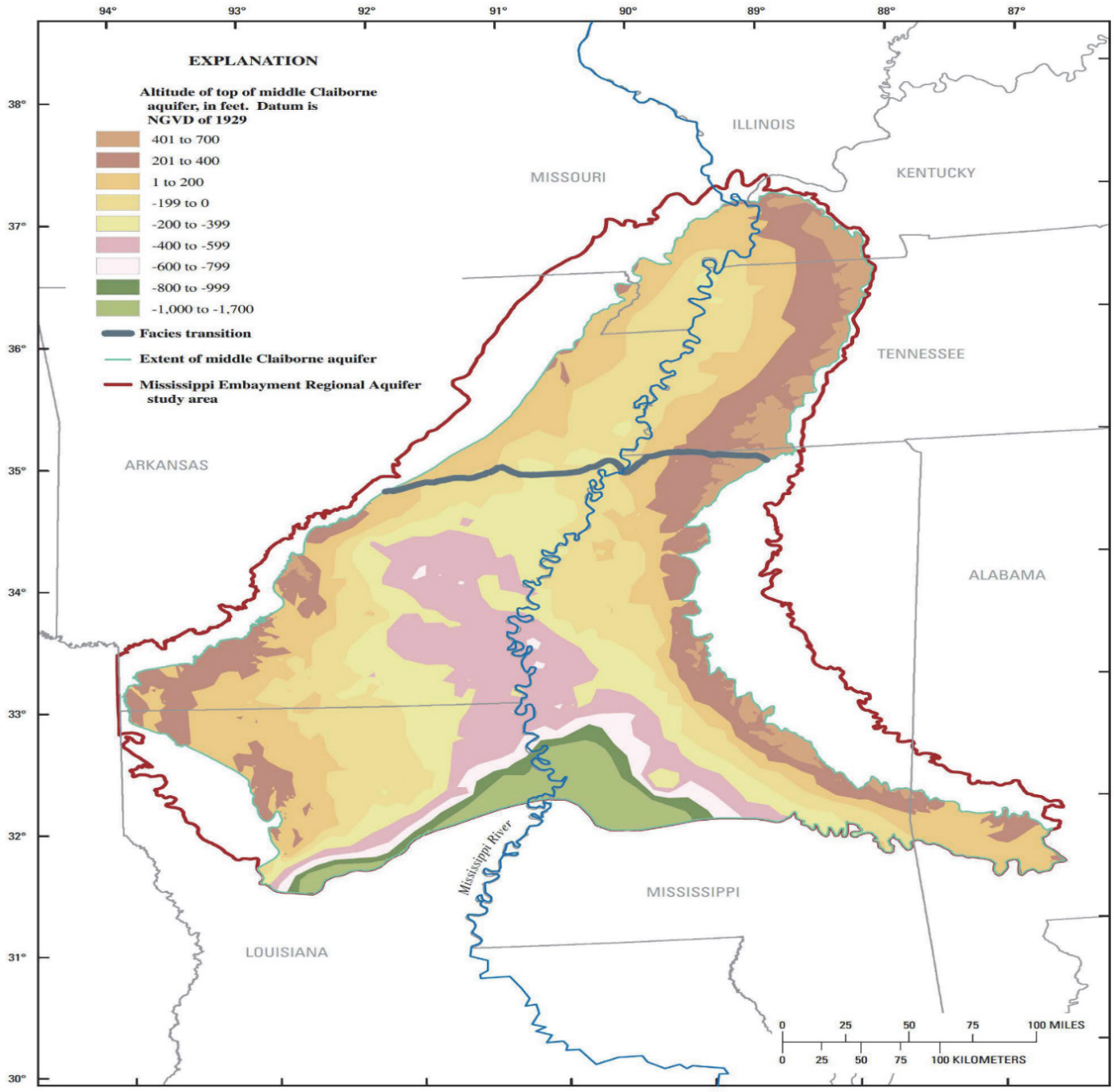


J-40 at 11.

B. Aquifer Theory

The Middle Claiborne Aquifer—as it is referred to by the United States Geological Survey ("USGS")—is a single hydrogeological unit that sits beneath the borders of several states. According to the Mississippi Embayment Regional Aquifer Study, the Aquifer "consists of the Sparta Sand in the southern part of the study area and the Memphis Sand in the northern part of the study area." J-36 at 22. And altogether the Aquifer extends through Tennessee and Kentucky in the north and through Louisiana, Mississippi, and Alabama in the south. *Id*.

