

No. 141, Original

In the

SUPREME COURT OF THE UNITED STATES

STATE OF TEXAS,

Plaintiff,

v.

STATE OF NEW MEXICO and
STATE OF COLORADO,

Defendants.

OFFICE OF THE SPECIAL MASTER

**NOTICE OF JOINT MOTION AND
JOINT MOTION OF THE STATE OF TEXAS,
STATE OF NEW MEXICO, AND STATE OF COLORADO
TO ENTER COMPACT DECREE SUPPORTING
THE RIO GRANDE COMPACT**

August 29, 2025

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TO THE HONORABLE D. BROOKS SMITH, SPECIAL MASTER,
AND TO THE UNITED STATES AND ITS COUNSEL OF RECORD:

PLEASE TAKE NOTICE that the States of Texas, New Mexico, and Colorado (hereinafter “Compacting States”) hereby jointly move the Special Master to approve and recommend to the Supreme Court the consent decree supporting the Rio Grande Compact (Compact Decree), which compromises and settles all claims among them arising from the Rio Grande Compact (Compact) in this proceeding.

If entered by the Court, the Compact Decree would resolve both Texas’s claims and New Mexico’s counterclaims in a way that is consistent with the Compact and the prior orders of the Court and Special Master. The Compact Decree clarifies measurement of Compact apportionments and is a lasting solution to a complex and longstanding dispute over the division of Rio Grande water. The Compact Decree achieves the ultimate goal of the Compact by ensuring that Texas and New Mexico both receive and can use their respective apportionments of the waters of the Rio Grande. It is fair, reasonable, and consistent with the Compact.

The United States does not oppose the Compact Decree, and this Joint Motion is unopposed.

Pursuant to the Special Master’s Orders of May 16, 2025 and July 25, 2025 (3d Cir. Docs. 46, 49), the Compacting States file the following materials concurrently herewith in support of this Joint Motion:

1. Memorandum of Points and Authorities in Support of the Joint Motion of the State of Texas, State of New Mexico, and State of Colorado to Enter Compact Decree Supporting the Rio Grande Compact;

2. Compendium of Exhibits in Support of the Joint Motion of the State of Texas, State of New Mexico, and State of Colorado to Enter Compact Decree Supporting the Rio Grande Compact, consisting of:
 - a. Exhibit 1: Consent Decree Supporting the Rio Grande Compact (with Appendices 1 and 2);
 - b. Exhibit 2: Declaration of Texas Rio Grande Compact Commissioner Robert Scott Skov in Support of the Joint Motion of the State of Texas, State of New Mexico, and State of Colorado to Enter Compact Decree Supporting the Rio Grande Compact (with Exhibit A);
 - c. Exhibit 3: Declaration of Texas Rio Grande Compact Commissioner Engineer Adviser Sue Ellyn “Suzy” Summers Valentine, P.E., C.F.M., in Support of the Joint Motion of the State of Texas, State of New Mexico, and State of Colorado to Enter Compact Decree Supporting the Rio Grande Compact;
 - d. Exhibit 4: Declaration of William R. Hutchison, Ph.D., P.E., P.G., in Support of the Joint Motion of the State of Texas, State of New Mexico, and State of Colorado to Enter Compact Decree Supporting the Rio Grande Compact (with Attachments A and B);
 - e. Exhibit 5: Declaration of Scott A. Miltenberger, Ph.D., in Support of the Joint Motion of the State of Texas, State of New Mexico, and State of Colorado to Enter Compact Decree Supporting the Rio Grande Compact (with Attachment A);

- f. Exhibit 6: Declaration of Elizabeth K. Anderson, P.E., in Support of Joint Motion of the State of Texas, State of New Mexico, and State of Colorado for Entry of Decree Supporting the Rio Grande Compact (with Exhibits A and B);
- g. Exhibit 7: Declaration of Craig W. Cotten, P.E., in Support of Joint Motion of the State of Texas, State of New Mexico, and State of Colorado for Entry of Compact Decree Supporting the Rio Grande Compact;
- h. Exhibit 8: Declaration of Margaret Barroll, Ph.D., in Support of Joint Motion of the State of Texas, State of New Mexico, and State of Colorado for Entry of Compact Decree Supporting the Rio Grande Compact (with Attachment);
- i. Exhibit 9: Declaration of Gregory K. Sullivan. P.E., in Support of Joint Motion of the State of Texas, State of New Mexico, and State of Colorado for Entry of Compact Decree Supporting the Rio Grande Compact (with Attachment);
- j. Exhibit 10: Declaration of Ryan J. Serrano in Support of Joint Motion of the State of Texas, State of New Mexico, and State of Colorado for Entry of Compact Decree Supporting the Rio Grande Compact; and
- k. Exhibit 11: Declaration of Hannah Riseley-White in Support of Joint Motion of the State of Texas, State of New Mexico, and State of Colorado for Entry of Compact Decree Supporting the Rio Grande Compact.

This Joint Motion is based upon this Notice, the materials filed concurrently herewith as identified above, including any and all exhibits and documentary evidence in support of this Joint Motion, any and all additional briefing by the Compacting States, to the extent ordered by the Special Master, all pleadings and records on file herein, all matters of which this Court must and may take judicial notice and upon such oral argument, testimony, and documentary evidence that may be presented at the hearing of this Joint Motion.

Respectfully submitted,

By: /s/ Stuart L. Somach

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EXHIBIT 1: Consent Decree Supporting the Rio Grande Compact

Appendix 1: Effective El Paso Index – Consent Decree
Supporting the Rio Grande Compact

Appendix 2: Map - Rio Grande Basin above Fort Quitman Gage

EXHIBIT 2: Declaration of Texas Rio Grande Compact Commissioner Robert Scott Skov in Support of the Joint Motion of the State of Texas, State of New Mexico, and State of Colorado to Enter Compact Decree Supporting the Rio Grande Compact (Skov Decl.)

Exhibit A: Resolution of the Rio Grande Compact Commission
Regarding the Proposed Compact Decree in Original
Action No. 141 *Texas v. New Mexico and Colorado*, in
the United States Supreme Court (August 22, 2025)

EXHIBIT 3: Declaration of Texas Rio Grande Compact Commissioner Engineer Adviser Sue Ellyn “Suzy” Summers Valentine, P.E., C.F.M., in Support of the Joint Motion of the State of Texas, State of New Mexico, and State of Colorado to Enter Compact Decree Supporting the Rio Grande Compact (Valentine Decl.)

EXHIBIT 4: Declaration of William R. Hutchison, Ph.D., P.E., P.G., in Support of the Joint Motion of the State of Texas, State of New Mexico, and State of Colorado to Enter Compact Decree Supporting the Rio Grande Compact (Hutchison Decl.)

Attachment A: William R. Hutchison, Ph.D., P.E., P.G., Resume

Attachment B: EEPI Excel Spreadsheet

EXHIBIT 5: Declaration of Scott A. Miltenberger, Ph.D., in Support of the Joint Motion of the State of Texas, State of New Mexico, and State of Colorado to Enter Compact Decree Supporting the Rio Grande Compact (Miltenberger Decl.)

Attachment: Scott A. Miltenberger, Ph.D., Resume

EXHIBIT 6: Declaration of Elizabeth K. Anderson, P.E., in Support of Joint Motion of the State of Texas, State of New Mexico, and State of Colorado for Entry of Decree Supporting the Rio Grande Compact (Anderson Decl.)

Exhibit A: Elizabeth K. Anderson, P.E., Resume

Exhibit B: Subfile Order and Final Judgment in SSI 104

EXHIBIT 7: Declaration of Craig W. Cotten, P.E., in Support of Joint Motion of the State of Texas, State of New Mexico, and State of Colorado for Entry of Compact Decree Supporting the Rio Grande Compact (Cotten Decl.)

EXHIBIT 8: Declaration of Margaret Barroll, Ph.D., in Support of Joint Motion of the State of Texas, State of New Mexico, and State of Colorado for Entry of Compact Decree Supporting the Rio Grande Compact (Barroll Decl.)

Attachment: Margaret Barroll, Ph.D., Resume

EXHIBIT 9: Declaration of Gregory K. Sullivan, P.E., in Support of Joint Motion of the State of Texas, State of New Mexico, and State of Colorado for Entry of Compact Decree Supporting the Rio Grande Compact (Sullivan Decl.)

Attachment: Gregory K. Sullivan, P.E., Resume

EXHIBIT 10: Declaration of Ryan J. Serrano in Support of Joint Motion of the State of Texas, State of New Mexico, and State of Colorado for Entry of Compact Decree Supporting the Rio Grande Compact (Serrano Decl.)

EXHIBIT 11: Declaration of Hannah Riseley-White in Support of Joint Motion of the State of Texas, State of New Mexico, and State of Colorado for Entry of Compact Decree Supporting the Rio Grande Compact (Riseley-White Decl.)

The State of Texas (Texas), State of New Mexico (New Mexico), and State of Colorado (Colorado) (collectively, “Compacting States”) jointly move the Special Master to approve and to recommend to the Supreme Court a consent decree supporting the Rio Grande Compact (Compact Decree) which compromises and settles all claims among the Compacting States arising from the Rio Grande Compact (Compact) in this proceeding.

Pursuant to the Special Master’s Orders of May 16, 2025 and July 25, 2025 (3d Cir. Doc. 46, 49),¹ the Compacting States file this memorandum, along with the Compact Decree, Appendices to the Compact Decree, and supporting declarations (Joint Motion). The Compacting States will further support this Joint Motion with testimony and evidence at the hearing² currently scheduled to commence on September 30, 2025.³

¹ Citations to “3d Cir. Doc.” refer to docket maintained by the Third Circuit Court of Appeals after Special Master D. Brooks Smith’s appointment.

² Pursuant to the Special Master’s July 25, 2025 Order (3d Cir. Doc. 49), the parties will provide the Special Master with a joint letter in advance of the hearing addressing the suggested sequence and time of presentations, along with the parties’ proposed procedure for the presentation of testimony and evidence.

³ The Compacting States agree that nothing in the declarations submitted in support of the Joint Motion, or the separately filed Joint Motion of the United States and New Mexico to Dismiss (US/NM Joint Motion), the agreements between and among the United States, New Mexico, and the Districts, the Decree of Dismissal, the Compact Decree, or any testimony elicited at the hearing commencing on September 30, 2025, shall be construed or allowed to vary or modify any of the terms of any of the agreements/decrees. In the event of any conflict between the

I. INTRODUCTION

After the Court sustained the United States' exception to the Third Interim Report and declined to enter the first proposed consent decree (hereinafter "First Decree"), the Compacting States re-initiated good faith settlement discussions with the United States. Ultimately, these discussions yielded a resolution that involves multiple settlement agreements⁴ and a revised consent decree, referred to as the Compact Decree. The Compact Decree is similar to, but not the same as, the First Decree that was the subject of the Third Interim Report and which was opposed by the United States. The United States does not oppose the Compact Decree, and this Joint Motion is unopposed.

The Compact Decree clarifies identified ambiguities in the Compact by establishing a measurement for water apportionments to Texas and New Mexico below Elephant Butte Reservoir and finally resolves the claims between the Compacting States in this protracted litigation. It adopts an index-based approach, consistent with the Compact's existing structure and similar to the apportionment methodologies employed in other interstate compacts and decrees. This approach

declarations or testimony at the hearing and the agreements/ decrees, the terms of the agreements/decrees shall control.

⁴ These settlement agreements are described below to provide background and context to the total resolution of this case. Importantly, however, other than the Compact Decree, these settlement agreements do not involve the states of Texas or Colorado.

clearly defines the rights and obligations of New Mexico and Texas below Elephant Butte Reservoir.

If entered by the Court, the Compact Decree would resolve both Texas's claims and New Mexico's counterclaims in a way that is consistent with the Compact and the prior orders of the Court and Special Master. The Compact Decree achieves the ultimate goal of the Compact—ensuring that Texas and New Mexico both receive and can use their respective apportionments of the waters of the Rio Grande. This settlement between the Compacting States is fair, reasonable, and consistent with the Compact, and it ends this lengthy and expensive litigation.

The Compact Decree clarifies measurement of Compact apportionments and is a lasting solution to a complex and longstanding dispute over the division of Rio Grande water. The Compacting States respectfully request the Special Master recommend entry of the Compact Decree to the Court.

II. STANDARD OF DECISION

The Supreme Court has long recognized the judicial power to enter consent decrees. *See Swift & Co. v. United States*, 276 U.S. 311, 324-26 (1928). Consent decrees “closely resemble contracts” (*Local No. 93 Int’l Assoc. of Firefighters, etc. v. City of Cleveland*, 478 U.S. 501, 519 (1986) (*Firefighters*)), but decrees have “attributes both of contracts and of judicial decrees.” *See United States v. ITT Cont’l Baking Co.*, 420 U.S. 223, 236 n.10 (1975).

The entry of a consent decree is a “judicial act.” *Pope v. United States*, 323 U.S. 1, 12 (1944). A consent decree “is entered as a judgment” that is “enforceable by citation for contempt,” and the Court “is more than a ‘recorder of contracts’ from whom parties can purchase injunctions[.]” *Firefighters*, 478 U.S. at 518, 525 (quoting 1B J. Moore, J. Lucas, & T. Currier, *Moore’s Federal Practice* ¶ 0.409[5], p. 331 (1984)). To receive judicial imprimatur, “a consent decree must spring from and serve to resolve a dispute within the court’s subject matter jurisdiction[.]” “must ‘[come] within the general scope of the case made by the pleadings,’ ” and “must further the objectives of the law upon which the complaint was based.” *Firefighters*, 478 U.S. at 525-26 (quoting *Pac. R. R. Co. v. Ketchum*, 101 U.S. 289, 297 (1880)). When those elements are satisfied, a consent decree may provide “more than what a court would have ordered absent the settlement.” *Rufo v. Inmates of Suffolk Cty. Jail*, 502 U.S. 367, 389 (1992).

The Court should refrain from “substantially changing the terms of a decree to which the parties consented without any adjudication of the issues.” *United States v. Atl. Ref. Co.*, 360 U.S. 19, 23 (1959). “Consent decrees are entered into by parties to a case after careful negotiation has produced agreement on their precise terms.” *United States v. Armour & Co.*, 402 U.S. 673, 681 (1971).

Accordingly, “the power to approve or reject a settlement negotiated by the parties before trial does not authorize the court to require the parties to accept a settlement

to which they have not agreed.” *Evans v. Jeff D.*, 475 U.S. 717, 726 (1986) (concerning Fed. R. Civ. P. 23(e)); *see also Cotton v. Hinton*, 559 F.2d 1326, 1331-32 (5th Cir. 1977) (“The settlement must stand or fall as a whole.”).

Settlement in this case entails additional considerations because (1) the subject matter of the suit involves “rights to an interstate waterway,” and (2) the Compact is “not just an agreement, but a federal law.” *Kansas v. Nebraska*, 574 U.S. 445, 454-55 (2015) (*Kansas*). Interstate water disputes are “ ‘basically equitable in nature.’ ” *Id.* at 453 (quoting *Ohio v. Kentucky*, 410 U.S. 641, 648 (1973)). The Court should consider whether the Compact Decree is a “ ‘fair and equitable solution[]’ ” that aligns with the “compacting States’ intended apportionment.” *Id.* at 472 (quoting *Texas v. New Mexico*, 482 U.S. 124, 134 (1987)). The Court may not “order relief inconsistent with [the Compact’s] express terms.” *Texas v. New Mexico*, 462 U.S. 554, 564 (1983); *see also Vermont v. New York*, 417 U.S. 270, 278 (1974) (“Once a consensus is reached there is no reason, *absent a conflict with an interstate compact*, why such a settlement would not be binding.”) (emphasis added). “[W]ithin those limits, the Court may exercise its full authority to remedy violations of and promote compliance with the [Compact], so as to give complete effect” to the apportionment. *Kansas*, 574 U.S. at 456.

There is an especially strong policy preference for settlement in interstate disputes. *See New York v. New Jersey*, 256 U.S. 296, 313 (1921) (reasoning that interstate disputes are “more likely to be wisely solved by cooperative study and by conference and mutual concession on the part of representatives of the States so vitally interested in it than by proceedings in any court however constituted”); *see also Colorado v. Kansas*, 320 U.S. 383, 392 (1943) (“We say of this case, as the court has said of interstate differences of like nature, that such mutual accommodation and agreement should, if possible, be the medium of settlement, instead of invocation of our adjudicatory power.”); *Nebraska v. Wyoming*, 325 U.S. 589, 616 (1945) (similar); *New Hampshire v. Maine*, 426 U.S. 363, 369-70 (1976) (entering consent decree as permissible under the Compact Clause because it “reasonably invest[ed] imprecise terms with definitions”).

III. BACKGROUND

A. The Rio Grande

The Rio Grande rises in southern Colorado and flows southward approximately 400 miles through New Mexico and into Texas near the City of El Paso. Below El Paso, the river defines the international boundary between the United States and Mexico. This original action involves the reach of the river from Elephant Butte Reservoir (Reservoir), located in New Mexico approximately 100 miles north of the Texas-New Mexico state line, to Fort Quitman, Texas.

B. The Rio Grande Project And Elephant Butte Reservoir

Conflicts over upstream depletions in the Upper Rio Grande Basin form the essential historical background to the Rio Grande Compact of 1938 and have been an enduring theme in the history of the basin. *See* Ex. 5, Miltenberger Decl. ¶ 16. Water users in Mexico near Juarez, in New Mexico’s Mesilla Valley, and in Texas’s El Paso Valley began complaining in the 1890s that diversions within Colorado’s San Luis Valley, near the Rio Grande headwaters, diminished river flows reaching their lands. *Id.* In response to Mexican protests, the federal government imposed an embargo on the use of federal land for reservoirs and other water facilities in 1896. *Id.* The embargo subsequently facilitated an international treaty with Mexico in 1906 (1906 Treaty) as well as development of the federal Rio Grande Reclamation Project (Project) in New Mexico and Texas that provided a physical solution to the problem of upstream depletion. *Id.* ¶ 17. Congress authorized the Project in 1905, extending the provisions of 1902 National Reclamation Act. *Id.*

Also in the early 1900s, the United States Reclamation Service (precursor to the Bureau of Reclamation, hereafter “Reclamation”) recommended that Congress authorize a storage reservoir near Elephant Butte, New Mexico. *See* Ex. 5, Miltenberger Decl. ¶ 17. Reclamation appropriated surface water for the Project under New Mexico territorial law, consistent with Section 8 of the Reclamation

Act. *Id.* ¶ 18. By 1919, construction of Elephant Butte Reservoir, including Elephant Butte Dam and the major diversion works of the Project, were complete. *Id.*

The Project was designed to deliver 60,000 acre-feet of water from Elephant Butte Dam to Mexico pursuant to the 1906 Treaty and to irrigate approximately 88,000 acres in New Mexico and 67,000 acres in Texas. *See* Ex. 5, Miltenberger Decl. ¶ 19. New Mexico and Texas authorized irrigators in the Project area to organize as irrigation districts—Elephant Butte Irrigation District (EBID) in New Mexico, and El Paso County Water Improvement District No. 1 (EPCWID) in Texas (collectively, “the Districts”)—to contract with Reclamation for water in exchange for taking on repayment obligations for Project construction costs. *Id.* ¶ 20.

C. The Rio Grande Compact

After years of negotiations and study (Ex. 5, Miltenberger Decl. ¶¶ 21-45), Texas, Colorado, and New Mexico executed the Compact in 1938 to apportion all the waters of the Rio Grande Basin above Fort Quitman, Texas, among the Compacting States.⁵ Compact, ch. 155, 53 Stat. 785 (1939); Ex. 5, Miltenberger Decl. ¶ 36. To accomplish that task, the Compact expressly defines two delivery

⁵ Compact Article XVI states it does not affect the United States’ obligations to Mexico and Indian Tribes.

obligations. First, Colorado must deliver water to the New Mexico state-line indexed to hydrologic conditions. Compact, art. III; Ex. 5, Miltenberger Decl.

¶ 36. Colorado’s equitable apportionment constitutes the water above the Colorado-New Mexico state-line minus Colorado’s Article III delivery requirement. Second, New Mexico must deliver water to Elephant Butte Reservoir in an amount also indexed to hydrologic conditions. Compact, art. IV; Ex. 5, Miltenberger Decl. ¶ 37. Part of New Mexico’s apportionment is the amount of water above the Reservoir less its Article IV delivery obligation.

However, the Compact does not end at the Reservoir; rather, it relies on the Project to deliver the apportionment as between southern New Mexico and Texas below the Reservoir. The water delivered to the Reservoir becomes “Usable Water” in “Project Storage,” which is available for release in accordance with “irrigation demands” and deliveries to Mexico. Compact, arts. I(l) and I(k). The Compact contemplates a normal annual release of “Usable Water” of 790,000 acre-feet per year to satisfy such demands. *Id.*, art. VIII; Ex. 5, Miltenberger Decl. ¶ 42. The Compact also requires a river gage below Caballo Reservoir to track Project releases. Compact, art. II. Pursuant to a 1938 Contract between the Districts and the United States, water supply in times of shortage must be divided according to the proportion of irrigable acreage situated in each State, 57% to New Mexico and 43% to Texas (hereinafter referenced as “57:43”). *See* Contract (Feb. 16, 1938),

Tr. Ex. JT-0426⁶; *see also* F. Clayton, Texas Compact Commissioner, to S. Smith, Tr. Ex. NM-2119.

No provision for a state-line delivery was made for Texas in the Compact, owing to the historical development of the Project. *See* Ex. 5, Miltenberger Decl. ¶ 43. Although the Districts contracted for the water appropriated for the Project, federal reclamation authorities operated the Project “as an administrative unit.” *Id.* Project infrastructure was built largely without regard to state boundaries, and diversions to serve lands in Texas were made within New Mexico. *Id.*

Although the Compact permitted Colorado and New Mexico to pursue other irrigation developments while protecting the Project, it did not explicitly limit water use to irrigation. *See* Ex. 5, Miltenberger Decl. ¶ 45. Any use of the apportioned waters was permissible, “subject only to the maintenance of depletions that had occurred, subject only to not increasing those overall depletions, there is a freedom in each State to store, develop, improve or do anything else within that State.” *Id.* Of note, groundwater was used on Project lands prior to the Compact. *Id.* ¶ 48. However, it was not considered as a source of augmentation for the basin’s water supply. *Id.*

⁶ Citations to “Tr. Ex.” refer to admitted trial exhibits from Phase I of the 2021 trial.

D. Post-Compact Project Operations

After the States entered the Compact, depletions continued to be a source of conflict within the Upper Rio Grande Basin despite the Compact. *See* Ex. 5, Miltenberger Decl. ¶ 46. Drought in the late 1940s and early 1950s led to an expansion of pumping to compensate for shortages of Project surface water deliveries, inclusive of drainage and return flows from irrigation. *Id.* ¶ 49. As the effects of the drought abated in the late 1950s, Project water users shifted away from groundwater pumping but did not abandon use of subsurface water entirely. *Id.*

Hydrological studies in the 1950s and 1960s documented an interconnection between Rio Grande stream flow and subsurface waters previously indicated in earlier 20th century investigations. *See* Ex. 5, Miltenberger Decl. ¶ 50. The new studies suggested that groundwater could supplement surface water during drought periods. *Id.* It also warned that if groundwater extraction expands, the hazards would include intercepting drainage and return flows necessary for downstream lands and degrading water quality overall. *Id.* Nonetheless, groundwater remains an important source of water for irrigation, domestic, municipal, and industrial uses in both States today.

Before 1980, Reclamation delivered Usable Water directly to individual farms in both States, roughly in accordance with the 57:43 ratio. Third Interim

Report of the Special Master (Third Report) 19, 8th Cir. Doc. 776.⁷ By the early 1980s, Districts satisfied their repayment obligations, and the United States switched to delivering water to the main canals for each District. *Id.* To accommodate this change, the United States developed a method for dividing the Usable Water in Project Storage between the Districts in each State using a regression analysis of data from 1951 to 1978 (D2 Period). Third Report 20. The resulting relationship between Project releases from storage and total Project diversions, termed the “D2 Curve,” has been used by the United States as a baseline to allocate water since the 1980s. U.S. Resp. to New Mexico’s Second Set of Requests for Admission, RFA 84, Tr. Ex. NM-1061; Third Report 19.

After another drought began in the early 2000s, the United States and Districts negotiated an operating agreement for the Project. Operating Agreement for the Rio Grande Project (2008 Operating Agreement), Tr. Ex. NM-2373. The 2008 Operating Agreement also uses the D2 Curve to calculate the allocations to the New Mexico and Texas irrigation districts. *Id.* New Mexico filed suit in federal district court challenging the 2008 Operating Agreement. *New Mexico v. United States*, No. 11-CV-00691 (D.N.M., filed Aug. 8, 2011); *see also* Third

⁷ Citations to “8th Cir. Doc.” refer to the docket numbers assigned on the docket maintained by Special Master Melloy, available at <https://www.ca8.uscourts.gov/texas-v-new-mexico-and-colorado-no-141-original> .

Report 22-23. That litigation was stayed upon the filing of this action. Third Report 100.

IV. PROCEDURAL HISTORY

A. Texas's Complaint

In 2013, Texas sought leave to file its Complaint against New Mexico, alleging that New Mexico violated its Compact obligations by permitting groundwater pumping and other diversions in New Mexico below the Reservoir and depleting Project water intended for use in Texas. Tex. Compl. ¶ 4, 8th Cir. Doc. 63. Texas filed its Motion for Leave to file Bill of Complaint on January 8, 2013. The Supreme Court granted Texas leave to file its Complaint on January 27, 2014. *Texas v. New Mexico*, 571 U.S. 1173 (Mem.) (2014).

The Texas Complaint alleges that the Compact was intended to equitably apportion the water of the Rio Grande above Fort Quitman, Texas, among the states of Colorado, New Mexico, and Texas. Tex. Compl. ¶¶ 3, 18, 8th Cir. Doc. 63. The Texas Complaint alleges the Project was the vehicle chosen by the Compact to ensure delivery of Texas's apportionment. Thus, the Compact must also protect Project operations related to Texas's apportionment. *Id.* ¶¶ 10-12. The Texas Complaint further alleges that New Mexico, contrary to the Compact, allowed and authorized Project water apportioned to Texas to be depleted through surface diversions and groundwater pumping in New Mexico. *Id.* ¶ 19.

Texas further alleges that, in practice, New Mexico granted rights, and otherwise authorized and permitted water users within New Mexico, to intercept return flows and tributary flows below the Reservoir for use in New Mexico, thereby depriving Texas of water that was apportioned to it. Tex. Compl. ¶ 19. Texas alleges that these actions violate New Mexico's obligations under the Compact, causing injury to Texas and its citizens. *Id.* ¶ 25.

Texas's Complaint seeks three forms of relief: (1) a declaration of Texas's rights "to the waters of the Rio Grande pursuant to and consistent with the Rio Grande Compact and the Rio Grande Project Act"; (2) a Decree commanding New Mexico to (a) deliver the waters of the Rio Grande to Texas in accordance with the provisions of the Compact and the Rio Grande Project Act, and (b) cease and desist actions which interfere with the operation of the Project to ensure delivery of Texas's apportionment; and (3) an award of damages to Texas for injury suffered as a result of New Mexico's past and continuing violations of the Rio Grande Compact and Rio Grande Project Act. Tex. Compl. 14-15.

B. The United States' Complaint In Intervention

On February 27, 2014, the United States moved to intervene as a plaintiff. In the United States Complaint in Intervention (U.S. Complaint), the United States, like Texas, alleges that groundwater diversions in the Lower Rio Grande intercept Project water, reduce Project efficiency, violate provisions of Reclamation law, and

violate the Compact. U.S. Compl., Doc. 65 ¶¶ 4-7, 12-14. The Court granted the United States leave to file its Complaint in Intervention on March 31, 2014.⁸

C. New Mexico's Motion To Dismiss

New Mexico moved to dismiss both Texas's and United States' Complaints on April 30, 2014. New Mexico's Motion to Dismiss Texas's Complaint and the United States' Complaint in Intervention filed April 30, 2014 (N.M. Mot. to Dismiss). After briefing on the Motion to Dismiss was complete, the Court, pursuant to its order of November 3, 2014, referred New Mexico's Motion to Dismiss to the Special Master. *Texas v. New Mexico*, 574 U.S. 972 (Mem.) (2014). The Special Master heard oral arguments on New Mexico's Motion to Dismiss on August 19, 2015. Transcript of August 19, 2015, Oral Argument Before Special Master on New Mexico's Motion to Dismiss Complaint of Texas and Intervention of the United States, 8th Cir. Doc. 37.

1. The First Interim Report

Special Master Grimsal issued his First Interim Report of the Special Master on February 9, 2017 (First Report, 8th Cir. Doc. 54). The Special Master recommended that the Supreme Court deny New Mexico's Motion to Dismiss the Texas Complaint because "Texas has stated plausible claims for New Mexico's

⁸ This Joint Motion does not request dismissal of the United States' claims. By separate motion of even date, the United States and New Mexico will move to dismiss the United States' Complaint in Intervention.

violation of the 1938 Compact.” First Report 217, 8th Cir. Doc. 54. In evaluating New Mexico’s Motion to Dismiss, the Special Master emphasized that the Compact is an agreement among “three quasi-sovereign States to apportion the Rio Grande—to which each has an equitable right—among themselves,” and that “the United States is not a signatory” to the Compact and did not receive an apportionment of water through the Compact. *Id.* at 229-30. Because no water is apportioned to the United States, the Special Master concluded that it cannot state claims against New Mexico under the Compact. *Id.* at 230-31. The Special Master therefore considered the United States’ claims as arising under Reclamation law and recommended that the Supreme Court exercise its discretionary jurisdiction under 28 U.S.C. § 1251(b)(2) to hear the United States’ Project claims against New Mexico for judicial economy. *Id.* at 231, 234.

2. Exceptions to the First Interim Report

The United States filed exceptions to the recommendations in the First Report related to New Mexico’s Motion to Dismiss the United States’ Complaint on June 9, 2017 (U.S. Exceptions). There, the United States argued that it may obtain declaratory and injunctive relief based upon New Mexico’s violations of the Compact, because the Compact is a federal law protecting federal interests. U.S. Exceptions 28. The United States argued that, to effectuate an equitable apportionment among the three Compacting States, the Compact incorporates and

relies upon the Project. *Id.* at 28. The United States also argued that it may obtain declaratory and injunctive relief against New Mexico to enjoin conduct that “violates the Compact to the detriment of the United States’ ability to comply with its treaty obligation.” *Id.* at 29.

3. The Supreme Court’s 2018 Opinion

The Court heard oral argument on the United States’ Exceptions and the Exceptions of Colorado related to the Motion to Dismiss the United States’ Complaint in Intervention on January 8, 2018, and issued its final ruling on March 5, 2018. There, the Court sustained the United States’ Exceptions, thus “allowing the United States to pursue the Compact claims it has pleaded in this original action.” *Texas v. New Mexico*, 583 U.S. 407, 415 (2018).

D. New Mexico’s Counterclaims

After the United States was admitted as an intervenor, New Mexico filed counterclaims against both Texas and the United States on May 22, 2018. N.M. Countercls., 8th Cir. Doc. 93. Essentially, New Mexico alleged that Reclamation’s operations after 2006 have deprived New Mexico of its full Compact apportionment.

New Mexico’s counterclaims against Texas generally allege that Texas is violating the Compact by (1) allowing unauthorized diversions and groundwater pumping that adversely impact the equitable apportionment of Rio Grande water

below the Reservoir and (2) receiving from Reclamation more than Texas' Compact apportionment. N.M. Countercls. ¶¶ 63-71, 91-98, 8th Cir. Doc. 93. New Mexico alleges that those violations have (1) caused New Mexico to receive less Project water than the Compact requires and (2) reduced the amount of Usable Water in Project Storage, adversely impacting Project efficiency, lowering the water table, and adversely impacting the aquifer. *Id.*

New Mexico also filed seven counterclaims against the United States. N.M. Countercls. ¶¶ 72-90, 99-132, 8th Cir. Doc. 93. Those counterclaims concerned, inter alia, violations of the Compact and other federal laws causing New Mexico to receive less than its Compact apportionment. *Id.* The United States moved to dismiss each of those counterclaims, and Special Master Melloy granted that relief in his March 31, 2020, Order 2, 28-38, 42, 8th Cir. Doc. 338.⁹

E. The Order On Cross Motions For Summary Judgment

In the fall of 2020, Texas, the United States, and New Mexico filed simultaneous motions for summary judgment. *See, e.g.*, Tex. Mot. for Partial Summ. J., 8th Cir. Doc. 413. N.M. Mot. for Partial Summ. J. on Compact

⁹ The Court has not yet approved the recommendation to dismiss New Mexico's counterclaims against the United States. The parties address this issue in parallel with the separate motion for decree dismissing the United States' claims against New Mexico.

Apportionment, 8th Cir. Doc. 415; U.S. Mot. for Partial Summ. J., 8th Cir. Doc. 414.

In Special Master Melloy’s May 21, 2021 Order on the motions for summary judgment (MSJ Order, 8th Cir. Doc. 503), the Special Master made several conclusions concerning interpretation of the Compact. Special Master Melloy concluded that the “Compact unambiguously establishes that: (1) New Mexico receives part of its apportionment above the Reservoir and part below; (2) New Mexico’s downstream apportionment is delivered by the Project; and (3) New Mexico owes Texas a duty to not interfere with the Project’s delivery of Texas’s Compact Apportionment.” MSJ Order 46, 8th Cir. Doc. 503. The Special Master further determined that “[t]he Compact and the inextricably intertwined Project and Downstream Contracts provide for [a] 57%/43% split” of Project supply. *Id.* at 51. But “[t]he Compact is ambiguous as to the detailed scope of the apportionments.” *Id.* at 47. To resolve this ambiguity, the Special Master determined that the Court must consider evidence to define a “baseline operating condition.” *Id.* at 49.¹⁰ Those conditions define the “Project water supply” that must be split 57:43. *Id.* at 46-53.

¹⁰ The amount of water that arrives at a given point on the river—e.g., the state-line—depends on many factors, including reservoir releases and the hydrologic conditions above the measurement point. *See, generally*, Third Report 18-19, 8th Cir. Doc. 503 (discussing effects of groundwater pumping). The “baseline” or “baseline condition” refers to the set of assumed hydrologic conditions that an

F. The First Phase Of Trial

At the conclusion of discovery, Special Master Melloy ordered a bifurcated trial as between liability and remedies. *See* Third Report 35; *see also* Trial Management Order ¶ IX, 8th Cir. Doc. 501; June 4, 2021 Order ¶ 3, 8th Cir. Doc. 508. The rationale for bifurcation was that it would be more efficient to present experts on damages after determining questions concerning liability (e.g., the amount of water of which a State was deprived).

In the fall of 2021, the parties commenced the liability trial. Third Report 34. During this first part of trial, and partly due to COVID restrictions, the Special Master further split the liability trial to allow for remote testimony from percipient fact witnesses and expert witness historians (Phase I), reserving the technical expert witnesses for an in-person second phase of the liability part of trial (Phase II).

Phase I of the liability trial began on October 4, 2021, with detailed opening statements from each party. *See* 10/4/2021 Trial Tr. Vol. I, 16:20-76:13 8th Cir. Doc. 701. Trial proceeded for 19 days through November 10, 2021, with testimony from each parties' fact witnesses and the States' expert historians. Final

index or other methodology uses to determine the expected delivery at a specified measurement point for any given amount of inflow (e.g., a reservoir release).

trial transcripts were prepared for all days of trial. *See generally* 8th Cir. Doc. 701. Phase II was scheduled to commence in the first quarter of 2022.

G. The First Decree

Before Phase II, the parties mediated before the Honorable Arthur Boylan. The Compacting States settled their claims based on the principles embodied in the First Decree, but they reached an impasse with the United States. Third Report 36. The Compacting States filed a motion seeking approval of the First Decree that would “codify a methodology for determining each State’s allocation of the Rio Grande’s waters.” *Texas v. New Mexico*, 602 U.S. 943, 947 (2024). The United States objected to the Compacting States’ motion. Special Master Melloy granted the motion and recommended entry of the First Decree in his Third Report. The United States filed an exception to the Third Report. U.S. Exception Br., 8th Cir. Doc. 787.

H. The Supreme Court’s 2024 Decision

On June 21, 2024, the Supreme Court issued its decision sustaining the United States’ exception. The Court held that because the First Decree would dispose of the United States’ claims without its consent, the Compacting States’ motion to enter the First Decree was denied. *Texas v. New Mexico*, at 965. The Court explained that “were the consent decree adopted, the United States would be precluded from” pursuing its Compact claims against New Mexico in other forums.

Id. at 963. Thus, the Court returned the case to the Special Master to continue the litigation and proceed with Phase II.

I. Renewed Settlement Efforts

The Special Master ordered the parties to resume Mediation under the guidance of Judge Boylan. Oct. 25, 2024 Special Master Order, 3d Cir. Doc. 21. After about a year of additional mediation, the parties reached a settlement. *See* Joint Mot. of Texas, New Mexico, Colorado, and the United States to Vacate the June 9, 2025, Trial Date and Set a Hr’g on Mots. Related to Settlement, 3d Cir. Doc. 45. The settlement involves this request for the Special Master’s recommendation that the Court enter the Compact Decree and dismiss the claims among the Compacting States. *Id.* ¶ 8. Separately, New Mexico and the United States seek the dismissal of the claims and counterclaims among them in a concurrently filed motion by the United States and New Mexico, supported by agreements described hereinbelow in section V.D.¹¹

V. SUMMARY OF COMPACT DECREE

The Compact Decree specifies procedures to ensure the proper apportionment of Rio Grande water between Texas and New Mexico below

¹¹ These agreements are introduced to the Special Master as attachments to the US/NM Joint Motion. The Compacting States do not oppose the US/NM Joint Motion. Texas and New Mexico do not object to, and Colorado takes no position on, the agreements attached to the US/NM Joint Motion.

Elephant Butte Reservoir and quantifies New Mexico’s obligation to deliver water to Texas. The Compact Decree does this primarily by establishing a measurement method, the Effective El Paso Index, to track water from the Reservoir to Texas. While it is similar to the First Decree, it is not the same. Importantly, it removes the obligations of the United States previously identified in the First Decree and leaves day-to-day operational details to separate negotiated agreements outside of the Compact Decree and to which, of the Compacting States, only New Mexico is a party.

A. The Effective El Paso Index

The centerpiece of the Compact Decree is the Effective El Paso Index (“Index” or “EEPI”) (Ex. 1, Decree at § II.B-F), which establishes an annual, volumetric measurement for the Compact’s apportionment to Texas. *See* Ex. 4, Hutchison Decl. ¶¶ 15, 17. The Index approach described in the Compact Decree is similar to the indices used to govern the division of water elsewhere in the Compact.

Under an index-based compact, flow through an upstream gage determines a downstream state’s compact apportionment and sets a water delivery obligation on the upstream state. Any deviation from this obligation provides for credits (or positive departures) and debits (or negative departures) on an annual and accrued (accumulated) basis. Index-based compacts define limits for negative accrued

index departures that cannot be exceeded. The Compact already has two index-based obligations upstream of Caballo Dam that function in this manner—Article III for delivery of water by Colorado to New Mexico, and Article IV for delivery by New Mexico to the Reservoir.

The Compact Decree defines an index under which the annual release from Caballo Dam will be used to measure Texas’s apportionment at the El Paso Gage (USGS 08364000), a stream gage very near the New Mexico-Texas state line. *See* Ex. 4, Hutchison Decl. ¶¶ 27, 28. The Index has two basic parts: the Index Obligation, which defines the New Mexico annual delivery target; and the Index Delivery, which is a measurement of the amount of water that New Mexico delivers to Texas. Ex. 1, Decree § II.B.2.e-f; Ex. 4, Hutchison Decl. ¶¶ 17, 18.

The formula used to calculate the Index Obligation is based on a 2-year regression analysis comparing historical releases at Caballo Dam with stream flows at the El Paso Gage during the D2 Period. *See* Ex. 4, Hutchison Decl. ¶¶ 77-80; Ex. 8, Barroll Decl. ¶¶ 22-26. The Index Obligation will be calculated annually based on current-year and previous-year releases from Caballo Dam using this formula. *See* Ex. 4, Hutchison Decl. ¶¶ 81-91. The Index Delivery will be calculated annually based on annual stream flow measured at the El Paso Gage, adjusted for deliveries to Mexico, Texas water use above the El Paso Gage, and other factors. *See* Ex. 8, Barroll Decl. ¶ 24; Ex. 4, Hutchison Decl. ¶¶ 22-27, 92.

B. Accounting And Compliance Procedures

New Mexico's compliance with the Compact will be measured by comparing the Index Obligation with the Index Delivery. *See* Ex. 4, Hutchison Decl. ¶¶ 92-93. The difference between the Index Obligation and the Index Delivery is the Annual Index Departure. *Id.* ¶ 92. Ideally, the Index Delivery will equal the Index Obligation, but the Compacting States acknowledge that this is unlikely due to several factors related to the conveyance of water between Caballo and the El Paso Gage, a distance of nearly 100 miles. *See id.* ¶¶ 92-94; Ex. 9, Sullivan Decl. ¶ 16. The Compact Decree therefore allows New Mexico to accrue (accumulate) departures so long as specified Negative Departure limits are not exceeded. Ex. 8, Barroll Decl. ¶¶ 29-32 (describing "triggers" to avoid exceedances); Ex. 4, Hutchison Decl. ¶¶ 95, 112. This provision is comparable to provisions in Article VI of the Compact, which allow New Mexico and Colorado to accrue debits on their delivery obligations upstream of the Reservoir, within specified limits.

The Negative Departure limits set in the Compact Decree are 150,000 acre-feet for the first five years and 120,000 acre-feet thereafter. Ex. 1, Decree at § II.C. If New Mexico reaches 150,000 (or 120,000 after year five) acre-feet of Accrued Negative Departures from the Index Obligation, it is in violation of the Compact Decree. *See* Ex. 9, Sullivan Decl. ¶¶ 18-19; Ex. 4, Hutchison Decl. ¶¶ 116-119.

To help prevent New Mexico from reaching the Negative Departure limit, the States also negotiated an intermediate negative “trigger” of 80,000 acre-feet. Ex. 1, Decree § II.D; Ex. 8, Barroll Decl. ¶¶ 33-36; Ex. 4, Hutchison Decl. ¶ 120. If New Mexico reaches the intermediate negative trigger, New Mexico must first impose additional water administration to reduce accrued Negative Departures to 16,000 acre-feet within six years. Ex. 1, Decree § II.D.2.a; Ex. 4, Hutchison Decl. ¶ 120. New Mexico has discretion concerning how it administers water to address an Accrued Negative Departure. *Id.*

The Compact Decree contemplates water transfers (Transfers) between the Districts as one means to address Index Departures and provides rules for Index Accounting after a Transfer.¹² Ex. 1, Decree § II.C.4.b; Ex. 4, Hutchison Decl. ¶ 122. If New Mexico exceeds the Accrued Negative Departure Limit for three consecutive years, then it must provide 12,000 acre-feet of water in excess of its Index Obligation for each year that it exceeds the Accrued Negative Departure

¹² The Compact Decree does not contain terms governing the procedure to initiate and implement a Transfer. Instead, the Transfer procedure is set out in separate agreements among New Mexico, the United States, and the Districts. The Operations Settlement Agreement sets out a procedure for New Mexico to order and the United States to implement Transfers to which EBID and EPCWID have consented. Ex. 10, Serrano Decl. ¶¶ (D)(1)-(7). EBID and the United States have agreed to a Miscellaneous Purposes Act contract permitting the transfer of water, and EBID and New Mexico have entered into a Third-Party Implementing Contract, with the United States’ approval, setting forth the terms under which New Mexico may compensate EBID for water subject to a Transfer. *Id.*

limit, and if New Mexico exceeds the Accrued Negative Departure Limit for four consecutive years, then it must provide 15,000 acre-feet of water in excess of its Index Obligation for each additional year. *Id.* § II.C.4.b; Ex. 4, Hutchison Decl. ¶¶ 118-119.

During low water years, when Caballo Releases are less than 200,000 acre-feet, the Index does not apply. *See* Ex. 4, Hutchison Decl. ¶ 88. In those years, the Annual Index Departure is deemed to be zero. Ex. 1, Decree § II.E.1.a. Likewise, when Caballo Releases are greater than 790,000, the Index Obligation is calculated as if the release were 790,000 acre-feet. *Id.* § II.E.1.b; *see* Ex. 4, Hutchison Decl. ¶ 88. The Compacting States have also provided for certain adjustments to Index Departures, including extinguishing all Accrued Index Departures (positive and negative) during years when an “actual or hypothetical spill,” as that phrase is used in the Compact, occurs. *Id.* § II.E.4; Ex. 4, Hutchison Decl. ¶ 109.

Based on the technical evaluations of the Index methodology reflected in the Hutchison, Sullivan, and Barroll Declarations, the Index methodology will resolve the Compact apportionment dispute. Ex. 4, Hutchison Decl. ¶¶ 124-130; Ex. 9, Sullivan Decl. ¶¶ 23-28; Ex. 8, Barroll Decl. ¶ 83. The States are committed to satisfying their various obligations under the Index methodology. *See, e.g.*, Ex. 6, Anderson Decl. ¶¶ 23-24.

C. Changes From The First Decree

The First Decree and the Compact Decree are fundamentally similar. EEPI, calculations related to Accrued Departures, and Negative Departure Limits are essentially unchanged, and the Compact Decree represents the same interstate compromise that the Compacting States struck before.

But there are differences between the First Decree and the Compact Decree. These changes include the removal of “Annual Allocated Water” and “Project Supply” as elements of accounting under the Compact Decree, the introduction of new accounting elements such as “Index Supply,” the removal of the New Mexico and Texas Escrow Accounts, the removal of provisions regarding the States’ option to implement balance transfers from one irrigation district to another under certain conditions, the removal of former Article III entitled “Project Operations to Enable Compact Compliance,” and the removal of various other ancillary references to Project operations and the United States. *Compare* Ex. 1, First Decree *with* Consent Decree, 8th Cir Doc. 720.

D. New Mexico’s Description Of The Negotiated Agreements

Texas and Colorado are not parties to any agreement except for the Compact Decree. However, New Mexico provides a description of other negotiated agreements it entered for context and background with respect to New Mexico’s resolution of various disputes.

In addition to the Compact Decree, New Mexico’s overall settlement involves three other principal agreements: (1) the Groundwater Settlement Agreement; (2) the Project Operations Settlement Agreement; and (3) the Third-Party Implementing Contract. These agreements fit together, and New Mexico would not have agreed to the settlement without the entire package of agreements. Ex. 6, Anderson Decl. ¶¶ 16-17. The Compact Decree provides New Mexico with a quantitative measurement (the EEPI) of Compact apportionments to New Mexico and Texas below the Reservoir, allowing it to assess its Compact compliance. *Id.* ¶¶ 20-21. The Groundwater Settlement Agreement, the Project Operations Settlement Agreement, and Third-Party Implementing Contract provide New Mexico with some of the tools New Mexico will need to ensure Compact compliance as measured by the EEPI. Ex. 11, Riseley-White Decl. ¶¶ 21-31.

1. Groundwater Settlement Agreement

The Groundwater Settlement Agreement addresses the United States’ claim that “[u]ncapped use of water below Elephant Butte Reservoir in New Mexico could reduce Project efficiency to a point where 43% of the available water could not be delivered to EPCWID, and 60,000 acre-feet per year could not be delivered to Mexico.” U.S. Compl. in Intervention ¶ 15, 8th Cir. Doc. 65. The agreement comprises three primary commitments.

First, New Mexico agrees to reduce depletions in the Lower Rio Grande by 18,200 acre-feet per year within ten years (Depletion Reduction). Ex. 8, Barroll Decl. ¶ 51. This Depletion Reduction will reduce the total depletion of groundwater to a level consistent with hydrological conditions during the D2 Period. *Id.* ¶¶ 51-52. Accordingly, this commitment is consistent with the Compact Decree, and New Mexico's actions to achieve the Depletion Reduction will improve the ability of New Mexico to satisfy the Index Delivery, which is also predicated on a D2 Period baseline. *Id.* Depletions at that level also ensure that New Mexico may receive the full benefits of its apportionment. Ex. 6, Anderson Decl. ¶ 22, 43.