Diagram 2 provides a visual representation the Middle Claiborne Aquifer. The Aquifer is overlaid on a map that contains state boundaries to demonstrate its interstate nature. The shading is based on the altitude of the top of the aquifer.



J-36 at 25 ("Figure 12" in original).

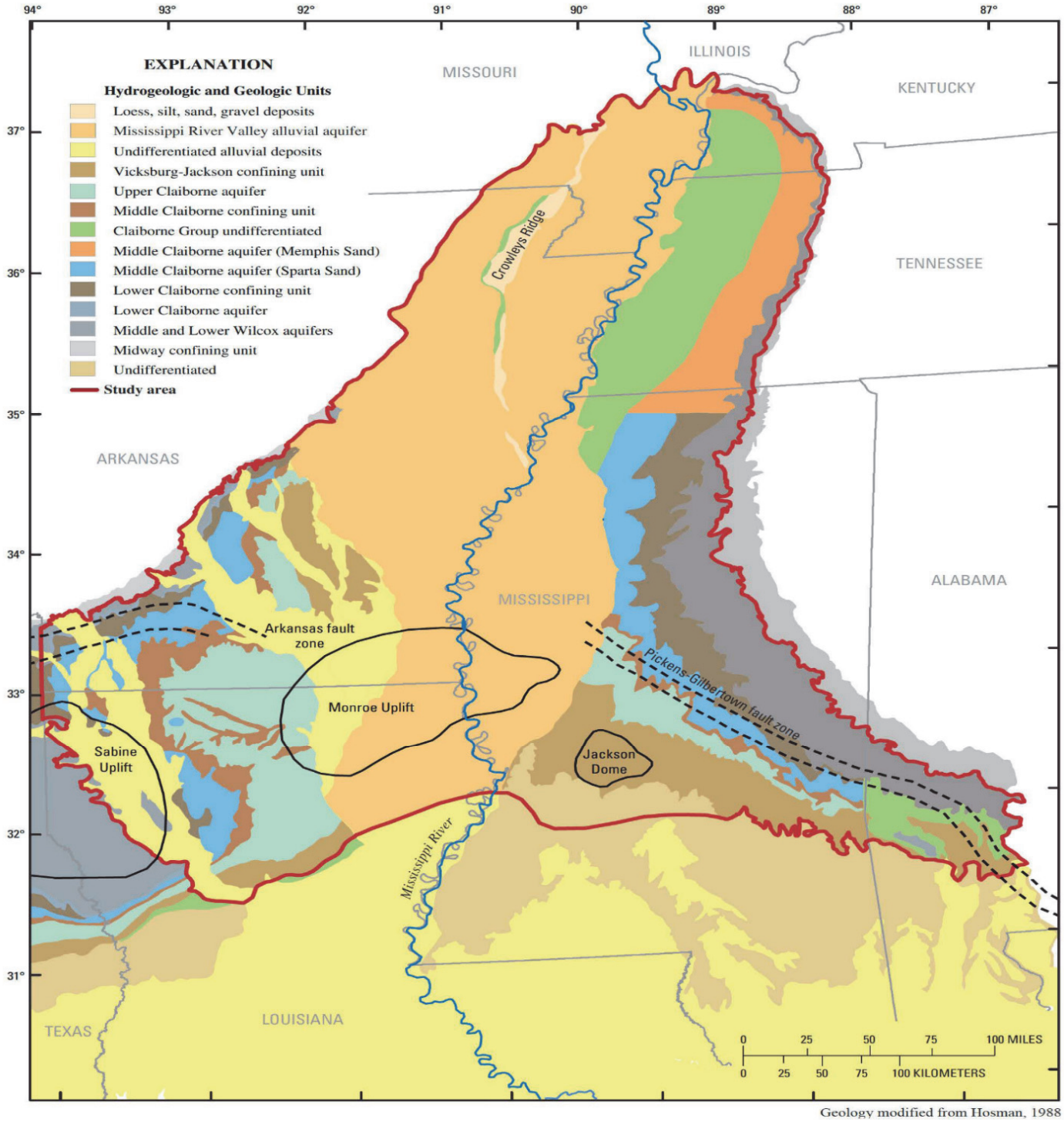
Experts agree that the Middle Claiborne Aquifer is underneath several states. Tr. 278:11-22 (Spruill); 596:25-597:8 (Larson); 807:1-25 (Waldron); 997:15-998:20 (Langseth); *see also* J-36 at 22. Experts also generally agree on its boundaries. Tr. 491:6-12 (Wiley); *compare* J-18 at 32 (Figure 14) *and* J-36 at 25 (Figure 12), *with* D-13 (Figure 2.2.1c) (depicting the lateral extent of the Memphis/Sparta Sand Aquifer ("MSSA")).