The Groundwater Settlement Agreement generally requires New Mexico to achieve the Depletion Reduction by retiring groundwater rights. *Id.* ¶ 44; Ex. 10, Serrano Decl. ¶ C(1). To avoid disputes over the effect of permanently retiring groundwater rights, the agreement establishes assumed Depletion Reduction effects depending on the type of right retired. Ex. 6, Anderson Decl. ¶ 45. The agreement also establishes a static Depletion Reduction target rather than an ongoing (and potentially controversial) comparison of current depletions to those existing during the D2 Period. *Id.* ¶ 46. This compromise ensures transparency and consistency with the Compact Decree (and the D2 Period baseline) while reducing the possibility of future disputes. *Id.*; Ex. 10, Serrano Decl. ¶¶ 13-17.

The majority of the water rights New Mexico acquires for Depletion Reduction will be associated with Project lands that are irrigated by a combination of groundwater and Project surface water rights. Ex. 8, Barroll Decl. ¶ 54. When it acquires such rights, New Mexico intends to fallow the associated lands, retire the groundwater component of the water right, and use the surface water component for Transfers (which are described in greater detail below), as needed. *Id.* Fallowing irrigation land will reduce groundwater pumping and thus reduce depletive effects on the Rio Grande in a manner that supports New Mexico’s Compact compliance. *Id.* ¶ 57. The surface water rights that New Mexico acquires will be available to contribute to Transfers and reduce New Mexico’s Negative Accrued Departures under the EEPI, and if those rights are not needed for that purpose, they will be available to supply additional water to EBID for use on irrigated lands, thus reducing the need for groundwater pumping on those lands. *Id.*

Second, in addition to the Depletion Reduction obligation, the Groundwater Settlement Agreement contains provisions termed “Enforceable Hydrologic Conditions” to monitor the efficiency of Project surface water deliveries and aquifer storage conditions. Ex. 8, Barroll Decl. ¶ 58.

The United States and New Mexico will monitor Project efficiency through an annual calculation of the Upper Valley Diversion Ratio (UVDR). Ex. 8, Barroll

Decl. ¶ 59. VDR is a measure of Project surface water deliveries (to Project headings in New Mexico and to the El Paso Gage), as a function of the amount of water released from Reservoir. *Id.* If the three-year average UVDR drops below 0.79, then the United States may initiate formal consultation with New Mexico regarding water resource management. *Id.* A UVDR3 of 0.79 is meaningful because it approximates the lower bound of Project efficiency during the D2 Period. *Id.*

New Mexico and the United States will also monitor aquifer storage conditions under the Groundwater Settlement Agreement. The agreement provides for monitoring at several indicator wells and other monitoring wells. Ex. 8, Barroll Decl. ¶ 60. If groundwater level monitoring indicates that aquifer storage levels have dropped over a three-year period in which the surface water supply was greater than 400,000 acre-feet per year, then formal consultation between New Mexico and the United States will occur. *Id.*

These backstop Enforceable Hydrological Conditions help to ensure that New Mexico meets its delivery obligations under the Compact Decree. Ex. 5, Anderson Decl. ¶ 47. The Groundwater Settlement Agreement maintains New Mexico's discretion to administer water in the Lower Rio Grande to achieve compliance with the Enforceable Hydrological Conditions while providing the United States with meaningful opportunities for consultation. *Id.* ¶ 50. New

Mexico has sufficient administrative tools and options to satisfy these Enforceable Hydrological Conditions. *Id.* ¶ 49.

Third, New Mexico will adopt a Lower Rio Grande Water Management Plan (LRG Plan) within two years of the effective date of the Groundwater Settlement Agreement. The LRG Plan will describe New Mexico's plan to manage and administer water in the Lower Rio Grande. Ex. 8, Barroll Decl. ¶ 64. The LRG Plan will address implementation of Depletion Reduction, management actions needed to address issues related to UVDR and aquifer storage, general water rights management, and associated State Engineer Orders and rules. *Id.* The development of the LRG Plan gives New Mexico the opportunity to develop contingencies to address situations in which non-compliance with the Compact as measured by the EEPI is threatened. *Id.* ¶ 65. Such a situation is most likely to occur if climatic conditions cause consistently low surface water supply for the Project, so that the average surface water supply to the Project is lower than that of the D2 Period. *Id.*

Fulfillment of these provisions of the Groundwater Settlement Agreement will generally improve New Mexico's ability to comply with the EEPI, while addressing the United States' concerns with enforceable reductions in groundwater use in the First Decree.

2. Project Operations Settlement Agreement

The Project Operations Settlement Agreement is an agreement among New Mexico, the United States, and the irrigation Districts. It addresses several issues, including (a) revising Project water allocation and accounting procedures to address concerns raised by New Mexico and bring the Project operations into better alignment with the EEPI methodology, (b) providing a mechanism for New Mexico to order Transfers if needed to address Negative Accrued Departures, and (c) providing for Transfers from EPCWID to EBID as necessary to EBID to address Positive Accrued Departures. Ex. 8, Barroll Decl. ¶ 41.

The changes to Project operations in the Project Operations Settlement Agreement are modest because the Compact Decree is congruent with many of the basic principles underlying the 2008 Operating Agreement, including the D2 Period baseline. Ex. 8, Barroll Decl. ¶¶ 20, 44-45. The 2008 Project Operating Agreement already allocates water using a D2 Period baseline. *Id.* ¶ 20. The Project Operations Settlement Agreement requires a Modified D2 Equation (i.e., a two-year regression equation derived from the same data as the D2 Equation). This change harmonizes the Project allocation process with the EEPI methodology, which is also based on a two-year regression. *Id.* ¶ 44. The Project Operations Settlement Agreement also moves the charge point for delivery to EPCWID in the El Paso Valley from the current multiple locations in the El Paso Valley to the

American Dam, at the upstream end of the El Paso Valley. *Id.* ¶ 45. This change addresses many of New Mexico's concerns regarding Project accounting within the El Paso Valley and makes Project accounting more consistent with Index accounting under the Consent Decree. *Id.* Put very simply, moving the charge point ensures that each District is responsible only for the depletions occurring within its jurisdiction. Ex. 6, Anderson Decl. ¶ 26(a).

The Project Operations Settlement Agreement also provides New Mexico with a framework for making transfers with the cooperation of the United States and EBID. Ex. 8, Barroll Decl. ¶ 46-48. Transfers allow one District to transfer water to the other District through the operations of the Project to address over or under deliveries under the EEPI. *Id.* ¶ 72. The Compact Decree provides that these Transfers will result in an immediate adjustment in EEPI departures, so these mechanisms give New Mexico a valuable tool for Compact compliance. *Id.* ¶¶ 33-34, 84. The agreement puts in place rules and accounting procedures which provide New Mexico the ability to perform transfers when needed, while limiting impacts on the annual operations of the Districts. *Id.* ¶ 48. The Project Operations Settlement Agreement voluntarily agrees to modify Project operations to harmonize them with the EEPI as necessary to keep Project Allocations consistent with the Compact Decree. Ex. 6, Anderson Decl. ¶ 26(c). This mechanism for the

reallocation of water ensures that the division of water stays within the accepted limits of the 57:43 apportionment. *Id.* ¶ 26(d).

The Project Operations Settlement Agreement also provides for the resolution of several outstanding disputes concerning the Project in New Mexico. First and foremost, it provides for the dismissal of all claims of the United States, New Mexico, and the Districts in the Federal District Court litigation surrounding the 2008 Operating Agreement and the Project water right. Ex. 6, Anderson Decl. ¶ 35-37. The Project Operations Settlement Agreement also requires the United States, New Mexico, and EBID to jointly seek an amendment to several orders in New Mexico's lower Rio Grande adjudication. These amendments would:

- (a) establish a priority date of 1903 for administrable combined surface and groundwater diversions at the farm headgate of up to 3.024 acre-feet per acre per year for EBID members with administrable, combined surface water and supplemental groundwater rights; and
- (b) establish a priority date of 1903 for the Project (subject to a final ruling by the New Mexico Court of Appeals). *Id.* ¶¶ 29, 32. With these priority dates, EBID members and the Project would have some of the most senior water rights in the Lower Rio Grande, addressing many of the United States' concerns about Project interference and protecting an important agricultural community within New Mexico. *Id.* ¶¶ 30, 33.

The Project Operations Settlement Agreement is not a panacea. There are remaining intrastate issues in the Lower Rio Grande in New Mexico that must be addressed. Ex. 6, Anderson Decl. ¶¶ 38-39. The agreement provides a window until October 1, 2026, for good faith negotiations to resolve remaining adjudication and administration issues. *Id.* ¶ 40. If those negotiations are not successful, then New Mexico has administrative tools, including priority administration, to address the concerns of the other New Mexico amici in this case. *Id.* ¶ 39.

3. Miscellaneous Purposes Act Contract and Third-Party Implementing Contract

The Miscellaneous Purposes Act Contract and Third-Party Implementing Contract, coupled with the Operations Settlement Agreement, authorize and specify the procedures for implementing Transfers under the Compact Decree. The Miscellaneous Purposes Act Contract between Reclamation and EBID allows for the conversion of up to 100,000 acre-feet per year of irrigation water for other uses and allows EBID to enter into Third-Party Implementing Contracts. Ex. 10, Serrano Decl. ¶ D(1). Then, the Third-Party Implementing Contract between EBID and New Mexico's Interstate Stream Commission (ISC) specifies the terms and conditions upon which New Mexico may use up to 50,000 acre-feet per year of Project surface water for EBID Transfers. *Id.* ¶ D(2). There are specific limitations on the scale of such Transfers and provision for forbearance payments

to EBID for water converted to a Transfer. *Id.* ¶¶ D(4)-(6).¹³ These terms confirm that Transfers are a fair and reasonable mechanism for New Mexico to ensure that Texas receives its Compact apportionment as measured by the Index Delivery. *Id.* ¶ D(7).

VI. ARGUMENT

The Special Master should recommend that the Court grant this Joint Motion because the Compact Decree satisfies each of the elements of the *Firefighters* test: (1) the Compact Decree fully resolves the dispute among the Compacting States; (2) the Compact Decree is consistent with and furthers the objectives of the Rio Grande Compact by resolving ambiguities in apportionments; and (3) the Compact Decree is a fair and reasonable compromise.

A. The Compact Decree Fully Resolves The Compacting States' Dispute In A Manner Consistent With The Court's Article Iii Powers

“[A] consent decree must spring from and serve to resolve a dispute within the court's subject-matter jurisdiction.” *Firefighters*, 478 U.S. at 525. The Compact Decree satisfies this standard. First, it fully resolves the interstate dispute concerning apportionment under the Compact. Second, the Court has subject matter jurisdiction to resolve that dispute through the Compacting States' consent.

¹³ New Mexico's modelling suggests that such forbearance payments are likely to be rare because New Mexico will have available surface water allocations from lands on which it has retired groundwater to supply any needed Transfers in most scenarios. *See* Ex. 8, Barroll Decl. ¶ 75-82.

1. The Compact Decree Resolves the Interstate Dispute Concerning the Apportionment Under the Compact

The Court “will ordinarily give effect” to a consent decree “if it comes within the general scope of the case made by the pleadings.” *Pac. R. R. Co.*, 101 U.S. at 297. A consent decree must “spring from” and “resolve” the parties’ dispute. *Firefighters*, 478 U.S. at 525. The Compact Decree satisfies this requirement.

This case is about the equitable apportionment of water as between Texas and New Mexico below Elephant Butte Reservoir under the Compact.¹⁴ *See, e.g.*, Tex. Compl., 8th Cir. Doc. 63 (seeking relief under the Compact as against New Mexico); *Texas v. New Mexico*, 583 U.S. 407, 409 (2018) (“Texas claims that New Mexico has defied the Compact”); Mar. 31, 2020 Special Master Order 1, 8th Cir. Doc. 338 (“Inherent in these allegations is a fundamental disagreement as to Compact interpretation regarding the underlying equitable apportionment between the states[.]”).

¹⁴ In defining the scope of this litigation, the Special Master stated: “Today’s ruling reflects the view that the present action is not a forum for aggregating several individual claims addressing particular, potentially narrow errors in the management of the Rio Grande or attacking particular contracts for delivery of water.” Mar. 31, 2020 Special Master Order 1, 8th Cir. Doc. 338; *see also id.* at 29-30 (dismissing New Mexico’s counterclaim against the United States concerning the validity of the 2008 Operating Agreement as “beyond the scope of the current litigation”).

The Compact Decree resolves the interstate dispute. It specifies procedures to ensure that the equitable apportionment of Rio Grande water between Texas and New Mexico below Elephant Butte Reservoir, as established in the Compact, is attained. Compliance with the procedures set forth in the Compact Decree resolves Texas's claims against New Mexico and New Mexico's counterclaims against Texas. Both States' claims involve allegations that the other state took steps or failed to act to avoid interference with delivery or receipt of the equitable apportionment under the Compact. As described below, the Compact Decree resolves these claims by specifying methods and practices that will ensure delivery of each State's apportionment.

a. The Compact Decree Resolves Texas's Claims Against New Mexico

Texas seeks two types of Compact-related relief in its Complaint: (1) a declaration of its Compact apportionment and (2) an injunction against interference with Project operations to ensure that the Texas Compact apportionment can be delivered. The Compact Decree resolves both claims. Texas's Complaint also includes a prayer for relief in the form of monetary damages. While the Compact Decree does not include a monetary damages award in Texas's favor, it does include accelerated delivery make-up provisions in the form of water that New Mexico must supply in the event of excessive negative departures from the Index Obligation. *See* Ex. 1, Compact Decree § II(C).

The Compact Decree establishes the Index methodology, described at section V(A), *ante*, and in the declarations of Dr. Barroll, Dr. Hutchison, and Mr. Sullivan. The Index methodology requires New Mexico to ensure Texas’s apportionment of 43% of the water released from Caballo Dam, after accounting for deliveries to Mexico and the Texas portion of the Mesilla Basin, by annual measurement at the El Paso Gage. *See* Ex. 8, Barroll Decl. ¶¶ 24-27; Ex. 4, Hutchison Decl. ¶¶ 15-27. The Index establishes a measurement methodology analogous to the delivery mechanism that measures Colorado’s compliance with the Compact under Article III. *See* Ex. 8, Barroll Decl. ¶ 17. The Index methodology ensures compliance with the Compact and creates an operating framework for “departures” from the Index Obligation that allows New Mexico the latitude to make intrastate water administration decisions to ensure Texas receives its apportionment. *Id.* ¶¶ 29-32; Ex. 4, Hutchison Decl. ¶¶ 92-122, 129; *see* Ex. 7, Cotten Decl. ¶ 5.

Texas’s second claim, related to non-interference with Project operations, is directly linked to ensuring that Texas receives its apportionment. Texas’s second claim is also resolved by the Compact Decree. Under the Compact Decree, New Mexico must undertake additional water administration activities if its departures from the Index Obligation reach certain thresholds. *See* Ex. 4, Hutchison Decl. ¶¶ 116-122, 129; Ex. 8, Barroll Decl. ¶ 32 (describing EEPI operational triggers).

This provision reflects the States’ agreement that delivery of Texas’s Compact apportionment takes priority over the diversion and use of New Mexico’s state-based water rights. *See Hinderlider v. La Plata River & Cherry Creek Ditch Co.*, 304 U.S. 92, 106 (1938) (“The apportionment is binding upon the citizens of each State and all water claimants, even where the State had granted the water rights before it entered into the compact.”); *Wyoming v. Colorado*, 259 U.S. 419, 466 (1922), *decree vacated sub nom.* 353 U.S. 953 (1957) (“The river throughout its course in both States is but a single stream, wherein each State has an interest which should be respected by the other.”)

While the Compact Decree implements *Hinderlider* principles, it does so without interfering with state sovereignty. *See Tarrant Reg’l Water Dist. v. Herrmann*, 569 U.S. 614, 632-33 (2013) (where a compact is silent, the court will infer that a state retains its sovereign power to regulate its own waters). In other words, the Compact Decree directs New Mexico to undertake administration to meet the Index Obligation and cure Index Departures, but it does not reach into New Mexico’s decision-making about how to ensure state-based water rights are administered to achieve the goals of the Compact Decree. Ex. 6, Anderson Decl. ¶¶ 10-14, 23; *see* Ex. 7, Cotten Decl. ¶ 5. The fact that the Compact Decree preserves state sovereign rights to determine how to meet its interstate compact obligations is of critical importance to the Compacting States. Ex. 7, Cotten Decl.

¶¶ 5-10. Colorado writes separately to further highlight the importance of that aspect of the global resolution of this matter.

Finally, New Mexico is obligated under the Compact Decree to annually make accelerated delivery of water to Texas to make up for past under deliveries when accrued Index departures exceed 150,000 acre-feet (for the first five years, and 120,000 acre-feet thereafter). *See* Ex. 4, Hutchison Decl. ¶¶ 117-119. While this is not money damages, Texas prefers New Mexico to guarantee delivery of water and in “real time” when it likely will be needed most. Ex. 8, Barroll Decl. ¶ 31; Ex. 2, Skov Decl. ¶ 11.

b. The Compact Decree Resolves New Mexico’s Counterclaims Against Texas

As set forth above, the Compact Decree specifies procedures to ensure that the Compact equitable apportionment of Rio Grande water between Texas and New Mexico below Elephant Butte Reservoir is attained. *See* section V(B), *ante*.

Compliance with the procedures set forth in the Compact Decree resolve New Mexico’s counterclaims as against Texas because those counterclaims alleged actions taken by Texas. If the Court approves the Compact Decree, New Mexico’s counterclaims will be fully addressed for at least three reasons.

First, by defining a specific Compact apportionment to Texas, the Index also establishes the amount of water to which New Mexico is entitled under the Compact. Analysis of the Index using the Integrated Lower Rio Grande Model

indicates that release season diversions in New Mexico, over a 78-year projection period, would conform to a 57:43 apportionment as between New Mexico (below Elephant Butte Reservoir) and Texas. Ex. 9, Sullivan Decl. ¶ 25, 30. Accordingly, New Mexico is satisfied that compliance with the Index will ensure that New Mexico receives its Compact equitable apportionment of Rio Grande water below the Reservoir.

Second, because the Index is premised on hydrologic conditions and water use that were occurring during the D2 Period (*see* Ex. 6, Anderson Decl. ¶ 2), the Index incorporates and protects the conjunctive use of surface water and groundwater in both New Mexico and Texas in a manner necessary to support the Project. *See* Ex. 8, Barroll Decl. ¶¶ 23-28.

Third, by measuring deliveries to Texas at the El Paso Gage, after accounting for depletions in the Texas portion of the Mesilla basin, the Index methodology addresses New Mexico's concern that actions in Texas (including groundwater pumping) adversely impact Project performance and prevent New Mexico from receiving its Compact equitable apportionment. Ex. 9, Sullivan Decl. ¶ 14-15 Using the El Paso Gage as the measurement location causes Texas to bear the impact of changes to Project efficiency in Texas (e.g., the impact of reduced return flows due to groundwater pumping in the El Paso valley). *See* Ex. 4, Hutchison Decl. ¶ 128 (opining that the El Paso Gage is "located in an ideal

geographic, geologic, and hydrogeologic location to provide for a full accounting of all water delivered to Texas or used by Texas above the gage, and measure New Mexico's compliance with the EEPI Obligation").

2. The Court Has Appropriate Subject Matter Jurisdiction to Resolve the Dispute Through the Compact Decree

The Court must be satisfied that the Compact Decree comes within its subject matter jurisdiction. *Firefighters*, 478 U.S. at 525; *Vermont*, 417 U.S. at 277 (rejecting consent decree that would require the Court to "act[] more in an arbitral rather than judicial manner" as inconsistent with the Court's Article III functions). Here, there should be no doubt that resolving this dispute is within the Court's subject matter jurisdiction.

The Supreme Court has original and exclusive jurisdiction to resolve interstate disputes. 28 U.S.C. § 1251(a). The Court has emphasized that its "role in compact cases differs from [its] role in ordinary litigation," because its role in compact cases is to serve " 'as a substitute for the diplomatic settlement of controversies between sovereigns and a possible resort to force.' " *Texas*, 583 U.S. at 412 (quoting *Kansas*, 574 U.S. at 453). The Court explained that, as a result, it has a "unique authority" to " 'regulate and mould the process it uses in such a manner as in its judgment will best promote the purposes of justice.' " *Id.* (quoting *Kansas*, 574 U.S. at 454).

Consistent with that authority, the Court has recognized its power to resolve interstate disputes through consent or stipulation. In *New Hampshire v. Maine*, 426 U.S. 363, the Court accepted a proposed consent decree resolving a state boundary dispute. The proposed decree would define the phrase “middle of the river” from a 1740 decree of King George II of England to mean “the middle of the main channel of navigation.” *Id.* at 370-71. The issue was whether accepting the States’ compromise on this disputable question of fact and law was “consistent with [the Court’s] Art. III function and duty.” *Id.* at 369. The Special Master concluded that acceptance of the settlement would derogate the Court’s duty to decide, based on applicable legal principles, the precise boundary fixed by the 1740 document. The Court disagreed, ruling that Article III “does not proscribe the acceptance of settlements.” *Id.* at 369. The settlement need only be a “permissible final resolution of the controversy both as to facts and law.” *Id.* at 368-69. The Court may accept a settlement if it is not “wholly contrary to the relevant evidence.” *Id.* The Compact Decree clears this low bar. *See* section VI(C), *infra*.

The Compact Decree does not ask the Court to supervise administrative or arbitral functions outside of its ordinary judicial powers. The parties do not ask the Court to appoint a river master or oversee any administrative dispute resolution system as in *Vermont*, 417 U.S. at 277. Rather, the Court would maintain

jurisdiction over the Consent Decree for the sole purpose of adjudicating any future controversies concerning compliance or contempt. There is a well-established historical precedent for continuing jurisdiction for this limited purpose. *See, e.g., Kansas v. Nebraska*, 575 U.S. at 134, 135 (2015) (“The Court retains jurisdiction to entertain such further proceedings, enter such orders, and issue such writs as it may from time to time deem necessary or desirable to give proper force and effect to this Decree.”); *New Jersey v. New York*, 347 U.S. 995 (1954) (“This Court retains jurisdiction of the suit for the purpose of any order or direction of modification of this decree or any supplemental decree that it may deem at any time to be proper.”).

B. The Compact Decree Is Consistent With The Compact

Next, a consent decree in a compact enforcement action must be consistent with the compact. *See Kansas*, 574 U.S. at 472 (recognizing that the states, through settlement, “could not change the Compact's terms even if they tried”); *Vermont*, 417 U.S. at 278 (recognizing that “a conflict with an interstate compact” would defeat “settlement of this interstate dispute by agreement of the parties”); *accord Firefighters*, 478 U.S. at 525 (a consent decree must “further the objectives of the law upon which the complaint was based”). The Court should not “ ‘mechanically accept’ ” the parties’ stipulation but should determine whether the Compact Decree is consistent with a “plausible” reading of the Compact “without

determining the[] merits.” *See Lawrence v. Charter*, 516 U.S. 163, 171 (1996) (quoting *Mariscal v. United States*, 449 U.S. 405, 406 (1981) (Rehnquist, J., dissenting)) (concerning confessions of error). The Court may accept the Compact Decree as long as it is not “wholly contrary to the relevant evidence.” *New Hampshire*, 426 U.S. at 369.

Here, the Compact Decree is consistent with and furthers the objectives of the Compact. This is so for three reasons: (1) the Compact Decree uses the same methodology to apportion water beneath Elephant Butte Reservoir as above it; (2) the Compact Decree achieves a 57:43 division of water; and (3) the Compact Decree establishes a “baseline” that is consistent with historical practices.

1. The Compact Decree Utilizes the Same Methodology as Articles III and IV of the Compact

Article III of the Compact “defines Colorado’s state-line delivery obligation with reference to a schedule of relationships between flows at certain gages.” MSJ Order 13, 8th Cir. Doc. 503; Compact, art. III. Article IV is similar but defines New Mexico’s obligation to deliver water measured at Elephant Butte Reservoir. MSJ Order 14, 8th Cir. Doc. 503; Compact, art. IV. These articles create an “inflow-outflow regime” in the regions of the Rio Grande where they apply. MSJ Order 23, 8th Cir. Doc. 503. Downstream of Elephant Butte, the “Compact is programmatic in its division of water . . . referring simply to the

Project.” *Id.* at 24. As a result, the Compact does not “address expressly the full details of the Project’s baseline operating conditions[.]” *Id.*

The Compact Decree does not change New Mexico’s delivery obligation provided for in Article IV of the Compact. The Compact Decree merely provides for a measurement location below the Reservoir to ensure that Texas receives the quantity of Rio Grande water apportioned to it. This measurement was not possible in 1938. Article XII of the Compact, however, anticipates the Rio Grande Compact Commission’s ability to add measurement locations as those locations became necessary and feasible.

The Compact drafters considered requiring New Mexico to deliver water at the Texas-New Mexico state line and creating a similar inflow-outflow regime in the Project area in New Mexico, but they did not set forth express terms for doing so. First, they believed that it was “practically impossible” to measure state line flows due to the “irregular contour of the boundary between the two States” and the various “canals, laterals[,] and drains” crisscrossing the state line in the area upstream of the El Paso Gage. Letter from Frank B. Clayton to C.S. Clark 7, Trial Ex. JT-0458. Second, they felt that it would be unreasonable to expect New Mexico to guarantee specific amounts of water to pass the state line since Project releases were controlled by Reclamation. *Id.* Those facts posed an obstacle to the

administration of a delivery requirement below the Reservoir at the time, but not today.

The complexity of measuring water deliveries at the border is no longer an insurmountable problem. The proliferation of gaging stations as well as advanced computer modeling allow accurate measurement of water uses in Texas above the El Paso Gage. *See* Ex. 4, Hutchison Decl. ¶¶ 28-37; Ex. 8, Barroll Dec. ¶ 24.

Because uses above the El Paso Gage can now be split between New Mexico and Texas, the Texas portion can be added to flows at the El Paso Gage to determine the total amount of water actually delivered to Texas. Ex. 4, Hutchison Decl. ¶ 37; Ex. 8, Barroll Dec. ¶ 24. As a result, the States are now able to create an inflow-outflow methodology that provides certainty to the States' rights and obligations downstream of the Reservoir.

The reliance on the Project to deliver Texas's (and part of New Mexico's) apportionment is also no longer a problem preventing the Compacting States from adopting an inflow-outflow methodology below the Reservoir. The division of water in the Index is not new or novel. It merely provides a measurement for the 57:43 apportionment between southern New Mexico and Texas that has existed throughout the history of the Project. *See* Ex. 4, Hutchison Decl. ¶ 124; Ex. 8, Barroll Dec. ¶¶ 22, 26-28. The Index establishes an agreed-upon baseline for determining the amount of water apportioned 57:43 that can be accomplished

within normal Project operations. Ex. 9, Sullivan Decl. ¶ 30; Ex. 4, Hutchison Decl. ¶¶ 23-24, 124. Indeed, the 2008 Operating Agreement (and the new Project Operations Settlement Agreement, included in the global resolution of this case) use the same D2 Baseline as the Index. *See* Ex. 4, Hutchison Decl. ¶¶ 23-24, 124; Ex. 8, Barroll Decl. ¶ 20.

2. The Index Achieves a 57:43 Apportionment of Project Supply in Accordance with the Downstream Contracts

In ruling on the motions for summary judgment on the apportionment issue, the Special Master concluded the “Compact unambiguously establishes that:

(1) New Mexico receives part of its apportionment above the Reservoir and part below; (2) New Mexico’s downstream apportionment is delivered by the Project; and (3) New Mexico owes Texas a duty to not interfere with the Project’s delivery of Texas’s Compact Apportionment.” MSJ Order 46, 47, 8th Cir. Doc. 503. “The Compact and the inextricably intertwined Project and Downstream Contracts provide for the 57%/43% split.” *Id.* at 51.

The Index establishes a measurement target at the New Mexico-Texas border that ensures the water is divided between the States in accordance with this 57:43 apportionment. *See* Ex. 9, Sullivan Decl. ¶ 30. As described above, the States developed the Index using reservoir release and El Paso Gage flow data during a period, when, on average, 57% of the Project deliveries were used in New Mexico and 43% were used in Texas. By fixing authorized acreage, releases for

irrigation demands allowed in Article I(l) of the Compact result in the 57:43 apportionment of Project water supply. This division of water is consistent with the percentage of Project authorized acreage in each State, the normal operations of the Project that historically provided each Project acre with an equal entitlement to water, and with the Downstream Contracts. Accordingly, the Index quantifies the 43% of water to be delivered to Texas, with the remaining 57% of water used in New Mexico. Ex. 9, Sullivan Decl. ¶ 30.

3. The Compact Decree Establishes a “Baseline” Operating Condition that Is Consistent with Historical Practices

While the Special Master’s Summary Judgment Order concluded that the Compact calls for a 57:43 apportionment below the Reservoir, this determination “begs the question of division of what?” MSJ Order 6, 8th Cir. Doc. 503. The “Compact and the closely related Downstream Contracts together establish the 57%/43% split as a rough protected baseline division of Project deliveries as between New Mexico and Texas downstream of the Reservoir[.]” *Id.* But the Compact does not “address expressly the full details of the Project’s baseline operating conditions” *Id.* at 24.

Following lengthy settlement negotiations, the Compacting States have agreed to a Project baseline operating condition that aligns with historical practices. *See Tarrant Reg. Water Dist.*, 569 U.S. at 636 (“ ‘course of performance under the Compact is highly significant’ evidence of [the parties’] understanding of

the [C]ompact's terms") (quoting *Alabama v. North Carolina*, 560 U.S. 330, 346 (2010)).

Specifically, the Compact Decree establishes an Index methodology that calculates Texas's 43% share of Project supply in a manner that can be measured at a specific point—the El Paso Gage—to ensure each State receives its apportionment. *See* Ex. 9, Sullivan Decl. ¶ 30; Ex. 4, Hutchison Decl. ¶ 124; Ex. 8, Barroll Decl. ¶ 24. As Dr. Hutchison describes in his Declaration, the Index Obligation was developed based on an analysis of historic data from 1951 to 1978, known as the “D2 Period.” *See* Ex. 4, Hutchison Decl. ¶¶ 23-24, 73-80. The analysis included the quantitative relationship between Caballo Releases and Rio Grande at El Paso flow using regression analysis, factoring in estimated and calculated Rio Grande depletions in the Texas portion of the Mesilla Basin. *Id.* Dr. Hutchison also explains that the D2 Period was chosen because this period represented a time when, on average, 57% of the Rio Grande Project deliveries were used in New Mexico and 43% of the Rio Grande Project deliveries were used in Texas. Ex. 4, Hutchison Decl. ¶ 24. The D2 Period was also the basis for the 2008 Operating Agreement, which has formed the basis for Rio Grande Project operations for the last nearly 15 years. *Id.* The Index would continue that practice. The Index codifies the programmatic division of water in a manner consistent with the last nearly 50 years of Project operations. Ex. 8, Barroll Decl. ¶¶ 24-27.

Moreover, it does so without directly affecting the day-to-day operations of the Project. *Id.* ¶¶ 38-40.¹⁵

As in *New Hampshire*, the States’ agreement that the Compact apportionment is satisfied with the D2 Baseline is a reasonable interpretation that is not “wholly contrary to relevant evidence.” *New Hampshire v. Maine*, 426 U.S. at 369. Because the Compact Decree “merely ha[s] the effect . . . of reasonably investing” the Compact’s apportionment below the Reservoir with precise definition, the Court should honor the settlement agreement between the States “even if [the Court] would reach a different conclusion upon the same evidence.” *Id.*

C. **The Compact Decree Is A Fair And Reasonable Resolution To This Action**

Finally, courts consider whether the Compact Decree is a “fair, reasonable, and adequate resolution of the claims.” *Firefighters*, 478 U.S. at 512; *see also United States v. Oregon*, 913 F.2d 576, 580 (9th Cir. 1990). For this reason, the ordinary procedure prior to entry of a consent decree includes a “fairness hearing” at which interested third parties may comment on the advantages or disadvantages of a settlement. Larry Kramer, *Consent Decrees and the Rights of Third Parties*,

¹⁵ Indeed, the Compact Decree uses the same baseline as has been adopted by the United States in the operation of the Project. Ex. 4, Hutchison Decl. ¶ 24; Ex. 9, Sullivan Decl. ¶¶ 14-15.

87 Mich L. Rev. 321, 358 n.154 (1988) (citing authority from the First, Fifth, Sixth, and Seventh Circuits requiring fairness hearing procedures).

Here, the only “third party” on whose interests the questions regarding fairness and reasonableness turn is the United States. This is so because the United States is the only party that is not represented by the Compacting States. The equitable apportionments of water under the Rio Grande Compact belong “to the States, who represent their citizens *parens patriae* in this proceeding.” *Nebraska*, 325 U.S. at 616; *see also South Carolina v. North Carolina*, 558 U.S. 256, 274 (2010) (“[A] State’s sovereign interest in ensuring an equitable share of an interstate river’s water is precisely the type of interest that the State, as *parens patriae*, represents on behalf of its citizens.”); *Nebraska v. Wyoming*, 515 U.S. 1, 21 (1995) (“each State ‘must be deemed to represent all its citizens’ ”). The United States is not a party to the Compact or the Compact Decree, but the Court permitted it to intervene in this action “to defend ‘distinctively federal interests.’ ” *Texas v. New Mexico*, 583 U.S. at 413 (quoting *Maryland v. Louisiana*, 451 U.S. 725, 745 n.21 (1981)).

The Compact Decree is fair and reasonable because it addresses concerns raised by the United States with respect to the First Decree. The fundamental problem for which the Court declined to enter the First Decree was the improper dismissal of the United States’ claims. *Texas v. New Mexico*, 602 U.S. at 963. The

Court reasoned that the Court could not “approve” a consent decree “over the United States’ objection.” *Id.* That objection is no longer an impediment to the settlement because the United States does not object to the Consent Decree. The Consent Decree does not dispose of the United States’ claims, and the United States stipulates to the dismissal of its Complaint in Intervention pursuant to the Motion to Dismiss of even date with the Joint Motion. The United States’ position indicates that the settlement agreement fairly, adequately, and reasonably addresses the federal interests embodied in its pleading. The United States’ concerns with the First Decree are adequately addressed by the revisions that are reflected in the Compact Decree and the various negotiated agreements among the United States, New Mexico, and the Districts.

The United States has stated that the Compact Decree is consistent with the Compact and it will not contest its adoption by the Court. The United States has further, based upon the referenced negotiated agreements with New Mexico and others regarding operations and actions primarily within New Mexico, moved to dismiss its claims in this action with prejudice. Consequently, the United States may not challenge the Consent Decree as being inconsistent with the Compact in any future action.

VII. CONCLUSION

For the foregoing reasons, the Compacting States respectfully request that the Special Master recommend the entry of the Compact Decree attached hereto as Exhibit 1 to the Court and memorialize such recommendation in a written report to the Court.

Respectfully submitted,

By: /s/ Stuart L. Somach

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No. 141, Original

In the

SUPREME COURT OF THE UNITED STATES

STATE OF TEXAS,

Plaintiff,

v.

STATE OF NEW MEXICO and
STATE OF COLORADO,

Defendants.

OFFICE OF THE SPECIAL MASTER

**COMPENDIUM OF EXHIBITS
IN SUPPORT OF THE JOINT MOTION OF THE STATE OF
TEXAS, STATE OF NEW MEXICO, AND STATE OF
COLORADO TO ENTER COMPACT DECREE
SUPPORTING THE RIO GRANDE COMPACT**

August 29, 2025

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The State of Texas, State of New Mexico, and State of Colorado
(Collectively, “Compacting States”), hereby submit the following Exhibits
in support of the Joint Motion of the State of Texas, State of New Mexico,
and State of Colorado to Enter Compact Decree Supporting the Rio Grande
Compact filed August 29, 2025.

COMPENDIUM OF EXHIBITS

EXHIBIT NO.	DESCRIPTION
EXHIBIT 1	Consent Decree Supporting the Rio Grande Compact Appendix 1: Effective El Paso Index – Consent Decree Supporting the Rio Grande Compact Appendix 2: Map - Rio Grande Basin above Fort Quitman Gage
EXHIBIT 2	Declaration of Texas Rio Grande Compact Commissioner Robert Scott Skov in Support of the Joint Motion of the State of Texas, State of New Mexico, and State of Colorado to Enter Compact Decree Supporting the Rio Grande Compact Exhibit A: Resolution of the Rio Grande Compact Commission Regarding the Proposed Compact Decree in Original Action No. 141 <i>Texas v. New Mexico and Colorado</i>, in the United States Supreme Court (August 22, 2025)

EXHIBIT NO.	DESCRIPTION
EXHIBIT 3	Declaration of Texas Rio Grande Compact Commissioner Engineer Adviser Sue Ellyn “Suzy” Summers Valentine, P.E., C.F.M., in Support of the Joint Motion of the State of Texas, State of New Mexico, and State of Colorado to Enter Compact Decree Supporting the Rio Grande Compact
EXHIBIT 4	Declaration of William R. Hutchison, Ph.D., P.E., P.G., in Support of the Joint Motion of the State of Texas, State of New Mexico, and State of Colorado to Enter Compact Decree Supporting the Rio Grande Compact Attachment A: William R. Hutchison, Ph.D., P.E., P.G. Resume (August 2025) Attachment B: EEPI Excel Spreadsheet
EXHIBIT 5	Declaration of Scott A. Miltenberger, Ph.D., in Support of the Joint Motion of the State of Texas, State of New Mexico, and State of Colorado to Enter Compact Decree Supporting the Rio Grande Compact Attachment A: Scott A. Miltenberger Resume
EXHIBIT 6	Declaration of Elizabeth K. Anderson, P.E., in Support of Joint Motion of the State of Texas, State of New Mexico, and State of Colorado for Entry of Decree Supporting the Rio Grande Compact Exhibit A: Elizabeth K. Anderson, P.E., Resume Exhibit B: Subfile Order and Final Judgment in SSI 104

EXHIBIT NO.	DESCRIPTION
EXHIBIT 7	Declaration of Craig W. Cotten, P.E., in Support of Joint Motion of the State of Texas, State of New Mexico, and State of Colorado for Entry of Compact Decree Supporting the Rio Grande Compact
EXHIBIT 8	Declaration of Margaret Barroll, Ph.D., in Support of Joint Motion of the State of Texas, State of New Mexico, and State of Colorado for Entry of Compact Decree Supporting the Rio Grande Compact Attachment: Margaret Barroll, Ph.D., Resume
EXHIBIT 9	Declaration of Gregory K. Sullivan, P.E., in Support of Joint Motion of the State of Texas, State of New Mexico, and State of Colorado for Entry of Compact Decree Supporting the Rio Grande Compact Attachment: Gregory K. Sullivan, P.E., Resume
EXHIBIT 10	Declaration of Ryan J. Serrano in Support of Joint Motion of the State of Texas, State of New Mexico, and State of Colorado for Entry of Compact Decree Supporting the Rio Grande Compact
EXHIBIT 11	Declaration of Hannah Riseley-White in Support of Joint Motion of the State of Texas, State of New Mexico, and State of Colorado for Entry of Compact Decree Supporting the Rio Grande Compact.

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EXHIBIT 1

CONSENT DECREE SUPPORTING
THE RIO GRANDE COMPACT
(WITH APPENDICES 1 AND 2)

No. 141, Original

In the
SUPREME COURT OF THE UNITED STATES

STATE OF TEXAS,

Plaintiff,

v.

STATE OF NEW MEXICO and
STATE OF COLORADO,

Defendants.

OFFICE OF THE SPECIAL MASTER

**CONSENT DECREE SUPPORTING
THE RIO GRANDE COMPACT**

DECREE

Based upon the Recommendation of the Special Master, with the agreement of the Compacting States of Texas, New Mexico, and Colorado, the Court decrees as follows:

The Texas-New Mexico Compact dispute among the Compacting States of Texas, New Mexico, and Colorado regarding Compact apportionment is resolved pursuant to the Decree terms described herein.

I. DEFINITIONS

When used in this Decree and the attachments and appendices hereto, the following definitions apply. The terms defined below shall be construed as consistent with the terms defined in the Rio Grande Compact.

“Accrued Index Departure” means the sum of all Annual Index Departures as defined in more detail in Appendix 1. This may result in an Accrued Negative Departure or an Accrued Positive Departure.

“Annual Index Departure” means the difference between the Index Delivery and the Index Obligation in any calendar year as described in Appendix 1. This may result in an Annual Negative Departure (under-delivery) or an Annual Positive Departure (over-delivery).

“Bureau of Reclamation” or **“Reclamation”** means the Bureau of Reclamation within the United States Department of the Interior.

“Caballo Release” means the official flow record as measured at the Rio Grande Below Caballo Dam stream gage (USGS 08362500) used in calculating the Index Obligation.

“Compact” means the Rio Grande Compact, approved by Congress in the Act of May 31, 1939, ch. 155, 53 Stat. 785.

“Convention of 1906” means the Convention Between the United States and Mexico Providing for the Equitable Distribution of the Waters of the Rio Grande for Irrigation Purposes, May 21, 1906, U.S.-Mex., 34 Stat. 2954.

“D2 Period” means the period January 1, 1951, through December 31, 1978.

“Depletion of Index Supply” means the annual volumetric reduction of Project Supply in New Mexico and Texas, in acre-feet, resulting directly or indirectly from surface water use and groundwater use.

“Effective El Paso Index” or **“EEPI”** or **“Index”** means the index-based methodology for assessing compliance with this Decree described in Appendix 1.

“El Paso Gage” means the Rio Grande at El Paso, Texas stream gage (USGS 08364000).

“Excess Flow” means Rio Grande streamflow at the El Paso Gage, excluding the delivery to Mexico, that is excluded from the Index Delivery as defined in Appendix 1.

“Index Accounting” means the determination of the Annual Index Obligation, annual Index Delivery, and annual and Accrued Index Departures as described in Appendix 1.

“Index Delivery” means the sum of:

- (i) the annual streamflow at the El Paso Gage, after subtracting delivery to Mexico and Excess Flow; and
- (ii) the estimated Depletion of Index Supply caused by groundwater and surface water use in the Texas Mesilla, as determined by the methodology in Appendix 1.

“Index Departure” or **“Departure”** means the difference between the Index Delivery and the Index Obligation; when the Index Delivery is greater than the Index Obligation it is a “Positive Departure,” when the Index Delivery is less than the Index Obligation it is a “Negative Departure.”

“Index Obligation” means the volume of water calculated to be delivered to Texas as quantified using the EEPI, and subject to Index Departures and other provisions in this Decree.

“Mesilla Basin” means the part of the Rio Grande Basin that contains the Mesilla Valley. The Mesilla Basin is located in both New Mexico and Texas, as depicted in Appendix 2.

“Project Carryover Water” means the quantity of water allocated each water year by Reclamation for delivery to the irrigation districts in New Mexico and Texas that remains at the end of each calendar year.

“Index Supply” means the water supply for the Rio Grande Project as defined and administered by applicable State law. Index Supply generally consists of:

Usable Water, as defined in Article I(*I*) of the Compact, which excludes Rio Grande credit water and imported waters such as San Juan Chama Project water;

Usable Water released from Caballo Reservoir in accordance with irrigation demands, including deliveries to Mexico; and

Inflows and Project return flows that reach the bed of the Rio Grande or Project conveyances, but excluding flows from imported water.

“Rincon Basin” means the part of the Rio Grande Basin that contains the Rincon Valley in New Mexico, as depicted in Appendix 2.

“Rio Grande Project” or **“Project”** means the federal reclamation project, authorized in the Reclamation Act of June 17, 1902, 32 Stat. 390 and the Rio Grande Project Act of February 25, 1905, 33 Stat. 814, operated by the United States through the Bureau of Reclamation and irrigation districts located in New Mexico and Texas.

“Texas Mesilla” means the land in the State of Texas that overlies the Mesilla Basin, as depicted in Appendix 2.

“Transfers” means the transfer of Project allocation between the Rio Grande Project irrigation district in New Mexico and the Rio Grande Project irrigation district in Texas in accordance with this Decree.

II. INJUNCTION

A. General Provisions:

1. The Rio Grande Compact effects an equitable apportionment of the waters of the Rio Grande above Fort Quitman, Texas, among the States of Colorado, New Mexico, and Texas. The Compacting States must comply with the Compact.
2. Pursuant to Article IV of the Compact and the unanimous Resolution of the Rio Grande Compact Commission adopted February 14-16, 1948, New Mexico is obligated to deliver Rio Grande water as measured at Elephant Butte Reservoir in amounts that are based on flows measured at the stream gaging station located at Otowi Bridge near San Ildefonso.

3. Elephant Butte Reservoir is the major storage reservoir for the Rio Grande Project.
4. The division of Rio Grande water between New Mexico and Texas below Elephant Butte Reservoir is based upon the percentage of the total authorized irrigable acreage of the Rio Grande Project situated in each State at the time of the Compact, approximately 57% in New Mexico and 43% in Texas.
5. This Decree specifies procedures to ensure the proper apportionment of Rio Grande water between Texas and New Mexico below Elephant Butte Reservoir.
6. Compliance with this Decree represents compliance with the Compact with respect to the division of Rio Grande water below Elephant Butte Reservoir.

B. Division of Water Below Elephant Butte Reservoir:

1. The procedures for calculating the water to be delivered to Texas at the El Paso Gage are contained in the Effective El Paso Index documented in **Appendix 1.**
2. The Effective El Paso Index:
 - a. New Mexico shall manage and administer water in a manner that is consistent with this Decree, including satisfying the Effective El Paso Index requirements.
 - b. The Index is the calculation of Rio Grande water that Texas is entitled to receive. New Mexico is entitled to use the balance of

the Rio Grande water released from Caballo Dam so long as its use complies with the other provisions of this Decree.

- c. The Index was developed to ensure Texas and New Mexico receive the amounts of water each is entitled to under the Compact below Elephant Butte Reservoir based upon Project operations during the D2 Period.
- d. The methodology for calculating and determining the Index Delivery and Index Obligation is documented in **Appendix 1**.
- e. The Index Obligation is calculated annually and is based on a regression analysis of Caballo Releases and volumes of water reaching the El Paso Gage during the D2 Period, plus the historical D2 Period average agricultural and domestic, commercial, municipal, and industrial (DCMI) depletions to the Rio Grande caused by surface and ground water use in the Texas Mesilla, upstream of the El Paso Gage, subtracting out deliveries to Mexico. The Index Obligation is described in detail in **Appendix 1**.
- f. The Index Delivery should equal the Index Obligation. However, river operations, hydrologic conditions, annual variations in the amount and location of water uses (including groundwater pumping) above the El Paso Gage, the distance between the release of Project water below Caballo Dam and the El Paso Gage and other factors may affect the Index Delivery. As a consequence,

this Decree provides for departures from the Index Obligation, and “triggers” for water management responses.

- g. The Rio Grande Below Caballo Dam and El Paso gages are used for providing the official daily flow record for use in calculating the Index Delivery. The gages will continually meet the Rules and Regulations for administration of the Rio Grande Compact regarding gaging stations. Colorado shall not be responsible for the costs of the gages and measurements needed for Index Accounting.

3. Index Departures:

- a. As set forth in this Decree, an Annual Negative Departure:
 - (i) will be used to reduce an Accrued Positive Departure at the beginning of the year by the amount of the Annual Negative Departure; or
 - (ii) will be added to the Accrued Negative Departures at the beginning of the year.
- b. As set forth in this Decree, an Annual Positive Departure:
 - (i) will be used to reduce an Accrued Negative Departure at the beginning of the year by the amount of the Annual Positive Departure; or
 - (ii) will be added to the Accrued Positive Departures at the beginning of the year.