Wisely then, Mississippi does not directly challenge the expert consensus. Instead, Mississippi argues that it is a mistake to look at the Middle Claiborne Aquifer as a whole. And that if you zoom in, there are enough differences—such as thickness and permeability—to view its subsurface geology separately from the larger Aquifer. Those areas its expert calls the Memphis and Sparta Sands. Tr. 294:5-16 (Spruill). Inside, Mississippi says, sits the water at issue. As a result, it claims the water in dispute is solely within its territorial borders.

But Mississippi's argument is contrary to the weight of the evidence. As Mississippi acknowledges, "[t]he Sparta Sand in north Mississippi and the Memphis Sand in Tennessee [has] been classified by the USGS as being part of the larger regional hydrogeologic aquifer unit known as the 'Middle Claiborne aquifer.'" Pl's Proposed Findings of Fact and Conclusions of Law at 15 (emphasis omitted). So, Mississippi's view requires consideration of an aquifer's individual parts, not its sum total. Yet, by definition, an aquifer is nothing but a collection of interconnected units that contains enough permeable material to yield usable

quantities of waters to wells and springs. S17; J-40 at 11; Tr. 569:1-5, 571:6-12 (Larson). A subunit's presence in a single state, therefore, does not extinguish its interstate nature. Mississippi provides no reason to reject this basic understanding of aquifers.

Diagram 3. Surficial Geology of the Mississippi Embayment Regional Aquifer Study area



Geology modified from Hosman, 1988

J-36 at 15 (“Figure 3” in original).

Moreover, scientific consensus holds that the Middle Claiborne Aquifer is a single hydrogeological unit. To reach that conclusion, hydrogeologists have looked at borehole log data. Tr. 824:9-21 (Waldron); 1052:4-1053:6, 1057:2-22 (Langseth). Similarly, evidence demonstrates that water pumped from wells in Shelby County, Tennessee and DeSoto County, Mississippi come from the same source—the Middle Claiborne Aquifer. Tr. 492:17-24 (Wiley).

Mississippi's focus on variation in the composition of the Aquifer is misplaced. To be sure, the Aquifer lacks uniformity in thickness of geologic materials surrounding the aquifer; percentage of sand; storage capacity; and porosity. See J-5 at 34; J-10 at 28; J-7 at 9-12; Tr. 825:1-7 (Waldron). It also has confined and unconfined portions. D-194 at 8; Tr. 816:7-817:4; *see also* J-11 at 10-12; J-35 at 14-15; J-42 at 11-12. But these differences do not create distinct aquifers. Nor do any of these variances—facies changes—align with political boundaries or create barriers to groundwater flow within the structure. Tr. 825:8-826:8 (Waldron); 599:5-23 (Larson). That is, both the hydraulic conductivity and potentiometric levels extend across the state borders uninterrupted. J-18 at 26, 29; J-71; J-4 at 64; Tr. 598:13-19; 602:3-603:4 (Larson) (explaining exhibit J-71); *see also* J-22 at 66 (providing a map showing configuration of the piezometric surface of the "500-Foot" Sand in August 1960).

Besides, even if Mississippi had the correct level of specificity, the resource would still be interstate in nature. As Diagram 3 demonstrates, many of the

hydrological subunits cross the Mississippi-Tennessee border. No matter how (thinly) you slice it, the resource remains interstate. Mississippi's attempts otherwise come up unsuccessful.

C. Pumping Effects Theory

Tennessee pumps water from wells in Tennessee. And Mississippi experiences changes in the groundwater flow in the Aquifer beneath it. Yet, Mississippi has never alleged the Memphis Defendants used slant drilling to capture the groundwater in dispute. S35; Tr. 300:7-16 (Spruill); 492:3-12 (Wiley); 603:10-13 (Larson). Nor for that matter does it claim the Memphis Defendants ever physically enter Mississippi. So, effects seen in Mississippi show that there is an interconnected hydrogeological unit that crosses the Mississippi-Tennessee border. That alone undermines Mississippi's primary theory that the resource is intrastate in nature.

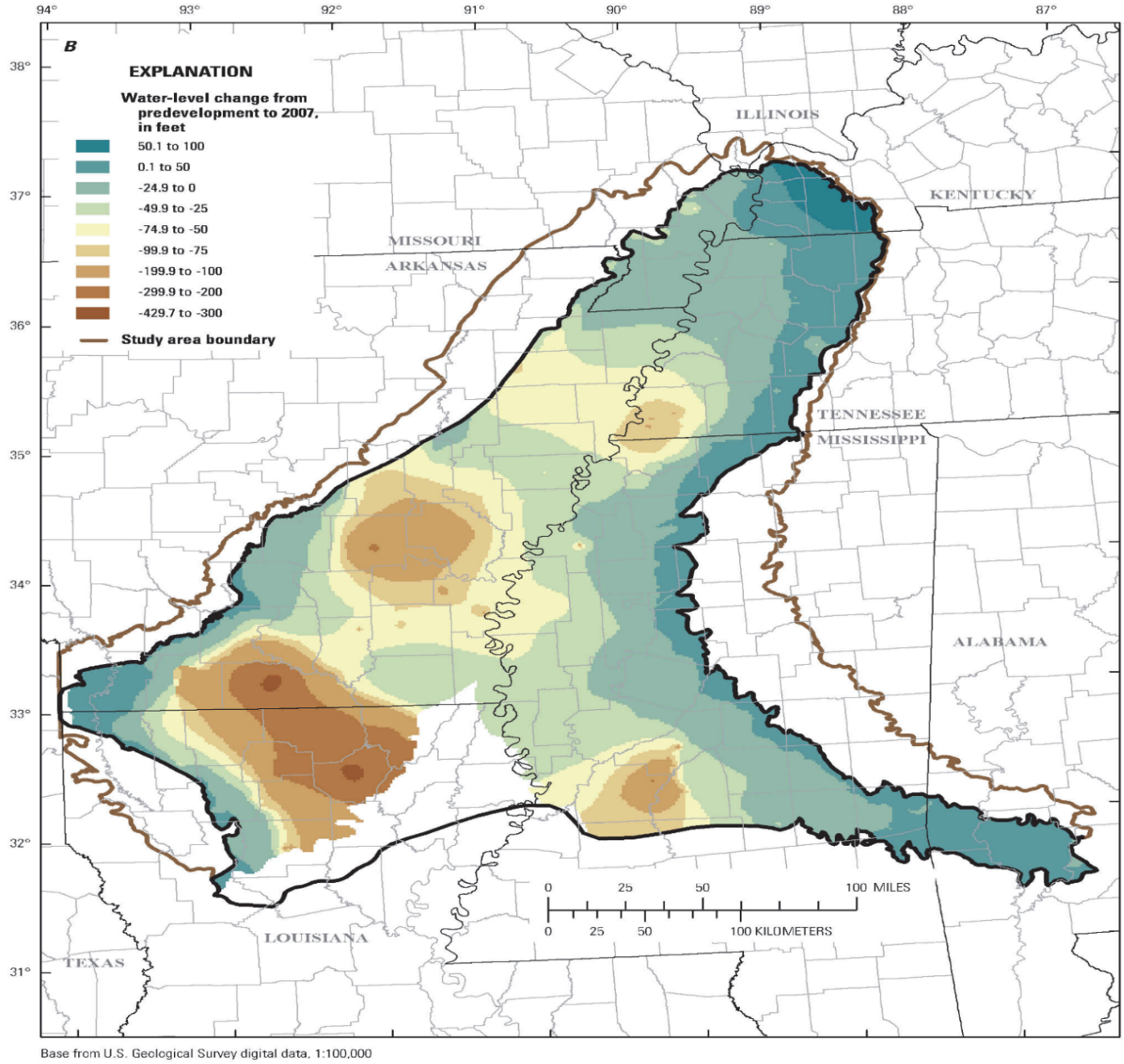
But how does this process work? As a rule, groundwater within an aquifer constantly moves from areas of high potentiometric levels to places of lower potentiometric levels. Tr. 1014:18-1015:2 (Langseth); *see also* D-197 at 12; D-194 at 8. And pumping groundwater lowers the potentiometric level around the well. Tr. 584:6-12; 584:21-585:7 (Larson); *see also* D-197 at 12. This results in a drawdown effect. Consequently, a cone of depression or depressed water levels are found extending out from the well. D-197 at 12-13; *see also* S18; Tr. 585:8-16 (Larson); J-29 at 336-38. Cone of

depressions then demonstrate the interconnectedness within a hydrogeological unit.