- c. Transfers relating to Accrued Negative or Accrued Positive Departures from one irrigation district to the other will immediately reduce New Mexico's Accrued Negative Departures or Texas's Accrued Positive Departures by the same amount of the Transfer. Specifically, if such a Transfer occurs from the current-year allocation for the New Mexico irrigation district to the current-year allocation for the Texas irrigation district, then simultaneous with the Transfer, the Accrued Negative Departures will be reduced by an amount equal to the transfer. Likewise, if such a Transfer occurs from the current-year allocation for the Texas irrigation district to the current-year allocation for the New Mexico irrigation district, then simultaneous with the Transfer, the Accrued Positive Index Departure will be reduced by an amount equal to the Transfer.

C. **Index Departure Limits:**

1. New Mexico is in compliance with this Decree if New Mexico is within the Accrued Negative Departure limits. Exceedance of Accrued Negative Departure limits means New Mexico is in violation of this Decree.
2. Cap on Annual Positive Departure. The maximum Annual Positive Departure is 67,500 acre-feet; an Annual Positive Departure in excess of

67,500 acre-feet shall be treated as the equivalent of 67,500 acre-feet for the purposes of calculating Accrued Index Departures.

3. Caps on Annual Negative Departure.
 - a. For the first full five (5) calendar years following entry of this Decree, in calculating the Accrued Index Departures, Annual Negative Departures in excess of 112,500 acre-feet shall be treated as the equivalent of 112,500 acre-feet.
 - b. Beginning the sixth full calendar year after entry of this Decree, and thereafter, in calculating the Accrued Index Departures, Annual Negative Departures in excess of 90,000 acre-feet shall be treated as the equivalent of 90,000 acre-feet.
4. Negative Departures:
 - a. Limits:
 - (i) For the first full five (5) calendar years following entry of this Decree, New Mexico may accrue Negative Departures up to, but not in excess of 150,000 acre-feet.
 - (ii) Beginning the sixth full calendar year after entry of this Decree, and thereafter, New Mexico may accrue Negative Departures up to, but not in excess of 120,000 acre-feet.
 - b. Additional Index adjustments for exceedances of the Accrued Negative Departure limit:
 - (i) In addition to the other provisions of this Decree, if New Mexico exceeds the Accrued Negative Departure limit of

150,000/120,000 acre-feet in three (3) consecutive years, New Mexico shall provide 12,000 acre-feet of water in excess of its Index Obligation for each year that it exceeds the Accrued Negative Departure limit. New Mexico shall have three (3) years to provide the full 36,000 acre-feet.

- (ii) If New Mexico exceeds the Accrued Negative Departure limit of 150,000/120,000 acre-feet in four (4) or more consecutive years, New Mexico shall provide 15,000 acre-feet of water in excess of its Index Obligation for each additional year over the three (3) years addressed in the above paragraph that it exceeds the Accrued Negative Departures limit. The 15,000 acre-feet in excess of Index Obligation amounts shall be provided during the year immediately following the violation of the Accrued Negative Departure limit.

- c. In any year in which the three-year rolling average of the end of year Project Carryover Water for the irrigation district in Texas is greater than 180,000 acre-feet, all Accrued Negative Departures shall be extinguished.

D. Trigger for Water Management Actions:

- 1. To avoid excessive Accrued Index Departures and to ensure that the equitable apportionment is achieved, certain volumes of accrued Negative Departures (Trigger) require the following water management actions.

2. Negative Departure Trigger. If Accrued Negative Departures are greater than 80,000 acre-feet at the end of any calendar year, the following provisions shall apply:
 - a. New Mexico shall take water management actions to reduce the Accrued Negative Departures to less than 16,000 acre-feet within six (6) calendar years following the exceedance of the Negative Departure Trigger. New Mexico shall have discretion to determine what water management actions are necessary and appropriate.

E. Additional Index Provisions:

1. Scope of the Index Obligation. In addition to the above specific terms and conditions related to the Index:
 - a. The EEPI shall not apply in those years in which annual Caballo Releases are less than 200,000 acre-feet. In those years, the Annual Index Departure shall be set at zero (0) acre-feet.
 - b. When annual Caballo Releases are 790,000 acre-feet or greater, the Index Obligation shall be calculated using a 790,000 acre-foot release for the year.
2. If there is an Accrued Index Departure at the end of the fifth year following entry of this Decree, or if the Trigger is reached pursuant to paragraph II.D.2 in the first five (5) years, then the Accrued Index Departures (either Positive or Negative) shall be reduced by the amount of the Index Departure up to, but not to exceed, 20,000 acre-feet or until the Index Accounting reflects zero (0) Index Departures.

3. Aridity adjustment. The Index will be adjusted annually for estimated change, since the D2 Period, in open water evaporation and riparian evapotranspiration between the Rio Grande Below Caballo Dam and the El Paso gages. *See Appendix 1.*
4. In any year in which an actual or hypothetical spill occurs, as determined by the Rio Grande Compact Commission, all Accrued Index Departures, both Positive and Negative Departures, shall be extinguished.

F. Index Accounting:

1. The Compacting States shall cooperate in providing necessary data to support calculation of the Index Obligation and the Index Accounting as described in the attached **Appendix 1**.
 - a. The data required for calculating the initial Index Accounting for the prior year shall be reported to the Engineer Advisors for the Compacting States following the Compact accounting schedules in the “Schedule for Review and Approval of Rio Grande Compact Accounting Records for the Previous Year.”
 - b. The initial Index Accounting for the prior year shall be annually prepared using the methodologies contained in **Appendix 1** and provided in the “Schedule for Review and Approval of Rio Grande Compact Accounting Records for the Previous Year.”
 - c. The Engineer Advisors shall review the initial Index Accounting, and include the final Index Accounting for the prior year in their annual report to the Rio Grande Compact Commission.

- d. The Rio Grande Compact Commission shall review the Engineer Advisors' report and act as provided for in Article XII of the Compact.

III. CONSTRUCTION OF THE DECREE

- A. Nothing in this Decree as a whole, nor any part hereof, modifies or otherwise requires modification of the Compact. This Decree clarifies but does not alter the Compact rights and obligations of the signatory States.
- B. Nothing in this Decree shall be construed as affecting the obligations of the United States of America to Mexico under existing treaties, or to the Indian Tribes, or as impairing the rights of the Indian Tribes.
- C. The following appendices are attached:

“Appendix 1” is the Index Appendix; and

“Appendix 2” is a map showing the Mesilla Basin, the Rincon Basin, and the Texas Mesilla area.

To the extent any conflict exists between the language of this Decree and the appendices, or any ambiguity is created by the language of the appendices, the language in this Decree controls. The Compact and Decree govern the legal rights and obligations of the Compacting States. The technical appendices provide procedures and methodologies for ensuring proper implementation of this Decree.

- D. This Decree creates no third-party beneficiaries, express or implied.

IV. MODIFICATION OF APPENDICES TO THE DECREE

Appendices may be modified only by unanimous agreement of the Compacting States or subsequent order of this Court.

V. RETENTION OF JURISDICTION

Any of the Compacting States may file a motion with the Court for amendment of the Decree or for further relief. The Court retains jurisdiction of this suit for the purpose of any order, direction, or modification of the Decree, or any supplementary decree, that may at any time be deemed proper in relation to this Decree or an action by the Compacting States for the enforcement of the Decree.

APPROVED AS TO FORM:

/s/ Stuart L. Somach
STUART L. SOMACH
Counsel for the State of Texas

Dated: August 29, 2025

/s/ Jeffrey J. Wechsler
JEFFREY J. WECHSLER
Counsel for the State of New Mexico

Dated: August 29, 2025

/s/ Chad M. Wallace
CHAD M. WALLACE
Counsel for the State of Colorado

Dated: August 29, 2025

THE SPECIAL MASTER HEREBY RECOMMENDS THE ABOVE DECREE:

Dated: _____

Honorable D. Brooks Smith
Special Master
United States Circuit Judge
1798 Plank Road, Suite 203
Duncansville, PA 16635
Tel: 814-693-0570
chambers_of_judge_d_brooks_smith@ca3.uscourts.gov

APPENDIX 1

Appendix 1

Effective El Paso Index

Consent Decree Supporting the Rio Grande Compact

Section 1: Introduction

The Effective El Paso Index (EEPI) is an index-based methodology used to assess compliance with the Consent Decree Supporting the Rio Grande Compact (Consent Decree or Decree). The EEPI was developed for the purpose of quantifying and assessing the division of Rio Grande water below Elephant Butte Reservoir. This document provides a summary of the EEPI methodology and describes the procedures for calculating the elements included within the EEPI. Defined terms in the Consent Decree have the same meaning in this Appendix.

To the extent this Appendix presents any inconsistencies with the Consent Decree, the Consent Decree controls.

The EEPI includes provisions for calculating the annual calendar year volume of water obligated to Texas (*Index Obligation*), the annual volume of water delivered to Texas (*Index Delivery*), and the difference between the delivery and obligation, both on an annual and accrued basis (*Annual Index Departure* and *Accrued Index Departure*).

The EEPI methodology consists of the following:

- *Index Obligation* described in Section 2.
- *Index Delivery* described in Section 3.
- *Annual Index Departure* described in Section 4.
- *Accrued Index Departure* described in Section 5.
- *Data for EEPI Calculations* described in Section 6.
- *Consent Decree Accounting Provisions* described in Section 7.
- *Review and Revision* described in Section 8.

The Effective El Paso Index Supply (*Index Supply*) represents the Texas apportionment of the Rio Grande below Caballo Dam (see Section 2.1). It is comprised of the Rio Grande flows delivered at the *El Paso Gage* plus the depletions to the Rio Grande resulting from agricultural and domestic, commercial, municipal and industrial (*DCMI*) water uses in the *Texas Mesilla*¹

¹ *Texas Mesilla* means the land in the State of Texas that overlies the Mesilla Basin.

upstream of the *El Paso Gage*², adjusted for *Excess Flows*³ and *Delivery to Mexico at the Acequia Madre*⁴ as follows:

$$\begin{aligned} \text{Index Supply} = & + \text{Streamflow at the El Paso Gage} \\ & + \text{Texas Mesilla Agricultural Depletions} \\ & + \text{Texas Mesilla DCMI Depletions} \\ & - \text{Delivery to Mexico at the Acequia Madre} \\ & - \text{Excess Flow} \end{aligned}$$

Section 2: Index Obligation

2.1 Definition of the Index Obligation

The *Index Obligation* is the annual target volume of water calculated for delivery to Texas, subject to adjustment for changes in open water evaporation and riparian evapotranspiration (*Aridity Adjustment*) and other provisions.

The *Index Obligation* is based on a two-year regression analysis relating annual *Caballo Release*⁵ in the current and previous years to the annual *Index Supply* during the 1951-1978 period (*D2 Period*).

2.2 Calculation of the Index Obligation

The following equation (*Equation 1*) will be used to compute the *Index Obligation*, in units of acre-feet, following the end of each calendar year:

² *El Paso Gage* means the Rio Grande at El Paso, Texas stream gage (USGS 08364000).

³ *Excess Flow* defined in Section 3.6.

⁴ *Acequia Madre* is the canal through which deliveries of Rio Grande water are made to Mexico under the provisions of the Convention of 1906 between the United States and Mexico. The “Convention of 1906” means the Convention Between the United States and Mexico Providing for the Equitable Distribution of the Waters of the Rio Grande for Irrigation Purposes, May 21, 1906, U.S.-Mex, 34 Stat. 2954.

⁵ *Caballo Release* means the official flow record as measured at the Rio Grande Below Caballo Dam stream gage (USGS 08362500).

Equation 1

$$\begin{aligned} \text{Index Obligation [y]} = & 0.485886 \cdot \text{Minimum } (Q_{\text{Caballo [y]}; 790,000 \text{ acre-feet}) \\ & + 0.113382 \cdot \text{Minimum } (Q_{\text{Caballo [y-1]}; 790,000 \text{ acre-feet}) \\ & - 90,149 \\ & + 26,860 \text{ (Average Texas Mesilla Agricultural Depletions, in} \\ & \text{acre-feet)} \\ & + 12,224 \text{ (Average Texas Mesilla DCMI Depletions, in acre-feet)} \end{aligned}$$

Where,

- 0.485886, 0.113382, and 90,149 are regression coefficients.
- Q_{Caballo} is the annual **Caballo Release** for a given calendar year in acre-feet.
- $[y]$ indicates the year (e.g., $Q_{\text{Caballo [1970]}}$ is the annual **Caballo Release** for 1970).

The annual calculation of the **Index Obligation** is subject to the following conditions:

- In extreme wet years, or when Q_{Caballo} is greater than 790,000 acre-feet per year, the **Index Obligation** will be determined using *Equation 1*, but the value for Q_{Caballo} will be set to 790,000 acre-feet.

Data for Q_{Caballo} will be obtained from the Rio Grande Below Caballo Dam stream gage, which is operated and maintained by the United States Bureau of Reclamation (Reclamation).

Furthermore, the **Index Obligation** will be adjusted to account for any estimated change, since the D2 Period, in open water evaporation and riparian evapotranspiration between the Rio Grande Below Caballo Dam stream gage and the **El Paso Gage** using the following equation (*Equation 2*):

Equation 2

$$A [y] = 47,137 \cdot (1.0 - (ET_o [y] / ET_o [D2])) \cdot (67/155)$$

Where,

- 47,137 is the average open water evaporation and riparian evapotranspiration during the **D2 Period**, in acre-feet.
- $A [y]$ is the calculated **Aridity Adjustment** to the **Index Obligation** for each calendar year in acre-feet.
- $ET_o [y]$ is the five-year running average of annual calendar year reference evapotranspiration (ET_o) for the five-year period ending in year $[y]$ in inches per year, computed using the original Blaney-Criddle method and climate data (see Section 6) from the Leyendecker II PSRC weather station, located at the New Mexico State University Leyendecker Plant Science Research Center. If climate data from Leyendecker II PSRC weather station is unavailable, the best available data should be used.

- $ET_o[D2]$ is the average annual calendar year reference evapotranspiration (ET_o) over the **D2 Period** in inches per year, computed using the original Blaney-Criddle method, equal to 53.0 inches per year.
- **67/155** is the adjustment factor that represents the Texas portion of the *Aridity Adjustment*.
- $[y]$ indicates the year (e.g., $ET_o[1970]$ refers to annual reference evapotranspiration in 1970).

The calculated annual open water evaporation and riparian evapotranspiration adjustment value ($A[y]$), whether negative or positive, will be added to the **Index Obligation**. A one-inch difference in the $ET_o[y]$ as compared to the $ET_o[D2]$ represents an adjustment of about 384 acre-feet per year.

Section 3: Index Delivery

3.1 Definition and Calculation of the Index Delivery

The **Index Delivery** is the sum of:

- The annual streamflow at the **El Paso Gage**, after subtracting **Delivery to Mexico at the Acequia Madre** and **Excess Flow**; and
- The estimated depletion of **Index Supply** caused by groundwater and surface water use in the **Texas Mesilla**.

The following equation (*Equation 3*) will be used to compute the **Index Delivery**, in units of acre-feet, following the end of each calendar year:

Equation 3

$$\begin{aligned} \text{Index Delivery } [y] &= \text{Streamflow at the El Paso Gage } [y] \\ &\quad + \text{Texas Mesilla Agricultural Depletions } [y] \\ &\quad + \text{Texas Mesilla DCMI Depletions } [y] \\ &\quad - \text{Delivery to Mexico at the Acequia Madre } [y] \\ &\quad - \text{Excess Flow } [y] \end{aligned}$$

Where,

- **Streamflow at the El Paso Gage** as described in Section 3.2.
- **Texas Mesilla Agricultural Depletions** as described in Section 3.3.
- **Texas Mesilla DCMI Depletions** as described in Section 3.4.
- **Delivery to Mexico at the Acequia Madre** as described in Section 3.5.
- **Excess Flow** as described in Section 3.6.

3.2 Streamflow at the El Paso Gage

The annual calendar year streamflow at the *El Paso Gage* component of *Equation 3* will be based on the official daily flow record for the *El Paso Gage*, in units of acre-feet.

The *El Paso Gage* is operated and maintained by the U.S. Section of the International Boundary and Water Commission (US-IBWC) and the official record of daily flow is maintained by US-IBWC.

3.3 Texas Mesilla Agricultural Depletions

The *Texas Mesilla Agricultural Depletions* component of the *Index Delivery* represents the annual calendar year volume of Rio Grande water depleted (consumed) by irrigation use of groundwater and surface water in the *Texas Mesilla*, as shown in the inset of Appendix 2, or in Texas east of the boundary of the Texas Mesilla supplied by groundwater from hydrologically connected aquifers, in units of acre-feet.

The following equation (*Equation 4*) will be used to compute *Texas Mesilla Agricultural Depletions*:

Equation 4

$$\textit{Texas Mesilla Agricultural Depletions [y]} = \textit{Acres [y]} \cdot \textit{CIR[y]}$$

Where,

- *Acres* is the total irrigated area in the *Texas Mesilla* in a given year, including acreage irrigated for crop production as well as non-crop irrigated acreage (e.g., lawns, parks, golf courses, etc.), in units of acres.
- *CIR* is the average consumptive use of irrigation water per acre for the *Texas Mesilla*, equal to 2.8 acre-feet per acre per year (subject to periodic review under the Technical Review terms in Section 8).
- *[y]* indicates the year (e.g., *Acres [1970]* refers to the total irrigated acreage in the *Texas Mesilla* for 1970).

The annual irrigated acreage in the *Texas Mesilla* will be determined based on the sum of the acreage inside and outside of the Texas District boundary.

- Texas will provide the annual irrigated acreage in the *Texas Mesilla* for use in calculating the *Index Delivery*, including documentation of the data and methods used to determine irrigated acreages.

3.4 Texas Mesilla DCMI Depletions

The *Texas Mesilla DCMI Depletions* component of the *Index Delivery* represents depletions to the Rio Grande above the *El Paso Gage* caused by groundwater pumping in the *Texas Mesilla* as shown in the inset of Appendix 2, or in Texas east of the boundary of the Texas Mesilla from hydrologically connected aquifers, for DCMI uses in a calendar year. There are no surface water diversions for DCMI use in the *Texas Mesilla*. If surface water diversions are constructed in the future, then the *Texas Mesilla DCMI Depletions* calculation will be reviewed pursuant to Section 8.

Texas Mesilla DCMI Depletions include:

- Depletions caused by groundwater pumping from the City of El Paso’s Canutillo Well Field (*TX Mesilla DCMI CWF*).
- Depletions caused by groundwater pumping from all other DCMI wells in the *Texas Mesilla*, including municipalities, self-supplied domestics, mutual domestics, schools, commercial businesses, industrial facilities, and any other non-agricultural uses (*TX Mesilla DCMI Other*).

The sum of the following two equations (*Equation 5* and *Equation 6*) will be used to compute total *Texas Mesilla DCMI Depletions*⁶, as presented in *Equation 7*, in units of acre-feet:

Equation 5

$$TX\ Mesilla\ DCMI\ CWF\ [y] = (P_{CWF}[y] \cdot f_d)$$

Where,

- $P_{CWF}[y]$ is the total (gross) volume of water pumped from all wells in the Canutillo Well Field during a given calendar year, in acre-feet.
- f_d is a depletion factor that represents the fraction of total (gross) pumping that depletes the Rio Grande and Project conveyances, equal to 0.95.
- $[y]$ indicates the year (e.g., $P_{CWF}[1970]$ refers to the volume of groundwater pumped in 1970).

⁶ Canutillo return flows associated with El Paso’s wastewater treatment plants are not included in this calculation, as the wastewater discharge returns to the Rio Grande below the *El Paso Gage*.

Equation 6

$$TX\ Mesilla\ DCMI\ Other\ [y] = (P_{Other}\ [y] \cdot f_d) - (P_{Other}\ [y] \cdot f_r)$$

Where,

- $P_{Other}\ [y]$ is the total (gross) volume of water pumped from all DCMI wells in the *Texas Mesilla*, excluding wells in the Canutillo Well Field, in a given calendar year, in acre-feet.
- f_d is a depletion factor that represents the fraction of total (gross) pumping that depletes the Rio Grande and Project conveyances, equal to 0.95.
- f_r is a return flow factor that represents the fraction of total (gross) pumping for by DCMI wells in the *Texas Mesilla*, excluding wells in the Canutillo Well Field, which returns to the Rio Grande above the *El Paso Gage* in the *Texas Mesilla*, equal to 0.33.
- $[y]$ indicates the year (e.g., $P_{Other}\ [1970]$ refers to the volume of groundwater pumping in 1970).

Equation 7

$$Texas\ Mesilla\ DCMI\ Depletions\ [y] = TX\ Mesilla\ DCMI\ CWF\ [y] + TX\ Mesilla\ DCMI\ Other\ [y]$$

Data required to calculate the *Texas Mesilla DCMI Depletions* portion of the *Index Delivery* will be obtained as follows:

- Pumping from the Canutillo Well Field is metered and will be obtained by Texas from El Paso Water (the municipal water utility for the City of El Paso).
- Pumping from other DCMI wells in the *Texas Mesilla* (i.e., DCMI wells outside of Canutillo Well Field) is either not metered or, if metered, records are generally not available. Pumping from these wells is currently estimated at 2,611 acre-feet per calendar year based on an average of 2007-2016 records and estimates. Texas will provide the estimated annual pumping each calendar year and document the methods used to develop the estimate.

3.5 Delivery to Mexico at the Acequia Madre

The *Delivery to Mexico at the Acequia Madre* component of the *Index Delivery* represents the annual calendar year volume of Rio Grande water delivered by the United States to Mexico pursuant to the Convention of 1906. Deliveries to Mexico are included within the flows measured at the *El Paso Gage* and are therefore subtracted from the *Index Delivery* calculation in Equation 3.

The *Delivery to Mexico at the Acequia Madre* will be based on the official daily flow record of deliveries to Mexico as determined by US-IBWC, in units of acre-feet.

3.6 Excess Flow

The **Excess Flow** component of the **Index Delivery** represents a portion of the annual volume of streamflow during the calendar year, in acre-feet, at the **El Paso Gage**, which, like the **Delivery to Mexico at the Acequia Madre**, is subtracted from the **Index Delivery** calculation in *Equation 3*. It represents water that cannot be put to beneficial use in Texas.

Excess Flow is determined based on three criteria:

- **Operational Capacity Criteria** as further described in Section 3.6.1
- **Excess Release Criteria** as further described in Section 3.6.2
- **Extraordinary Circumstances Criteria** as further described in Section 3.6.3

Any Rio Grande water that is put to beneficial use in Texas upstream of Ft. Quitman, Texas, is not considered **Excess Flow**.

Compact spills, whether actual or hypothetical, are determined by the Rio Grande Compact Commission (RGCC) and are not controlled by the determination of **Excess Flow**.

3.6.1 Operational Capacity Criteria

The **Operational Capacity Criteria** for **Excess Flow** quantifies streamflow at the **El Paso Gage**, excluding **Delivery to Mexico at the Acequia Madre**, that cannot be diverted and used in Texas due to the operational capacity of the American Canal and the Texas District distribution system in the El Paso Valley, which is currently approximately 1,000 cubic feet per second (cfs).

The annual volume, in acre-feet, of **Excess Flow** based on this criterion is computed using *Equation 8* and *Equation 9*.

Equation 8

$$\text{Excess Flow [y]} = \text{SUM} [Q_{\text{Excess}} [d] \cdot (60 \cdot 60 \cdot 24 / 43560)]$$

Where,

- **Excess Flow [y]** is the annual volume of excess flow in acre-feet for a given calendar year [y].
- $Q_{\text{Excess}} [d]$ is the **Excess Flow** in cubic feet per second (cfs) on a given day [d], as determined by *Equation 9*.

Equation 9

$$\begin{array}{lll} \text{IF:} & Q_{RGEP}[d] - Q_{MX}[d] = & > 1,000 \text{ cfs} \\ \text{THEN:} & Q_{Excess}[d] = & (Q_{RGEP}[d] - Q_{MX}[d]) - 1,000 \\ \text{OTHERWISE:} & Q_{Excess}[d] = & 0.0 \end{array}$$

Where,

- $Q_{RGEP}[d]$ is the daily average flow rate of streamflow at the *El Paso Gage* in cubic feet per second on a given day $[d]$.
- $Q_{MX}[d]$ is the daily average flow rate of *Delivery to Mexico at the Acequia Madre* in cubic feet per second on a given day $[d]$.

3.6.2 Excess Release Criteria

The *Excess Release Criteria* for *Excess Flow* quantifies streamflow at the *El Paso Gage*, excluding *Delivery to Mexico at the Acequia Madre*, resulting from an excess release from Caballo Dam, and which is not put to beneficial use in Texas. These criteria may apply to flows less than the *Operational Capacity Criteria* of 1,000 cfs. Excess releases from Caballo Dam consist of water released for flood control purposes, as necessary to accommodate operations and maintenance activities, or for purposes other than to meet water orders by the irrigation district in New Mexico, the irrigation district in Texas, and Mexico.

In the event of an excess release from Caballo Dam, available data and information will be used to determine the timing, duration, and volume of *Excess Flow* resulting from any excess release⁷. Available data and information may include but are not limited to: discussion with staff from Reclamation, the New Mexico District, the Texas District, and US-IBWC; incident reports; emergency declarations; Project water orders; and metered or estimated flows in the US-IBWC, the Texas District, or Hudspeth County Conservation & Reclamation District distribution systems. Available data and information may differ between occurrences of excess releases.

The *Excess Release Criteria* for *Excess Flow* will be determined by the RGCC upon recommendation of the Engineer Advisers of Colorado, New Mexico and Texas.

⁷ In the case that these criteria result in an adjustment to the *Index Delivery* in any given calendar year, the *Caballo Release* from that year must be adjusted accordingly.

3.6.3 Extraordinary Circumstances Criteria

The *Extraordinary Circumstances Criteria* for *Excess Flow* will be determined by the RGCC upon recommendation of the Engineer Advisers of Colorado, New Mexico and Texas. Extraordinary circumstances may occur, for example, if Rio Grande water quality above the American Dam were hazardous. Available data, information, and methods will be used to determine the occurrence of extraordinary circumstances and to quantify the timing, duration, and quantity of *Excess Flow* resulting from such circumstances. Available data and information may differ between occurrences of extraordinary circumstances.

Section 4: Annual Index Departure

4.1 Definition and Calculation of the Annual Index Departure

The *Annual Index Departure* is calculated annually, on a calendar year basis, by subtracting the *Index Obligation* from the *Index Delivery*. The calculation may result in an:

- *Annual Negative Departure* (under-delivery), when $Index\ Delivery < Index\ Obligation$
- *Annual Positive Departure* (over-delivery), when $Index\ Delivery > Index\ Obligation$

The *Annual Index Departure* is subject to the provisions described in Sections 4.2 through 4.4.

4.2 Cap on Annual Positive Departures

An *Annual Positive Departure* in excess of 67,500 acre-feet shall be treated as the equivalent of 67,500 acre-feet for the purposes of calculating the *Accrued Index Departure*⁸.

4.3 Cap on Annual Negative Departures

An *Annual Negative Departure* in excess of 112,500 acre-feet during the first full five calendar years following entry of the Consent Decree shall be treated as the equivalent of 112,500 acre-feet for the purposes of calculating the *Accrued Index Departure*.

⁸ Defined in Section 5

An *Annual Negative Departure* in excess of 90,000 acre-feet beginning the sixth full calendar year after entry of the Consent Decree shall be treated as the equivalent of 90,000 acre-feet for the purposes of calculating *Accrued Index Departure*.

4.4 Suspension of Annual Index Departures

In any year in which the *Caballo Release* is less than 200,000 acre-feet, the *Annual Index Departure* will be set to zero acre-feet for the purposes of calculating the *Accrued Index Departure*.

In any year in which the Rio Grande Compact Commission determines that there is an actual or hypothetical spill under the Compact the *Annual Index Departure* will be set to zero acre-feet and all *Accrued Index Departures* will be extinguished as described below in Section 5.2.

Section 5: Accrued Index Departure

5.1 Definition and Calculation of the Accrued Index Departure

The *Accrued Index Departure* is calculated annually, on a calendar year basis, as a running sum the *Annual Index Departures*. The calculation may result in an:

- *Accrued Negative Departure* (representing an accrued net under-delivery by New Mexico through time).
- *Accrued Positive Index Departure* (representing an accrued net over-delivery by New Mexico through time).

An *Annual Negative Departure* will be:

- Used to reduce an *Accrued Positive Departure* at the beginning of the calendar year by the amount of the *Annual Negative Departure*; or
- Added to the *Accrued Negative Departure* at the beginning of the calendar year by the amount of the *Annual Negative Departure*.

An *Annual Positive Departure* will be:

- Used to reduce an *Accrued Negative Departure* at the beginning of the calendar year by the amount of the *Annual Positive Departure*; or

- Added to the *Accrued Positive Departure* at the beginning of the calendar year by the amount of the *Annual Positive Departure*.

The calculation of the *Accrued Index Departure* is subject to the provisions described in Sections 4 and 5.

5.2 Extinguishment of Accrued Index Departures

In any year in which the RGCC determines that there is an actual or hypothetical spill under the Compact, the *Accrued Index Departure* at the beginning of that year, whether positive (accrued over-delivery) or negative (accrued under-delivery), will be extinguished. Additionally, as described in Section 4.4, the *Annual Index Departure* will also be set to zero for that year. Therefore, the *Accrued Index Departure* at the end of the year in which the spill occurs will be equal to zero acre-feet.

5.3 Cancellation of Accrued Negative Departures for Texas District Carryover

The Texas District's *Project Carryover Water* for a given year is the part of the Texas District's total allocation that remains unused at the end of the calendar year.

In any calendar year in which the average of the Texas District's *Project Carryover Water* for the current year and the two prior years (three-year lagged moving average), is greater than 180,000 acre-feet, and the *Accrued Index Departure* at the end of the current year is negative, the *Accrued Negative Departure* at the end of the current year will be extinguished. Therefore, the *Accrued Index Departure* for the following year will be equal to zero plus the *Annual Index Departure* that will be calculated during that following year.

In determining the three-year rolling average of the Texas District's *Project Carryover Water*, the current year's *Allocation Transfer* amount (see Section 5.6) will be subtracted in the calculation of the three-year rolling average *Project Carryover Water* balance if the average of the Texas District's *Project Carryover Water* for the two prior years exceeds 180,000 acre-feet. This provision is intended to prevent the current year's *Allocation Transfer* from causing an exceedance of the 180,000 acre-feet threshold.

5.4 Accrued Negative Departure Limits

5.4.1 Accrued Negative Departure Limits

During the first full five calendar years following entry of the Consent Decree, New Mexico may have *Accrued Negative Departures* up to, but not in excess of 150,000 acre-feet.

Beginning the sixth full calendar year following entry of the Consent Decree, New Mexico may have *Accrued Negative Departures* up to, but not in excess of 120,000 acre-feet.

These limitations are known as the *Accrued Negative Departure Limits*.

5.4.2 Index Adjustments for Exceedances of the Accrued Negative Departure Limit

If New Mexico exceeds the *Accrued Negative Departure Limit* of 150,000/120,000 acre-feet in three consecutive years, New Mexico will provide 12,000 acre-feet of water in excess of its *Index Obligation* for each year that it exceeds the *Accrued Negative Departure Limit*. New Mexico will have three years to provide the full 36,000 acre-feet, excluding years in which the *Caballo Release* is less than 200,000 acre-feet.

If New Mexico exceeds the *Accrued Negative Departure Limit* of 150,000/120,000 acre-feet in four or more consecutive years, New Mexico will provide 15,000 acre-feet of water in excess of its *Index Obligation* for each additional year over the four years that it exceeds the *Accrued Negative Departure Limit*. The 15,000 acre-feet in excess of New Mexico's *Index Obligation* will be provided during the year immediately following the violation of the *Accrued Negative Departure Limit*, excluding years in which the *Caballo Release* is less than 200,000 acre-feet.

The additional amounts required under these exceedance provisions are known as *Index Adjustments*. *Index Adjustments* shall be accounted for separately from *Accrued Negative Departures*. Provided New Mexico meets its *Index Obligation*, New Mexico shall classify *Annual Positive Departures* as either *Index Adjustments* or reduction in *Accrued Negative Departures*.

5.4.3 Impact of the Texas District's Project Carryover Water on Index Departure Limits

If the *Accrued Negative Departure* exceeds the *Accrued Negative Departure Limit* of 150,000/120,000 acre-feet, the impact, if any, of the Texas District's *Project Carryover Water* on the *Accrued Negative Departure* will be considered.

Consideration of that impact will include the evaluation of the difference between the *Index Obligation* and the *Index Delivery* that would have occurred if the current balance in the Texas District's *Project Carryover Water* account had been released the previous year.

When determining whether New Mexico is in violation of the *Accrued Negative Departure Limit*, or whether the additional *Index Adjustments* for exceedances of the *Accrued Negative Departure Limit* (see Section 5.4.2) apply, the impact of the Texas District's *Project Carryover Water* will be added to the current *Accrued Negative Departure*, thus reducing the apparent *Accrued Negative Departure* for that year. This apparent *Accrued Negative Departure* will then be used to determine only whether New Mexico is in violation of the *Accrued Negative Departure Limit* for that year and whether *Index Adjustments* should apply. The current value of the *Accrued Negative Departure* will remain unchanged.

5.5 End of 5th Year Adjustment to Accrued Index Departures

If there is an *Accrued Index Departure* at the end of the fifth year following the entry of the Consent Decree, or if a Negative *Trigger* is reached pursuant to Paragraph II.D.2 of the Consent Decree in the first five years, the *Accrued Index Departure* (positive or negative), will be reduced by the amount of the *Accrued Index Departure* up to, but not to exceed, 20,000 acre-feet or until the accounting for the *Accrued Index Departure* reflects zero acre-feet.

5.6 Allocation Transfers

5.6.1 Definition of Allocation Transfers

Allocation Transfers are used to move current-year allocation from one District (either Texas or New Mexico) to the current-year allocation of another District (either Texas or New Mexico). *Allocation Transfers* from one District to the other will immediately reduce New Mexico's *Accrued Negative Departure* or Texas's *Accrued Positive Departure* by the same amount as the *Allocation Transfer*.

More specifically:

- If an *Allocation Transfer* occurs from the current-year allocation for the New Mexico District to the current-year allocation for the Texas District, then, simultaneously with the transfer, the *Accrued Negative Departure* will be reduced by an amount equal to the transfer.
- If an *Allocation Transfer* occurs from the current-year allocation for the Texas District to the current-year allocation for the New Mexico District,

then, simultaneously with the transfer, the *Accrued Positive Departure* will be reduced by an amount equal to the transfer.

5.6.2 Accrued Positive Departure Trigger

If there is an *Accrued Positive Departure* that exceeds 50,000 acre-feet for one year (also known as the *Accrued Positive Departure Trigger*), the Texas District will provide *Allocation Transfers* to the New Mexico District, equal in total to the amount of the *Accrued Positive Departure* that is greater than 16,000 acre-feet, and will do so over the subsequent three calendar years.

5.6.3 Accrued Negative Departure Trigger

If there is an *Accrued Negative Departure* that exceeds 80,000 acre-feet at the end of any calendar year (also known as the *Accrued Negative Departure Trigger*), New Mexico will take water management actions to reduce the *Accrued Negative Departures* to less than 16,000 acre-feet within six calendar years following the exceedance of the *Accrued Negative Departure Trigger*. These management actions are solely within New Mexico's discretion and may include *Allocation Transfers*.

Section 6: Data for EEPI Calculations

The data required for the annual EEPI calculations shall be reported to the Engineer Advisers for the Compacting States following the Compact accounting schedules in the "Schedule for Review and Approval of Rio Grande Compact Accounting Records for the Previous Year". More specifically, the following data will be required annually, on a calendar year, for EEPI calculations:

- Daily official stream flow data from the Rio Grande at El Paso, Texas, (USGS 08364000).
 - Data source: US-IBWC
- Daily official flow data from the Rio Grande Below Caballo Dam, New Mexico stream gage, (USGS 08365000).
 - Data source: Reclamation.
- Official daily flow records of Delivery to Mexico at the Acequia Madre.
 - Data source: US-IBWC.
- Pumping records for the Canutillo Well Field, Texas.
 - Data source: Texas.
- Pumping estimates for any other DCMI use in Texas Mesilla
 - Data source: Texas

- Irrigated acreage estimates within the Texas Mesilla.
 - Data source: Texas.
- Temperature data from the Leyendecker II PSRC weather station.
 - Data source: New Mexico.
- Annual ***Project Carryover Water*** for New Mexico District and Texas District
 - Data source: Reclamation.

Section 7: Consent Decree Accounting Provisions

The following list includes the accounting-related provisions in the Consent Decree:

- ***Index Obligation***, pg. 6, Paragraph II(B)(ii)(e)
- ***Index Delivery***, pg. 7, Paragraph II(B)(ii)(f)
- Streamflow gages, pg. 7, Paragraph II(B)(ii)(g)
- ***Annual Negative Departure***, pg. 7, Paragraph II(B)(iii)(a)
- ***Annual Positive Departure***, pg. 8, Paragraph II(B)(iii)(b)
- ***Accrued Index Departures***, pg. 7, Paragraph II(B)(iii)(a) and pg. 8, Paragraph II(B)(iii)(b)
- ***Allocation Transfers***, pg. 8, Paragraph II(B)(iii)(c)
- Cap on ***Annual Positive Departures***, pg. 9, Paragraph II(C)(2)
- Cap on ***Annual Negative Departures*** (first 5 years), pg. 9, Paragraph II(C)(3)(a)(ii)
- Cap on ***Annual Negative Departures*** (starting year 6), pg. 10, Paragraph II(C)(3)(a)(iv)
- Exceedances of ***Accrued Negative Departure Limits*** (3 consecutive years), pg. 10, Paragraph II(C)(3)(b)(i)
- Exceedances of ***Accrued Negative Departure Limits*** (4 or more consecutive years), pg. 10, Paragraph II(C)(3)(b)(ii)
- ***Index Adjustments***, pg. 10, Paragraph II(C)(3)(b)(i) and Paragraph II(C)(3)(b)(ii)
- ***Project Carryover Water***, pg. 11, Paragraph II(C)(3)(c)
- ***Caballo Release*** less than 200,000 acre-feet, pg. 12, Paragraph II(E)(1)(a)
- ***Caballo Release*** greater than 790,000 acre-feet, pg. 12, Paragraph II(E)(1)(b)
- End of 5th Year Adjustment to ***Accrued Index Departure***, pg. 12, Paragraph II(E)(2)
- ***Aridity Adjustment***, pg. 12, Paragraph II(E)(3)
- Actual or hypothetical spill under the Compact, pg. 12, Paragraph II(E)(4)
- Index Accounting, pg. 13, Paragraph II(F)(2)

Section 8: Review and Revision

The following procedure will be used to review and revise, if needed, the data sources and methods used to determine inputs to the calculation of the *EEPI*:

- ***Request for Review***

If any Compacting State identifies a significant error, bias, discrepancy, or other issue with the data sources and/or method used to determine any input to the *EEPI*, that Compact State may request that the RGCC initiate a review of the data sources and/or method in question. In making a request for review, the Compacting State making the request must provide documentation and technical evidence substantiating the suspected error, bias, discrepancy, or other issues.

- ***Evaluation of Request for Review***

The RGCC will evaluate the request for review and supporting documentation and evidence.

- ***Initiation of Review***

If the RGCC determines that a review is warranted, the RGCC will convene a Technical Committee to conduct the review. The RGCC will instruct the Technical Committee as to the scope of the review.

- ***Technical Review***

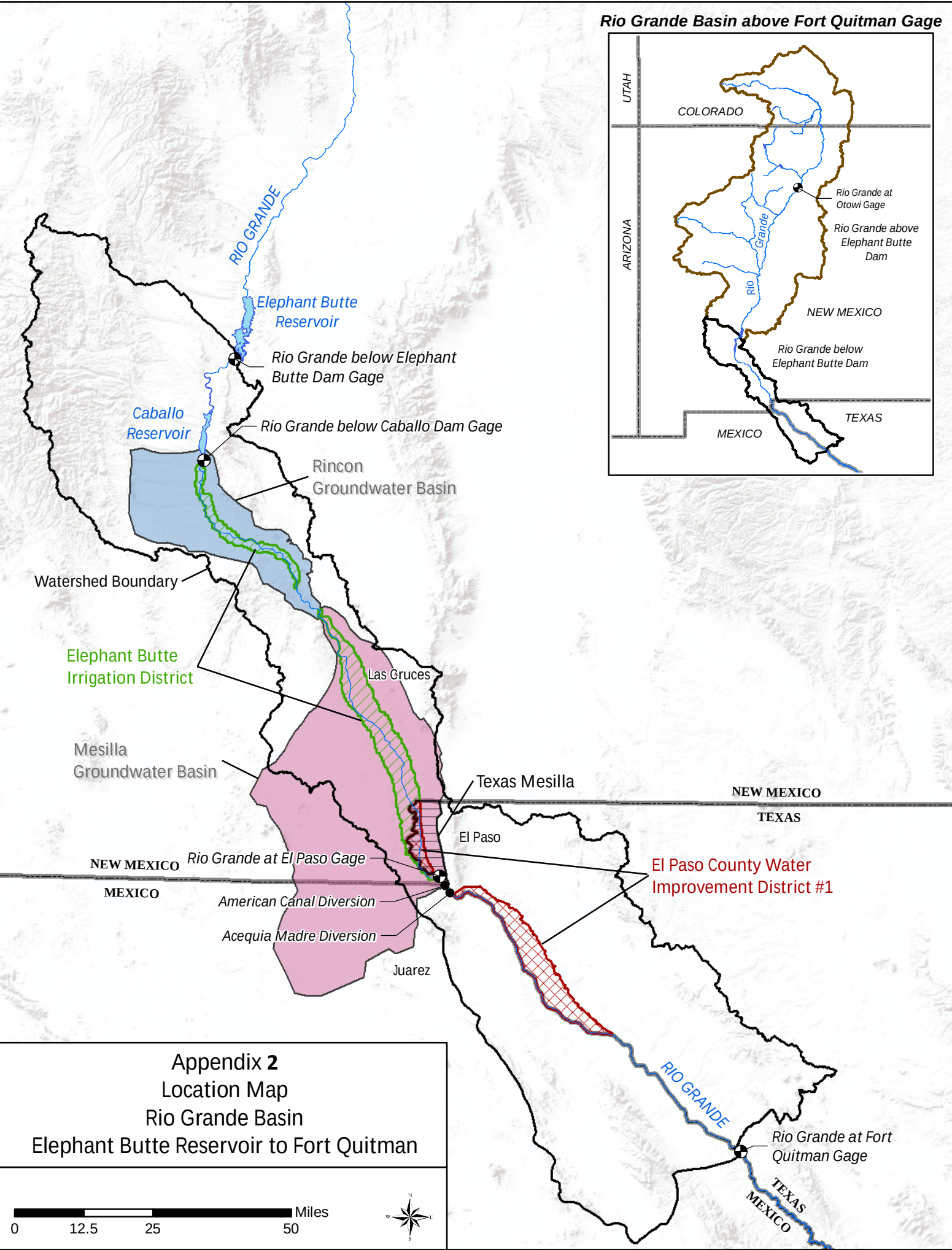
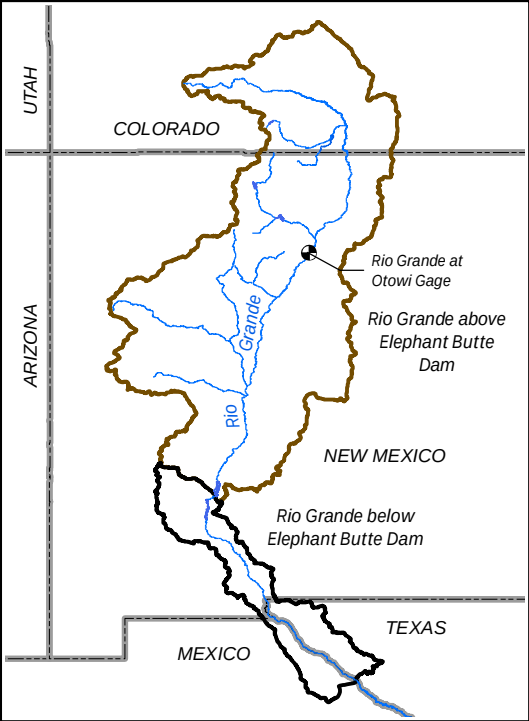
The Technical Committee will carry out the review as directed by the RGCC and will report their findings to the RGCC. If the Technical Committee recommends that the data sources and/or methods in question should be revised, the Technical Committee will recommend appropriate revisions. If warranted, the Technical Committee may recommend that previously approved *Annual* and *Accrued Index Departures* be corrected retroactively; if correction is recommended, the Technical Committee will identify a specified period over which the correction is recommended. If the Technical Committee fails to achieve consensus regarding recommended revisions or corrections, the opinion of committee members from each Party will be reported to the RGCC.

- ***Implementation of Revisions***

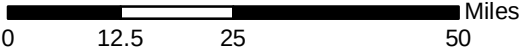
The RGCC will determine whether to accept and implement any revisions or corrections recommended by the Technical Committee.

APPENDIX 2

Rio Grande Basin above Fort Quitman Gage



Appendix 2
Location Map
Rio Grande Basin
Elephant Butte Reservoir to Fort Quitman



Appendix 2. Inset of the Texas Portion of Mesilla Groundwater Basin (Texas Mesilla)

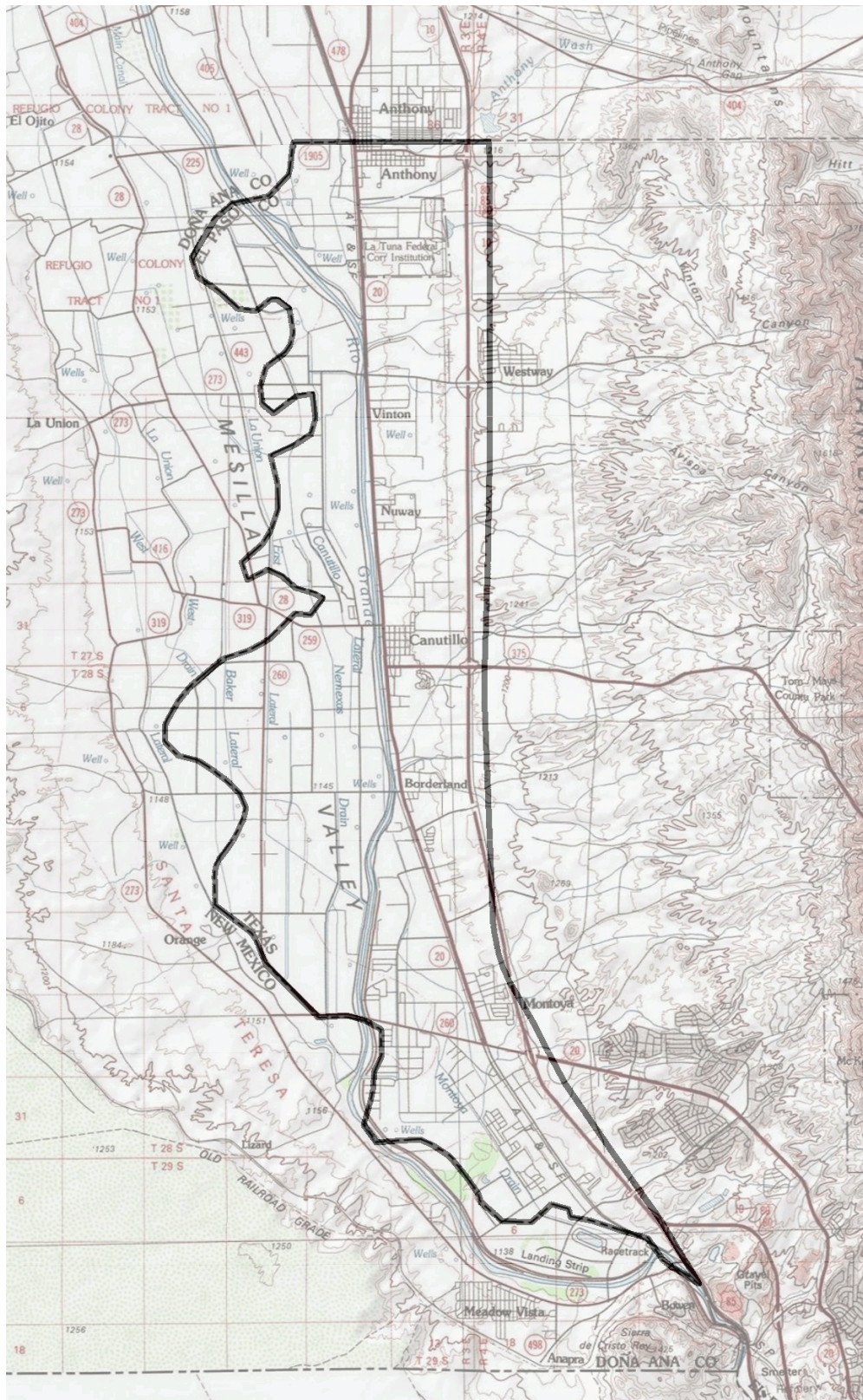


EXHIBIT 2

DECLARATION OF TEXAS RIO GRANDE
COMPACT COMMISSIONER ROBERT
SCOTT SKOV IN SUPPORT OF THE JOINT
MOTION OF THE STATE OF TEXAS, STATE
OF NEW MEXICO, AND STATE OF
COLORADO TO ENTER COMPACT DECREE
SUPPORTING THE RIO GRANDE COMPACT
(WITH EXHIBIT A)

No. 141, Original

In the

SUPREME COURT OF THE UNITED STATES

STATE OF TEXAS,

Plaintiff,

v.