In sum, when Memphis pumps groundwater, effects from that action should be seen across the region. And they are. In fact, a regional cone of depression forms across the states of Arkansas, Mississippi and Tennessee. J-19 at 34, 49; Tr. 525:15-25 (Wiley); 604:18-24 (Larson). This cone of depression indicates that groundwater pumping from the Middle Claiborne Aquifer in the Memphis region creates a drawdown effect across state borders. D-198 at 11; Tr. 300:2-6 (Spruill); 493:2-13 (Wiley); 826:9-15 (Waldron). In other words, there is a single hydrogeologic unit that spans across state boundaries.

If, as Mississippi asserts, there is a distinct hydrogeological unit underneath the state, Memphis Defendants should be unable to capture any of Mississippi's water without physically entering the state. But Mississippi acknowledges that is plainly not the case. To the contrary, it claims Tennessee is taking its water through wells in the Memphis area. Therefore, there cannot be a hydrogeological unit within the exclusive control of Mississippi.

Diagram 4. Water Level Change from Predevelopment to 2007 in the Middle Claiborne Aquifer



J-19 at 34 ("Figure 14" in original).

D. Flow Theory

Under natural conditions, groundwater flowed between Mississippi and Tennessee.[6] J-67 (Reed map, 1972); J-24 at 23; P-168 (demonstrating "limited natural flow from Mississippi to Tennessee"); D-174 at 17; D-194 at 16; *see also* Tr. 304:7-305:20; 360:21-361:1 (Spruill); 506:8-509:21 (Wiley); 857:4-858:6 (Waldron) (testifying that he was unaware of any study of the Middle Claiborne Aquifer showing zero pre-development groundwater flow from Mississippi into Tennessee); 1020:10-1029:3 (Langseth). While the exact amount of flow is uncertain, it ranged anywhere from an inch per day to something more substantial than 37 million gallons a day. Tr. 532:20-533:23 (Wiley); Tr. 857:4-15 (Waldron); D-174 at 18-19 (Waldron & Larsen study) (estimating the quantity of groundwater exchanged between Shelby County, Tennessee and DeSoto County, Mississippi as approximately 186,000 m^3/d in 1886); D-194 at 28; Tr. 121:1-122:12 (Spruill); *see also* Tr. 405:10-16 (Wiley) (explaining that groundwater moves at a rate of inches per day). Mississippi does not dispute the expert consensus that at least some quantity of groundwater naturally crossed the border under natural conditions. Rather, it contends that most of the groundwater would remain under the state for generations without intervention and

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[6] "Natural conditions" or "predevelopment" refer to the state of the Aquifer prior to human intervention through groundwater pumping. In the Middle Claiborne Aquifer or Memphis Sand, predevelopment conditions generally refers to the period before 1886. J-4 at 26; J-5 at 11.

therefore the resource is intrastate in nature. *See* Pl's Closing Br. at 7–8. True, aquifer flow rates are different from surface waters. But any interstate movement demonstrates an interconnected hydrogeological unit. So, the presence of a natural flow supports a finding that the resource is interstate.

E. Surface Connection Theory

The Middle Claiborne Aquifer is also connected to interstate surface waters. More specifically, the groundwater in the Middle Claiborne Aquifer outcrop zone meets with surface water in the Wolf River. And the Wolf River—itself an interstate resource—flows from Mississippi into Tennessee and eventually discharges into the Mississippi River. J-7 at 29; J-10 at 19; J-18 at 13 (displaying map of streams in the model area); J-19 at 16; Tr. 502:15-503:20 (Wiley) (agreeing that the aquifer in this case is hydrologically connected to the Wolf River, which "ultimately discharges into the [Mississippi] [R]iver or the alluvial aquifer"). As a result, the Middle Claiborne Aquifer and the groundwater contained within it are interstate resources because the unit is hydrologically connected to interstate surface waters.

F. Conclusion

Substantial evidence demonstrates that the Middle Claiborne Aquifer is a continuous, interconnected hydrogeological unit beneath several states. Because it is an interconnected unit, groundwater flows within it

across the Mississippi-Tennessee border. What is more, the Aquifer is connected to interstate surface waters. Each of these features individually make the resource an interstate character. Therefore, the Special Master recommends that the Supreme Court find that the groundwater at issue is an interstate resource.