STATE OF NEW MEXICO and
STATE OF COLORADO,

Defendants.

OFFICE OF THE SPECIAL MASTER

**DECLARATION OF TEXAS RIO GRANDE COMPACT
COMMISSIONER ROBERT SCOTT SKOV
IN SUPPORT OF THE JOINT MOTION OF THE STATE OF
TEXAS, STATE OF NEW MEXICO, AND STATE OF COLORADO
TO ENTER COMPACT DECREE SUPPORTING THE RIO
GRANDE COMPACT**

STUART L. SOMACH, ESQ.*
THERESA C. BARFIELD, ESQ.
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ssomach@somachlaw.com
**Counsel of Record*

August 29, 2025

I, Robert Scott Skov, declare as follows:

1. My name is Robert Scott Skov; I prefer to be called Bobby.

My place of business is 15511 Alameda Avenue, Fabens, Texas 79838 and I receive U.S. mail correspondence at Post Office Box 1378, Fabens, Texas 79838.

2. The following matters are within my personal knowledge and, if called as a witness, I can competently testify thereto.

3. My occupation is a farmer.

4. The State of Texas (Texas) is a signatory to the 1938 Rio Grande Compact (Compact), along with the States of Colorado (Colorado) and New Mexico (New Mexico).

5. Article XII of the Compact establishes the Rio Grande Compact Commission (Commission). The voting members of the Commission include one representative from each state: Colorado, New Mexico, and Texas.

6. The Governor of Texas, with the advice and consent of the Texas Senate, appoints a commissioner to represent Texas on the Commission. Tex. Water Code § 41.003.

7. On April 14, 2021, I was appointed by the Governor of Texas as the Texas Rio Grande Compact Commissioner (Commissioner). I was

confirmed in that position by the Texas Senate on June 9, 2021. I assumed the office of Commissioner on that date.

8. As the Commissioner, I am the representative of Texas that has been charged with serving as the client representative to provide client related input to the Texas Attorney General and to Texas's outside legal counsel in this action. In that role, I have reviewed the Texas Complaint and most of the relevant pleadings in this case.

9. I have also met with and fully discussed the instant litigation with Mr. Pat Gordon, my predecessor as Commissioner. Mr. Gordon served as the Commissioner from 2006 until my appointment as Commissioner. Mr. Gordon was the Commissioner in 2013 when Texas petitioned the United States Supreme Court for permission to file its Complaint in this action.

10. In my capacity as the Commissioner, I have attended all status conferences and hearings in this matter since June 9, 2021. During this period, I have been involved in every policy decision that has been made in this litigation on behalf of Texas. I have also attended every mediation session in which Texas was in attendance. I have also had informal discussions about the litigation and possible settlement with each of the principals representing each of the parties to this litigation.

11. I am fully informed of and fully understand the provisions of the proposed consent decree supporting the Compact (Compact Decree). Among other things, New Mexico is obligated under the Compact Decree to annually deliver *additional* amounts of water to Texas to make up for past under deliveries when accrued Index departures exceed 150,000 acre-feet (for the first 5 years, and 120,000 acre-feet thereafter). While this is not money damages, Texas prefers New Mexico to guarantee delivery of water and in “real time” when it likely will be needed most.

12. In my capacity as the Commissioner, I have discussed and informed the chairwoman of the Texas Commission on Environmental Quality (TCEQ) and the chairwoman and representatives of the Texas Water Development Board (TWDB) about the progress of the litigation, the mediation, and the terms of the Compacting States’ Decree. TCEQ and TWDB are the Texas state agencies that have direct involvement in the instant litigation. I have also discussed the mediation and the terms of the Compact Decree with the Governor’s Office as well as with the Governor himself.

13. On August 22, 2025, I attended a special meeting of the Commission to consider the Compact Decree.

14. In considering the Compact Decree, the Commission concluded, *inter alia*, that the Compact Decree and its appendix:

- a. were consistent with the Compact, and fair to all the Compacting States; and
- b. provides for the collection, correlation, and presentation of factual data necessary for the administration of the Compact's apportionment of water between New Mexico and Texas below Elephant Butte Reservoir.

15. To memorialize our consideration of the Compact Decree at our meeting on August 22, 2025, the Commission considered whether to approve Resolution A, attached to this Declaration as Exhibit A.

16. Resolution A finds that the Compact Decree is consistent with the Compact and resolves the interstate compact issues.

17. Resolution A was approved by the Commission at the August 22, 2025 meeting.

18. The Commission's authority to take action to approve resolutions such as Resolution A was specifically bestowed on the Commission by the Compact, Article XII.

19. In my capacity as the Commissioner, I have also advised and recommended to the Governor that the Attorney General and outside legal

counsel file on behalf of Texas the “Joint Motion of the State of Texas, State of New Mexico, and State of Colorado to Enter Compact Decree Supporting the Rio Grande Compact,” and formally advocate for its adoption by the United States Supreme Court.

20. Consistent with all of the above and acting in my capacity as the Commissioner, I urge the Special Master in this litigation to recommend to the Court that it enter the Compact Decree.

21. I further respectfully request that the Court enter the Compact Decree, as a full and complete resolution of the issues raised by Texas in its Complaint.

22. In my capacity as the Commissioner, it is my view that the Compact Decree is consistent with the Compact.

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Executed this 26th day of August 2025, at Fabens, Texas.



Robert Scott Skov

EXHIBIT A

**RESOLUTION OF THE RIO GRANDE COMPACT COMMISSION
REGARDING the PROPOSED COMPACT DECREE in
ORIGINAL ACTION NO. 141,
TEXAS v. NEW MEXICO AND COLORADO, in the
UNITED STATES SUPREME COURT**

August 22, 2025

WHEREAS, the States of Colorado, New Mexico, and Texas (Compacting States) entered into the Rio Grande Compact (Compact), signed in 1938, apportioning the waters of the Rio Grande above Fort Quitman, Texas; and

WHEREAS, the Rio Grande Compact was passed as Public Act No. 96 by the 76th Congress of the United States and approved by the President on May 31, 1939; and

WHEREAS, Texas filed Original Action No. 141, and the Supreme Court exercised original jurisdiction over this controversy involving the States of Colorado, New Mexico, and Texas; and

WHEREAS, the Original Complaint alleges New Mexico violated and continues to violate the Compact, and the New Mexico counterclaims allege Texas violated and continues to violate the Compact, and the Supreme Court allowed a complaint in intervention from the United States; and

WHEREAS, Colorado, an originally named defendant, has a general interest in litigation of the Original Complaint, insofar as Colorado is a signatory to the Compact, and Colorado's own Compact interests based upon water releases and storage duties and rights may be affected by reservoir levels and releases in New Mexico and Texas; and

WHEREAS, the Compacting States have reached a settlement of the Compact issues that have been raised in Original Action 141; and, in furtherance of said settlement, the Compacting States have agreed to file a motion requesting that the Special Master recommend that a Compact Decree and its appendices be entered by the Court resolving the Compacting States' dispute; and, the Compact Decree resolves the interstate Compact issues; and

WHEREAS, the Compact Decree does not address intrastate issues within New Mexico associated with the Rio Grande Project;

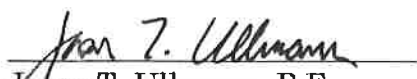
NOW, THEREFORE, IT IS HEREBY RESOLVED, that the Rio Grande Compact Commission hereby determines the Compact Decree and its appendices to be consistent with the Compact and fair to all the Compacting states; and

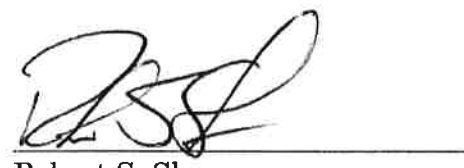
BE IT FURTHER RESOLVED, that the Compact Decree provides for the collection, correlation, and presentation of factual data necessary for the administration of the Compact's apportionment of water among New Mexico and Texas below Elephant Butte Reservoir; and

BE IT FURTHER RESOLVED, that the Rio Grande Compact Commission hereby endorses the Compact Decree and its appendices and finds that the Compact Decree and its appendices fully resolve the outstanding Compact claims and counterclaims in the Original Action No. 141; and

BE IT FURTHER RESOLVED, that the Rio Grande Compact Commission does recommend to the Attorneys General of the Compacting States that they approve the Compact Decree for administration of the Compact as a resolution of the current dispute among the States regarding the apportionment of water below Elephant Butte Reservoir; and

BE IT FINALLY RESOLVED, that nothing herein represents a waiver or admission of any legal or factual matter by any Commissioner, Engineer Adviser, Legal Adviser, or the States of Colorado, New Mexico, and Texas.


Jason T. Ullmann, P.E.
Commissioner for Colorado


Robert S. Skov
Commissioner for Texas


Elizabeth K. Anderson, P.E.
Commissioner for New Mexico

EXHIBIT 3

DECLARATION OF TEXAS RIO GRANDE
COMPACT COMMISSIONER ENGINEER
ADVISER SUE ELLYN “SUZY” SUMMERS
VALENTINE, P.E., C.F.M., IN SUPPORT
OF THE JOINT MOTION OF THE STATE OF
TEXAS, STATE OF NEW MEXICO, AND
STATE OF COLORADO TO ENTER
COMPACT DECREE SUPPORTING THE
RIO GRANDE COMPACT

No. 141, Original

In the

SUPREME COURT OF THE UNITED STATES

STATE OF TEXAS,

Plaintiff,

v.

STATE OF NEW MEXICO and
STATE OF COLORADO,

Defendants.

OFFICE OF THE SPECIAL MASTER

**DECLARATION OF TEXAS RIO GRANDE COMPACT
COMMISSIONER ENGINEER ADVISER SUE ELLYN “SUZY”
SUMMERS VALENTINE, P.E., C.F.M., IN SUPPORT OF THE JOINT
MOTION OF THE STATE OF TEXAS, STATE OF NEW MEXICO, AND
STATE OF COLORADO TO ENTER COMPACT DECREE SUPPORTING
THE RIO GRANDE COMPACT**

STUART L. SOMACH, ESQ.*
THERESA C. BARFIELD, ESQ.
SARAH A. KLAHN, ESQ.
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Sacramento, CA 95814
Telephone: 916-446-7979
ssomach@somachlaw.com
**Counsel of Record*

August 29, 2025

I, Sue Ellyn “Suzy” Summers Valentine, upon personal knowledge, declare and state as follows:

1. I am the Engineer Adviser (EA) to the Texas Rio Grande Compact Commissioner. I have been in this position since 2019. Prior to my work as the EA to the Rio Grande Compact, I served as EA for the other four Texas river compacts including the Pecos, Canadian, Red, and Sabine river basins since 2012. Before beginning my tenure as the Texas river compacts EA in 2012, I worked as a senior engineer in the Water Availability Division at the Texas Commission on Environmental Quality since 2010. Prior to this, I was a water resources engineer, program manager and division manager for over 20 years with the environmental consulting firm, PBS&J (previously Espey, Huston & Associates, Inc.), and I also managed the Water Resources and Floodplain Management Section for the Lower Colorado River Authority for about five years.

2. I earned a Bachelor of Fine Arts degree in Graphic Design from Southern Methodist University in 1971.

3. In 1984, I earned a Bachelor of Engineering Science degree in Water Resources with Honors from the University of Texas at Austin.

4. I have been licensed as a Professional Engineer in the State of Texas since 1991.

5. As the Texas EA for the Rio Grande Compact Commission (Commission), my roles and responsibilities include:
- a. Technical assistance and support to the Commissioner for:
 - i. Monitoring water deliveries, reservoir levels, and water rights for Compact compliance;
 - ii. Conducting complex accounting for the required water deliveries from/to other states; and
 - iii. Providing advice and support on technical and engineering activities and projects sponsored by the Commission.
 - b. Administrative assistance and support for the Commissioner, including:
 - i. Preparing reports and information for the Commissioner in preparation for meetings;
 - ii. Preparing and tracking the annual Commission budgets;
 - iii. Responding to legislative and public information requests;

- iv. Attending Commission annual and special meetings for and/or with the Commissioner;
- v. Preparing memoranda concerning meeting actions and information;
- vi. Preparing draft letters as needed for the Commissioner;
- vii. Communications with other member states, state and federal agencies, and stakeholders;
- viii. Preparing and distributing Commission reports, information, and resolutions;
- ix. Maintaining Commission documentation, data, and permanent files; and
- x. Organizing and preparing materials for meetings when hosted by Texas.

6. My involvement with *Texas v. New Mexico*, Original No. 141, began in 2013 with assistance to the previous Texas EA for the Commission. I became more involved in January of 2019 when I accepted the position of EA for the Commission, and I have assisted in settlement negotiations on behalf of the State of Texas beginning in June of 2019.

7. I am familiar with the operation of the Rio Grande Project insofar as the Project operations and accounting are important to my role as EA.

8. I am familiar with the Compacting States' consent decree (Compact Decree), particularly as it relates to the roles that the Compacting States' EAs will play in reporting compliance with the Compact Decree to the Commission.

9. The EAs currently receive Rio Grande Project accounting information from the United States Bureau of Reclamation (Reclamation) at the EA meetings each March of the year.

10. Prior to these meetings with my fellow EAs, I monitor the status of the annual Compact Accounting using the RiverWare Viewer for the Upper Rio Grande Water Operations Model (URGWOM) daily simulations from Reclamation.

11. The EAs then meet in person (virtually when necessary) on several occasions prior to the Compact Commission meeting, which is usually scheduled for April.

12. One of the main purposes of our EA meetings is to develop a report for the Commission which includes the watershed conditions, concerns raised by the Commission and individual commissioners, Compact Accounting, and activities that were reported by the federal agencies working in the Rio Grande Basin for the previous year. When possible, we develop a report that unanimously reflects our views on the watershed conditions and the Commission's concerns; however, when we have a disagreement, that is reflected in the report.

13. If the Compact Decree is entered by the Supreme Court, the roles and responsibilities of the EAs will not change dramatically, but they will include additional accounting analyses and reporting.

- a. When Reclamation presents their previous calendar-year report and Project accounting, we would also request that they provide the Reclamation-sourced data required for calculating the initial Effective El Paso Index (EEPI) accounting for the prior year generally following the “Schedule for Review and Approval of Rio Grande Compact Accounting Records for the Previous Year,” which is a directive to the agencies that participate in Compact Accounting specifying the types of data they must provide to the Commission and the deadlines therefore, approved by the Compact Commission in March of 2016.
- b. The data required for calculating the EEPI is described in the Compact Decree in Appendix 1, paragraph 6.
- c. That additional EEPI accounting information will be used to evaluate if New Mexico is achieving the Index targets to deliver Texas’s apportionment, and whether the EEPI accounting reflects negative or positive departures.

- d. The resulting Index Accounting tables will be included in the annual EA Report to the Commission along with the current Compact Accounting tables.

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Executed this 27th day of August 2025, at Austin, Texas.


Sue Ellyn "Suzy" Summers Valentine

EXHIBIT 4

DECLARATION OF WILLIAM R.
HUTCHISON, PH.D., P.E., P.G., IN
SUPPORT OF THE JOINT MOTION OF THE
STATE OF TEXAS, STATE OF NEW
MEXICO, AND STATE OF COLORADO TO
ENTER COMPACT DECREE SUPPORTING
THE RIO GRANDE COMPACT
(WITH ATTACHMENTS A AND B)

No. 141, Original

In the

SUPREME COURT OF THE UNITED STATES

STATE OF TEXAS,

Plaintiff,

v.

STATE OF NEW MEXICO and
STATE OF COLORADO,

Defendants.

OFFICE OF THE SPECIAL MASTER

**DECLARATION OF WILLIAM R. HUTCHISON, PH.D., P.E., P.G.,
IN SUPPORT OF THE JOINT MOTION OF THE STATE OF
TEXAS, STATE OF NEW MEXICO, AND STATE OF COLORADO
TO ENTER COMPACT DECREE SUPPORTING
THE RIO GRANDE COMPACT**

STUART L. SOMACH, ESQ.*
THERESA C. BARFIELD, ESQ.
SARAH A. KLAHN, ESQ.
SOMACH SIMMONS & DUNN, PC
500 Capitol Mall, Suite 1000
Sacramento, CA 95814
Telephone: 916-446-7979
ssomach@somachlaw.com
**Counsel of Record*

August 29, 2025

I, William R. Hutchison, declare as follows:

1.0 Background and Experience

1. My name is William R. Hutchison, Ph.D., P.E., P.G., I was born on November 4, 1958, in Nueces County, Texas. The following matters are within my personal knowledge and, if called as a witness, I can competently testify thereto.

2. I am an independent consultant with professional experience as a groundwater hydrologist since 1983. I have been retained by the State of Texas (Texas) to provide consulting services on hydrologic issues presented in this action. My professional resume is included in Attachment A.

3. My street address is 909 Davy Street, Brenham, Texas 77833.

4. My education includes a Bachelor of Science degree in Soil and Water Science from the University of California, Davis, a Master of Science degree in Hydrology from the University of Arizona, and a Ph.D. in Environmental Science and Engineering from the University of Texas at El Paso.

5. I am licensed in the State of Texas as follows: Professional Engineer (Geological and Civil) No. 96287, Engineering Firm No. 14526, and Professional Geoscientist (Geology) No. 286.

6. From August 1983 to October 2001, I was employed by various consulting firms or worked as an independent consultant in California and Arizona.
7. From October 2001 to June 2009, I was employed by El Paso Water Utilities in El Paso, Texas.
8. From June 2009 to August 2011, I was the Director of the Groundwater Resources Division of the Texas Water Development Board in Austin, Texas.
9. From August 2011 to July 2012, I was employed by LBG-Guyton Associates in Austin, Texas.
10. Since July 2012, I have been an independent consultant based in Austin, Texas (July 2012 to July 2015), Aberdeen, North Carolina (July 2015 to January 2016), Jamaica Beach, Texas (January 2016 to June 2023), and Brenham, Texas (June 2023 to present).
11. I have completed (or I am actively working on) over 100 consulting assignments for over 50 different clients in Texas.
12. In the last four years, I have not testified as an expert witness.
13. My direct experience in the El Paso, Texas area began in 2001 as an employee of El Paso Water Utilities.

14. In 2006, I completed my doctoral dissertation, titled Groundwater Management in El Paso, Texas, which included details of modeling and management of the Mesilla Basin in New Mexico and Texas.

2.0 Overview of the Effective El Paso Index

15. This Declaration presents an overview of the development of the Effective El Paso Index (“EEPI” or “Index”) which is the foundation of the decree supporting the Rio Grande Compact (Compact Decree) negotiated by the Compacting States. (Section II.B of the Compact Decree describes the EEPI).

16. On behalf of Texas, I participated as a primary member of the technical review and support committee that assisted the Compacting States’ counsel in extensive negotiations and drafting of the Compact Decree and supporting appendix. I worked closely with counsel on developing the Index methodology and the data supporting the calculations for the Index methodology. The Compacting States’ final Compact Decree and supporting appendices are a result of my work with counsel and other Compacting State technical representatives. The statements in this Declaration are my opinions and derived from my direct involvement in developing the Compact Decree and assisting with compilation and analysis of supporting materials.

17. The Effective El Paso Index Obligation (EEPI Obligation) is a calculation that represents the annual amount of water that should be delivered to Texas under the Rio Grande Compact.

18. The Effective El Paso Index Delivery (EEPI Delivery) is a calculation that represents the annual amount of water that is actually delivered to Texas.

19. The Effective El Paso Index Departures (EEPI Departures) are the annual differences between the annual EEPI Obligations and the annual EEPI Deliveries. A positive departure represents an annual EEPI Delivery that is higher than the EEPI Obligation (an over delivery to Texas). A negative departure represents an annual EEPI Delivery that is less than the EEPI Obligation (an under delivery to Texas).

20. These departures are calculated annually. Ideally, departures would be zero in each year. However, variations in hydrologic conditions and limitations to the data used to develop the EEPI Obligation led to the development of accrued EEPI departure accounts and triggers to allow the State of New Mexico (New Mexico) to take corrective water administration action in advance of reaching thresholds in the Compact Decree that would lead to violation of the Compact Decree. As stated in section II.C of the Compact Decree, New Mexico will be in compliance with this Decree if

New Mexico is within the accrued Negative Departure Limits. Exceedance of accrued Negative Departure Limits means New Mexico is in violation of this Compact Decree.

21. My Declaration summarizes the development of EEPI components and an analysis of applying the EEPI concept to historic data from 1951 to 2021 that yielded EEPI Departures for that period. These departures are part of the development of accrued departure concepts and the associated limits and trigger concepts that are also covered in this Declaration.

22. The EEPI Obligation and EEPI Delivery each consists of five components: (1) streamflow at the Rio Grande at El Paso gage, (2) calculation of Texas Mesilla agricultural depletions from surface water diversions and groundwater pumping, (3) data related to Texas Mesilla depletions resulting from groundwater pumping for domestic, commercial, municipal, and industrial (DCMI) uses, (4) data reflecting delivery of water to Mexico under the 1906 Convention, and (5) excess flows that are not available for beneficial use.

23. The EEPI Obligation was developed based on an analysis of historic data from 1951 to 1978 (the “D2 period”). The analysis included the quantitative relationship between Caballo Releases and Rio Grande at

El Paso flow using regression analysis and estimated and calculated Rio Grande depletions in the Texas portion of the Mesilla Basin.

24. The D2 period (1951 to 1978) was chosen because this period represented a time when, on average, 57 percent of the Rio Grande Project deliveries were used in New Mexico and 43 percent of the Rio Grande Project deliveries were used in Texas. (Compact Decree, § II.A.5.) The D2 period was also the basis for the 2008 Operating Agreement, which has formed the basis for Rio Grande Project operations for over 15 years.

25. I will describe each of the inputs to the EEPI and summarize the analysis of the historic data from the D2 period (1951 to 1978) that yielded the EEPI Obligation. In addition, I will describe the EEPI Departures that were calculated by applying the EEPI concept to historic data from 1951 to 2021, and how the results of the departure analysis informed the development of the limits and triggers that will be used to measure compliance.

26. All data and calculations described in this Declaration are contained in an Excel spreadsheet named “***EEPI Declaration Spreadsheet 2022.11.02.xlsx***” attached as Attachment B which contains tabs with individual components of the EEPI, and data and calculations related to

various calculations used in applying the EEPI. Each tab is documented below.

27. The most critical element to the EEPI Obligation and EEPI Delivery is the streamflow at the Rio Grande at El Paso gage. The other four components of the EEPI Obligation and EEPI Delivery represent adjustments to the streamflow component. Once these adjustments are included, the gaged flow represents the compliance point for measuring New Mexico's compliance with the EEPI Obligation.