V. EQUITABLE APPORTIONMENT IS THE APPROPRIATE REMEDY

When states fight over interstate water resources, equitable apportionment is the remedy. Mississippi presents no compelling reason to chart a new path for groundwater resources. Nor do Mississippi's alternative theories override the prevailing federal common law. Accordingly, the Special Master recommends that Mississippi's complaint be dismissed with leave to amend the complaint to include a claim for equitable apportionment.

A. Equitable Apportionment and Interstate Waters in General

"Federal common law governs interstate bodies of water, ensuring that the water is equitably apportioned between the States. . . ." *Virginia v. Maryland*, 540 U.S. 56, 74 n.9 (2003) (citing *Colorado v. New Mexico*, 459 U.S. 176, 183 (1982)). States involved in a dispute over interstate bodies of water have two choices: (1) enter an interstate compact (which requires congressional approval); or (2) petition the Court for equitable apportionment. *See Kansas v.*

Nebraska, 135 S. Ct. 1042, 1052–53 (2015). Where a compact exists, the Court's role is to declare rights under it and enforce its terms. *Id.* at 1052 (citing *Texas v. New Mexico*, 462 U.S. 554, 567 (1983)). But, in the absence of a compact, "[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 stream." *Colorado v. New Mexico*, 459 U.S. at 183 (citing *Connecticut v. Massachusetts*, 282 U.S. 660, 670–671 (1931); *Kansas v. Colorado*, 206 U.S. 46, 98 (1907)). All agree, the Aquifer has neither been apportioned nor is subject to an interstate compact.

While Mississippi believes equitable apportionment does not apply, Compl. ¶¶ 38, 48, the defendants and the United States assert it does. Both positions are taken in turn.

B. Equitable Apportionment and Groundwater

Mississippi suggests a new rule for groundwater: Apportionment only applies when the groundwater is "hydrologically connected to . . . disputed surface water." Miss. Resp. 1 n.2; *see also* Compl. ¶ 41. There is, however, no basis for that limit. From rivers to runs of anadromous fish, equitable apportionment has been the rule. *See Idaho ex rel. Evans v. Oregon*, 462 U.S. 1017, 1024–25 (1983).

To be sure, groundwater in aquifers and surface water in streams, rivers and lakes are not identical. But that is not the inquiry. Instead, any differences

must be legally meaningful. And they are not. Indeed, equitable apportionment's strength is in its ability to tailor itself to each situation. So, for instance, it can account for factors like the slow flow rate of water in aquifers. Certainly, application to groundwater may be more difficult. Nevertheless, difficulty alone cannot dictate the use of a different doctrine. The Special Master must stay faithful to the Court's clear line of precedent. And the Court has been unequivocal, equitable apportionment applies even when "the action of one State reaches through the agency of natural laws into the territory of another State." *Id.* at 1024 & n.8 (quoting *Kansas v. Colorado*, 206 U.S. at 97–98). Pumping groundwater is no different. It affects another state through the operation of natural laws. Thus, equitable apportionment applies to aquifers.

C. Mississippi's Competing Territorial Theory

Mississippi believes it has the sole authority to govern "the appropriation of all water located within its territorial borders." Miss. Resp. 11. For support, Mississippi claims one need look no further than the Constitution. And it is true: both Article IV, Section 3, Clause 1 and the Tenth Amendment support the doctrine of equal footing. *See Puerto Rico v. Sanchez Valle*, 136 S. Ct. 1863, 1871 n.4 (2016) (citing *Coyle v. Smith*, 221 U.S. 559, 566 (1911)). That is, the Constitution leaves each state "that residuum of sovereignty not delegated to the United States" and places no state above another. *Id.* (quoting *Coyle v. Smith*, 221 U.S. at

567). Mississippi argues that if that is to mean anything, the groundwater is theirs. But Mississippi fails to show the doctrine's applicability to another state's pumping of an interstate resource.

Of course, Mississippi has full jurisdiction over the lands contained within its borders. *See Kansas v. Colorado*, 206 U.S. at 93. And, of course, that right extends to "control over waters within [Mississippi's] own territories." *Id.* Never, however, has the Court allowed one state's sovereignty to subsume an entire interstate resource. Nor does *Tarrant Regional Water District v. Hermann*, 133 S. Ct. 2120 (2013) suggest otherwise. There, a Texas state agency sought "to take 310,000 acre feet per year of surface water from the Kiamichi River, a tributary of the Red River located in Oklahoma." *Id.* at 2128 (footnote omitted). Yet, the agency knew that Oklahoma law "effectively prevent[ed] out-of-state applicants from taking or diverting water from within Oklahoma's borders." *Id.* at 2128–30. So, the Texas agency filed suit to enjoin enforcement of the Oklahoma restrictions as contrary to the Red River (interstate) Compact. The Court rejected Texas's claim. It first found, as a general matter, that Oklahoma had the sovereign "power to control . . . public uses of water" within its borders. *Id.* at 2132. It then held that the Red River Compact did "not create any cross-border rights in signatory States." *Id.* at 2136. Said simply, one state cannot *reach into* another state to collect water.

Mississippi, however, does not allege that any of MLGW's wells are located within its borders. *See*

Compl. ¶ 19. But again, *Tarrant* only protects a state against physical intrusion. Indeed, the Court has never suggested a state can sue for the effects of resource collection that happen outside its borders—that is, in the absence of equitable apportionment. To the contrary, the Court has rejected the notion that a state can "preserve solely for its own inhabitants natural resources located within its borders." *Idaho ex rel. Evans v. Oregon*, 462 U.S. at 1025 (citing *New England Power Co. v. New Hampshire*, 455 U.S. 331, 338 (1982); *Hughes v. Oklahoma*, 441 U.S. 322, 330 (1979); *Philadelphia v. New Jersey*, 437 U.S. 617, 627 (1978)). As a result, the Court has sometimes found that the state in which an interstate water source originates is "essentially irrelevant." *Colorado v. New Mexico*, 467 U.S. 310, 323 (1984).

Mississippi does not square this background with its rigid concept of sovereignty. Nor do the cases it cites support such a hard line. Consider each of those cases. First, *Rhode Island v. Massachusetts* simply concerned a dispute over the proper location of the boundary between two States. 37 U.S. 657, 726, 733–34 (1838). Second, *United States v. Louisiana* addressed a dispute between the federal government and several states over ownership of "the lands, minerals, and other natural resources underlying the waters of the Gulf of Mexico." 363 U.S. 1, 5 (1960). Third, *Louisiana ex rel. Guste v. United States* involved a suit over the depletion of hydrocarbon pool. 656 F. Supp. 1310, 1312 (W.D. La. 1986), *aff'd*, 832 F.2d 935 (5th Cir. 1987). The district court rejected the claim because it found the

United States had previously compensated Louisiana for any potential claim for depletion. *Id.* And, in many ways, the case resembled an equitable-apportionment dispute resolved under an interstate water compact. *See id.* at 1319 (noting that Louisiana complained that it was "deprived . . . of a reasonable opportunity to recover an *equitable share* of the potentially common pool" (emphasis added)). In sum, those cases are either inapplicable or support equitable apportionment.

D. Mississippi's Alternative Theories

Mississippi also asserts claims based on various state-law theories: trespass, conversion, "intentional tortious conduct," and restitution. But federal common law displaces those claims when the dispute involves an interstate body of water. *See Virginia v. Maryland*, 540 U.S. at 74 n.9. And Mississippi's reliance on state law to demonstrate the content of federal common law is unpersuasive. Miss. Resp. 23 & n.15. Equitable apportionment stands alone as the federal common-law principle for disputes over interstate water. *See Colorado v. New Mexico*, 459 U.S. at 183.

E. Interstate Water

Under current precedent, Mississippi's equal footing theory does not apply to the depletion of interstate bodies of water. Equitable apportionment then, is the most appropriate remedy for resolving disputes between states over interstate groundwater. Because the groundwater at issue here is best characterized as an

interstate resource, Mississippi's recourse for the alleged harm caused by MLGW's pumping is equitable apportionment.

VI. Conclusion

Water is finite. Especially the usable kind. And the Middle Claiborne Aquifer holds lots of it. Unsurprisingly, both Mississippi and Tennessee want it. Luckily, instead of war, the law requires they share it. *South Carolina v. North Carolina*, 558 U.S. 256, 289 (2010) (citing *Texas v. New Mexico*, 462 U.S. at 571 n.18). But Mississippi has not sought equitable apportionment. Therefore, the Special Master recommends that the Supreme Court dismiss Mississippi's complaint with leave to file an amended complaint based on an equitable-apportionment theory.

Dated: November 5, 2020

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