3.0 Rio Grande at El Paso Gage

28. The map below shows the location of the El Paso gage in relation to the state line, as well as the portion of Texas which is upstream of the El Paso gage.

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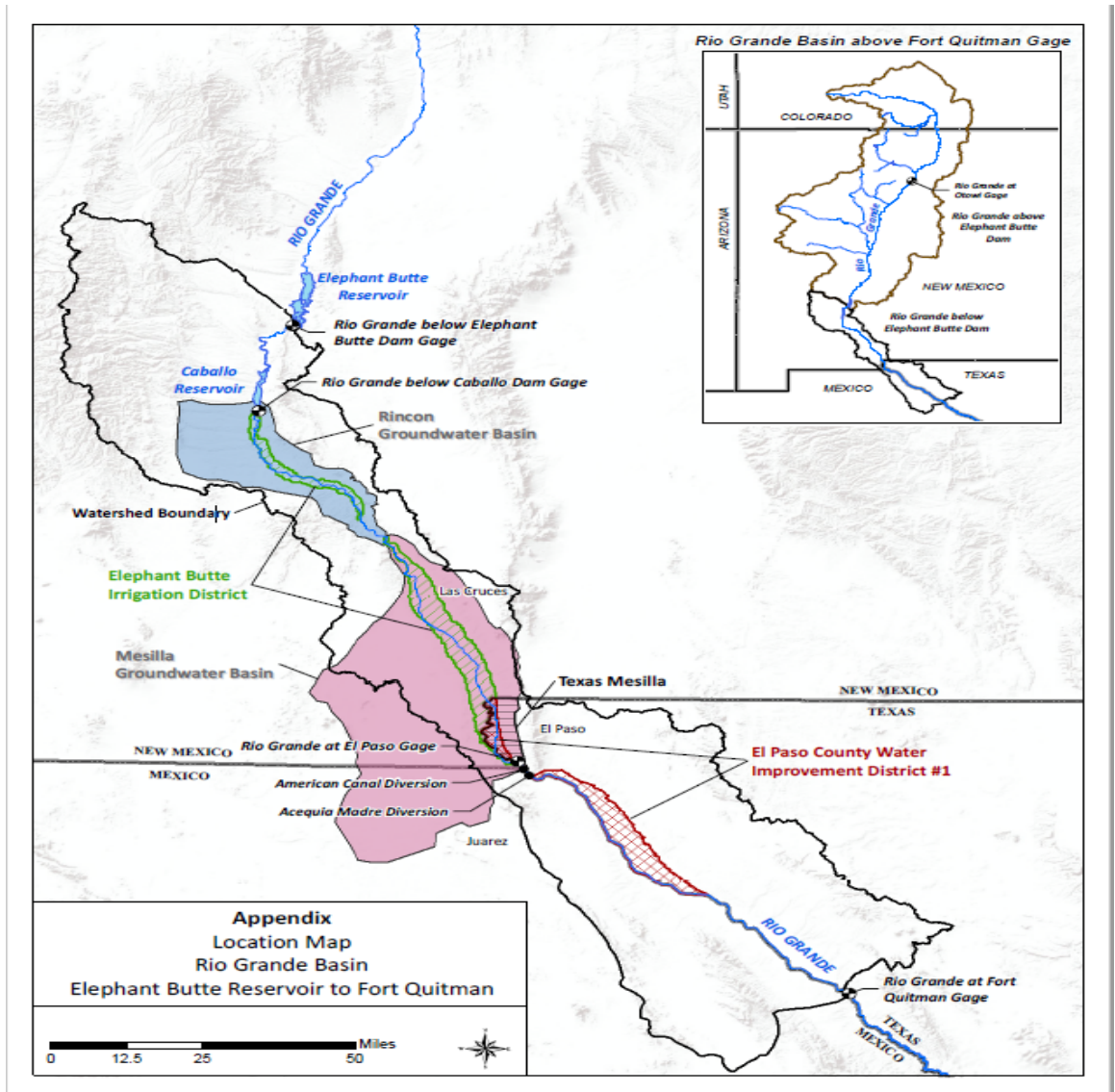
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29. Texas's apportionment under the Rio Grande Compact is released from Caballo Reservoir and flows in the Rio Grande through the Rincon Basin.

30. The Rio Grande flows through Selden Canyon from the Rincon Basin to the Mesilla Basin in New Mexico.

31. The Rio Grande flows through the El Paso Narrows from the Mesilla Basin to the El Paso Valley.

32. The Rio Grande at El Paso stream gage is in the El Paso Narrows.

33. The Rincon Basin is entirely in New Mexico.

34. Most of the Mesilla Basin is in New Mexico. A small area at the southern end of the Mesilla Basin (upstream of the El Paso Narrows) is in Texas.

35. Due to its geographic location, as well as related geologic and hydrologic features, the El Paso gage is the ideal location to measure New Mexico's compliance with the EEPI Obligation.

4.0 Components of the EEPI

36. The largest components by volume of the EEPI are the measured gage data (Rio Grande below Caballo Dam, Rio Grande at El Paso, and Acequia Madre flows). Other components of the EEPI are estimated or are calculated streamflow depletions in the Texas portion of the Mesilla Basin and the calculated "excess flows" that are not available for beneficial use in Texas.

4.1 Measured Gage Data for EEPI

37. The measured gage data for Rio Grande below Caballo Dam, Rio Grande at El Paso, and Acequia Madre flows from 1951 to 2021 are included in the associated Excel Spreadsheet in the tab named *Gaged Flows*.

4.2 Estimated and Calculated Components of EEPI

38. The estimated and calculated components of the EEPI Obligation are: (1) depletions to Rio Grande flow caused by agricultural use in the Texas portion of the Mesilla Basin; (2) depletions to Rio Grande flow caused by groundwater pumping for DCMI uses in the Texas portion of the Mesilla Basin; and (3) the excess flows that are not available for beneficial use in Texas. These components from 1951 to 2021 are included in the associated Excel Spreadsheet in the tab named *Estimated EEPI Components*.

39. The development of each of these estimated and calculated components is detailed below.

4.2.1 Texas Mesilla Agricultural Depletions

40. Texas agriculture depletions represent the annual volume of Rio Grande flow depleted or consumed as applied irrigation in the Texas portion of the Mesilla Basin.

41. The Texas Mesilla Agricultural Depletion term is calculated by multiplying the annual irrigated acreage in the Texas Mesilla (in acres) and the annual crop irrigation requirement (CIR) of irrigated land in the Texas Mesilla (in acre-feet per acre). The result is a volume in acre-feet per year (AF/yr) that is used in the calculation of the EEPI Obligation.

42. Crop and Non-Crop acreage estimates are documented in a technical memorandum.¹ The acreage estimates for cropped areas and non-cropped areas are summed to obtain the data in the column labeled Texas Mesilla Acreage Total. A time varying adjustment to annual irrigated lands from 1979 to 2014 was applied based on linear interpolation of the acreage of urban lands for the years 1979 and 2014 estimated from high resolution aerial imagery. The annual irrigated acreage of urban lands was assumed to be constant from 2014 to 2021 (i.e., 2014 values were used from 2015 to 2021). Annual irrigated acreage from 2018 to 2021 was estimated as the average annual irrigated acreage over the period 2013 to 2017.

¹ Analysis of Amount of Land Irrigated from 1951 to 1978 in the Texas Portion of the Mesilla Valley Using USBR Crop, USBR MWD, USDA Census Reports, and Aerial Photographs by Al Blair, Ph.D., P.E. (draft Jan. 9, 2021).

43. The CIR estimates labeled Sullivan & Welsh CIR are documented in the expert report²: Annual CIR values were averaged over selected periods to reduce the uncertainty and variability in the estimated CIR for individual years. Five averaging periods were selected based on consideration of historical Rio Grande Project water supply and operations: 1951 to 1978, 1979 to 2002, 2003 to 2007, 2008 to 2017, and 2018 to 2021.

44. The period 1951 to 1978 represents the D2 period that is used for calculation of the EEPI Obligation.

45. The period 1979 to 2002 was characterized by consistently wet conditions in all years, with full Rio Grande Project allocations to the New Mexico and Texas Irrigation Districts, as well as Mexico. This period also included the time when the operation and maintenance of the Rio Grande Project distribution and drainage facilities were transferred to Elephant Butte Irrigation District (EBID) and El Paso County Water Improvement District No. 1 (EPCWID).

46. The period 2003 to 2007 is characterized by less-than-full Rio Grande Project allocations and was the period that immediately preceded the implementation of the Rio Grande Project Operating Agreement.

² Expert Report of Gregory K. Sullivan, P.E. and Heidi M. Welsh (Oct. 31, 2019.)

47. The period 2008 to 2017 was characterized by less-than-full Rio Grande Project allocations. This period also represents the initial years following implementation of the Rio Grande Project Operating Agreement.

48. Annual CIR estimates were not available for the period 2018 to 2021. Annual CIR values for this period were assumed equal to the average CIR for the period 2008 to 2017.

49. Finally, the Texas Mesilla Agricultural Depletion term is calculated by multiplying the Texas Mesilla Acreage Total and the D2 period Average CIR.

50. The data and calculated Texas Mesilla Agricultural Depletions from 1951 to 2021 are included in the associated Excel Spreadsheet with the tab named *TX Mesilla Ag*.

4.2.2 Texas Mesilla DCMI Depletions - Overview

51. Texas Mesilla DCMI Depletions represent the annual volume of Rio Grande flow depleted due to groundwater pumping for DCMI uses. The Texas Mesilla Depletions include two subcomponents: (1) Canutillo Well Field pumping, and (2) other DCMI pumping. These subcomponents are treated differently because the Canutillo Well Field wells are metered and the Other DCMI wells are either not metered, or the meter records are not available.

52. In general, the depletion is calculated by the total pumping times a depletion factor minus return flows.

4.2.2.1 Texas Mesilla DCMI Depletions - Canutillo Well Field

53. The Canutillo Well Field is owned and operated by El Paso Water, the municipal water utility for the City of El Paso. All pumping from the Canutillo Well Field has been metered since the initial operation of the wells in 1952. Data were obtained from El Paso Water.

54. The depletion factor applied to the pumping is 0.95. This is an assumed factor that means that 95 percent of the pumping is sourced from induced inflow of Rio Grande surface water, and 5 percent of the pumping is sourced from reduced evapotranspiration from riparian vegetation and reduced evaporation from open water surfaces resulting from lowered groundwater levels and reduction in open water surface area. This is a long term (steady state) depletion factor and ignores the contributions of annual groundwater storage reductions to the groundwater pumping.

55. From the initial operation of the wells (1952) to 1984, some of the pumped water was discharged directly into the Rio Grande. Annual values of the amount of pumped water discharged into the Rio Grande were obtained from a report prepared by Lee Wilson and Associates, Inc. in 1986 on behalf of El Paso Water Utilities Public Service Board.

56. The depletion factor was applied to the total pumping before subtracting the “return flow” (the amount of pumped water discharged directly to the Rio Grande).

57. The metered pumping data, the volume discharged to the Rio Grande, the depletion factor, and the calculated depletion from the Canutillo Well Field from 1951 to 2021 are included in the associated Excel Spreadsheet in a tab named *Canutillo*.

4.2.2.2 Texas Mesilla DCMI Depletions – Other DCMI Groundwater Pumping

58. Groundwater pumping in the Texas Mesilla from Other DCMI wells includes groundwater pumped for use by municipalities, self-supplied domestic wells, schools, commercial (non-agricultural) businesses, industrial facilities, and other non-irrigation uses. Pumping from these Other DCMI wells are not metered or, if metered, records are generally not available. Annual pumping from Other DCMI wells was estimated by experts for New Mexico and Texas based on estimates of population, per capita use, and water use surveys conducted by the Texas Water Development Board prepared by experts for Texas and New Mexico in this matter.³

³ Expert Report of Gregory K. Sullivan, P.E. and Heidi M. Welsh (Oct. 31, 2019), and Expert Report of William Hutchison (May 31, 2019).

59. Texas Mesilla Other DCMI pumping estimates from experts from New Mexico and Texas were averaged in an acknowledgment of uncertainty, and the average was used for further calculations related to return flows and depletion factors.

60. A portion of the groundwater pumped from the Other DCMI wells returns to the Rio Grande above the Rio Grande at El Paso gage or to the hydrologically connected groundwater system in the Mesilla Basin. These Other DCMI return flows include treated wastewater effluent discharged to the Rio Grande, groundwater recharge from treated or septic effluent, and other incidental surface runoff or groundwater recharge resulting from DCMI groundwater uses. These return flows are not typically measured or estimated and limited data and information exist. Based on experience, and the fact that these are relatively low flows, a fraction of 1/3 was considered appropriate for use as a return flow factor.

61. Consistent with the Canutillo Well Field depletion factor, the depletion factor applied to the Other DCMI pumping is assumed to be 0.95. This factor means that 95 percent of the pumping is assumed to be sourced from induced inflow of Rio Grande surface water, and 5 percent of the pumping is sourced from reduced evapotranspiration from riparian vegetation and reduced evaporation from open water surfaces resulting

from lowered groundwater levels and reduction in open water surface area. This is a long term (steady state) depletion factor and ignores the contributions of annual groundwater storage reductions to the groundwater pumping.

62. The two expert report estimates of Other DCMI pumping, the average that was used for the EEPI Obligation, and the calculated Other DCMI Depletion for the period 1951 to 2021 are included in the associated Excel Spreadsheet in the tab named *Other DCMI*.

4.2.3 Excess Flow

63. The Excess Flow component of the EEPI Obligation reflects the volume of water in the Rio Grande at El Paso, excluding water delivered to Mexico at the Acequia Madre, that is either in excess of the operational capacity of the EPCWID distribution system below the Rio Grande at El Paso gage or is the result of excess release from Caballo Dam and cannot be put to beneficial use in Texas. In general, Excess Flow may result from three sources.

64. The first potential source of Excess Flow can be stormwater reaching the Rio Grande downstream of Caballo Dam and upstream of the Rio Grande at El Paso gage.

65. The second potential source of Excess Flow can be excess releases from Caballo Dam, including water released for flood control, operations and maintenance activities, or any purpose other than water released to meet orders from EBID, EPCWID, or Mexico.

66. The third potential source of Excess Flow can be operational spills or accidents, or failure of Rio Grande Project infrastructure upstream of the Rio Grande at El Paso gage.

67. The Excess Flow for the period 1951 to 1978 (D2 period) were calculated based on the operational capacity criteria. This approach quantified streamflow in the Rio Grande at El Paso, excluding water delivered to Mexico at the Acequia Madre, that cannot be diverted and used in Texas due to historic operational capacity of the American Canal and the EPCWID distribution system downstream of the Rio Grande at El Paso gage.

68. The historical operational capacity of the EPCWID distributions system downstream of the Rio Grande at El Paso gage is approximately 1,000 cubic feet per second (cfs). For the purposes of this calculation, average daily streamflow at the Rio Grande at El Paso gage, excluding daily water delivered to Mexico at the Acequia Madre, above 1,000 cfs is therefore considered excess flow. The calculated Excess Flow

from 1951 to 2021 is included in the associated Excel Spreadsheet in the tab named *Excess Flow*.

4.3 Net Streamflow at El Paso Gage

69. Acequia Madre flows and Excess Flow were subtracted from Rio Grande at El Paso flow to yield annual volumes of Net Rio Grande at the El Paso flows. These data and calculations for the period 1951 to 2021 are included in the associated Excel Spreadsheet in the tab named *Net RGEP*.

4.4 EEPI Delivery: 1951 to 2021

70. Each of the components of the EEPI Delivery using the data, estimates, and calculations for the period 1951 to 2021 described above are included in the associated Excel Spreadsheet in the tab named *EEPI Delivery*.

5.0 Caballo Release – Net Rio Grande at El Paso Regression

71. The critical component of the EEPI Obligation is the Net Rio Grande at El Paso flow that would be expected for a given Caballo release under D2 conditions. This was achieved with the establishment of a quantitative relationship between Caballo Release and the net streamflow of the Rio Grande at the El Paso gage during the D2 period (1951 to 1978). This quantitative relationship was developed using regression analysis.

72. As developed below, the initial regression analysis only considered the quantitative relationship between current year Caballo Release and the Net Flow of the Rio Grande at El Paso. Subsequent analyses suggested that the regression was improved when both the current year and prior year Caballo Release flows were included in the regression analysis.

5.1 One-Year Regression Analysis

73. The one-year regression analysis yielded a strong quantitative relationship between Net Rio Grande at El Paso flow and current-year Caballo Release.

74. The coefficient of determination (or r^2 value) was 0.93, which means that 93 percent of the variation in Net Rio Grande at El Paso flow can be described by the variation in Caballo Release. The standard error was about 24,000 AF/yr. The residuals from 1951 to 1978 were calculated as the predicted Net Rio Grande at El Paso flows minus the actual Net Rio Grande at El Paso flows. The residuals ranged between an under prediction of about 42,000 AF/yr to an over prediction of about 50,000 AF/yr.

75. The data and regression analysis associated with the one-year Net Rio Grande at El Paso flow regression are included in the associated Excel Spreadsheet in the tab named *1-yr RGEP Regression*.

76. Based on an inspection of the residuals, it appeared that the one-year regression tended to overestimate the Net Rio Grande at El Paso flows when the Caballo Release in the prior year was less than about 400,000 AF/yr, and tended to underestimate Net Rio Grande at El Paso flows when the Caballo Release in the prior year was greater than 400,000 AF/yr. As a result of this observation, a two-year regression analysis was completed.

5.2 Two-Year Regression Analysis

77. The two-year regression analysis yielded an improved quantitative relationship between Net Rio Grande at El Paso flow and current and prior year Caballo Release.

78. The coefficient of determination (or r^2 value) was 0.96, which means that 96 percent of the variation in Net Rio Grande flow can be described by variation in current and prior year Caballo Release. The standard error was about 17,000 AF/yr. The residuals from 1951 to 1978 were calculated as the predicted Net Rio Grande at El Paso flows minus the actual Net Rio Grande at El Paso flows. The residuals ranged from an

under prediction of about 35,000 AF/yr to an over prediction of about 23,000 AF/yr.

79. The two-year regression yielded an improvement in the coefficient of determination (0.96 vs. 0.93), reduced the standard error (17,000 vs. 24,000), and reduced the range of residuals. The highest under prediction improved to 35,000 AF/yr as compared to 42,000 AF/yr. The highest over prediction improved to 23,000 AF/yr as compared to 50,000 AF/yr.

80. The data and regression analysis associated with the two-year Net Rio Grande at El Paso flow regression are included in the associated Excel Spreadsheet in the tab named *2-yr RGEP Regression*.

6.0 EEPI Obligation

81. The EEPI Obligation is the amount of water Texas should receive under D2 conditions and is the sum of two major components: (1) the Net Rio Grande at El Paso flow calculated from the two-year Net Rio Grande at El Paso regression equation, and (2) the Texas Mesilla depletions.

82. The Net Rio Grande at El Paso flow regression equation was presented earlier.

83. The Texas Mesilla depletions are based on the data, estimates, and calculations presented earlier for the period 1951 to 1978.

84. Texas Mesilla Agricultural Depletions averaged 26,960 AF/yr during the D2 period (1951 to 1978), and this average is used for purposes of EEPI Obligation.

85. Texas Mesilla DCMI Depletions averaged 12,224 AF/yr during the D2 period (1951 to 1978), and this average is used for purposes of EEPI Obligation.

86. The following equation is used to calculate EEPI Obligation:

$$\begin{aligned} \text{EEPI Obligation} &= -90,149.4 & 1 \\ &+ 0.485886 * \text{Current Year Caballo Release} & 2 \\ &+ 0.113382 * \text{Prior Year Caballo Release} & 3 \\ &+ 26,860 & 4 \\ &+ 12,224 & 5 \end{aligned}$$

Where:

- ¹ = Regression Intercept
- ² and ³ = Caballo Release is actual release up to 790,000 AF/yr
- ⁴ = Average Texas Mesilla Agricultural Depletions from 1951 to 1978
- ⁵ = Average Texas Mesilla DCMI Depletions from 1951 to 1978

87. Line 1 represents the regression intercept of the two-year Net Rio Grande at El Paso flow as described in the two-year regression analysis described above.

88. Lines 2 and 3 represent the regression coefficients multiplied by the appropriate Caballo Release (current year in line 2 and prior year in

line 3). The regression coefficients from the two-year regression are described above. The Caballo Releases are limited to flows equal to or less than 790,000 AF/yr, and greater than 200,000 AF/yr. If either the current or prior year Caballo Release is greater than 790,000 AF/yr, this value is set equal to 790,000 AF/yr. If the current year Caballo Release is less than 200,000 AF/yr, there is no calculation of EEPI Obligation due to severe drought conditions.

89. Line 4 represents the average agricultural depletions in the Texas Mesilla for the years 1951 to 1978 (the D2 period). The data to calculate this average were presented earlier.

90. Line 5 represents the average DCMI depletions in the Texas Mesilla for the years 1951 to 1978 (the D2 period). The data to calculate this average are the average of the sum of the Canutillo Well Field depletions and the Other DCMI depletions presented earlier.

91. Once calculated, the EEPI Obligation is adjusted to account for changes (since the D2 period) in open water evaporation and riparian evapotranspiration between the Rio Grande below Caballo Dam stream gage and the El Paso gage. The adjustment calculation is based on a comparison of the five-year running averages of potential evapotranspiration to the baseline potential evapotranspiration from the baseline period (1951 to

1978). The baseline evapotranspiration has been calculated as 47,137 AF/yr. The adjustment is expected to be minor: a one-inch increase in potential evapotranspiration as compared to the baseline period would represent an “aridity adjustment” (decrease in EEPI Obligation) of about 384 AF/yr.

7.0 EEPI Departures and EEPI Accrued Departures

92. The Index Delivery, which is calculated at the end of a calendar year, should equal the Index Obligation. Model simulations confirm that meeting the Index Obligation is possible each year under a wide range of New Mexico groundwater pumping and surface water delivery conditions.

93. However, given the variation in hydrologic conditions and surface water delivery efficiency that cannot be precisely simulated, an exact match of Index Delivery and Index Obligation every year is unlikely.

94. Each year, the Index Departure is calculated by subtracting the Index Obligation from the Index Delivery. A Positive Departure equates to an over-delivery to Texas, and a Negative Departure equates to an under-delivery from New Mexico.

95. Over several years, the sum of EEPI Departures will result in an Accrued Positive Departure or an Accrued Negative Departure.

96. As part of the development of the EEPI, an analysis of Accrued Departures using historic data was completed and is summarized below.

7.1 EEPI Departures Analysis – 1951 to 2021

97. The data, estimates, and calculations for all the components of the EEPI presented above from 1951 to 2021 were used to calculate annual EEPI Delivery, EEPI Obligation, and EEPI Departure values.

98. These data and calculations are included in the associated Excel Spreadsheet in the tab named *EEPI Departure All*, organized as follows.

99. The current year Rio Grande below Caballo data (column B) and the prior year Rio Grande below Caballo data (column C) were used as input to the two-year regression equation to yield the estimate of Net Rio Grande at El Paso (column E). The regression coefficients are in cells P4, P5, and P6.

100. The actual Net Rio Grande at El Paso flow (column D) is also presented in order to calculate a regression residual of the Net Rio Grande flow term of the EEPI Obligation (column F). The residual is calculated as actual flow minus regression-predicted flow (column D minus column E) to conform with the EEPI Departure calculation method.

101. The EEPI Obligation (column G) is the sum of the Regression Net Rio Grande at El Paso (column E) plus the average D2 period Texas Mesilla depletions for agricultural and DCMI uses (26,860 AF/yr and 12,224 AF/yr, respectively).

102. The EEPI Delivery is presented in column H.

103. The EEPI Departure (column I) is calculated as the EEPI Delivery (column H) minus the EEPI Obligation (column G).

104. This version of the departure analysis includes all years. However, seven years (1985 to 1988 and 1994 to 1996) are spill years. Also, one year is an extremely dry year (2013) with Caballo Release less than 200,000 AF/yr which is outside the limits of the EEPI calculation (i.e. no EEPI would be calculated). In the associated Excel Spreadsheet, the tab named *EEPI Departure Filtered*, the calculations and data are unchanged, but the results from the eight years listed above are removed from the table.

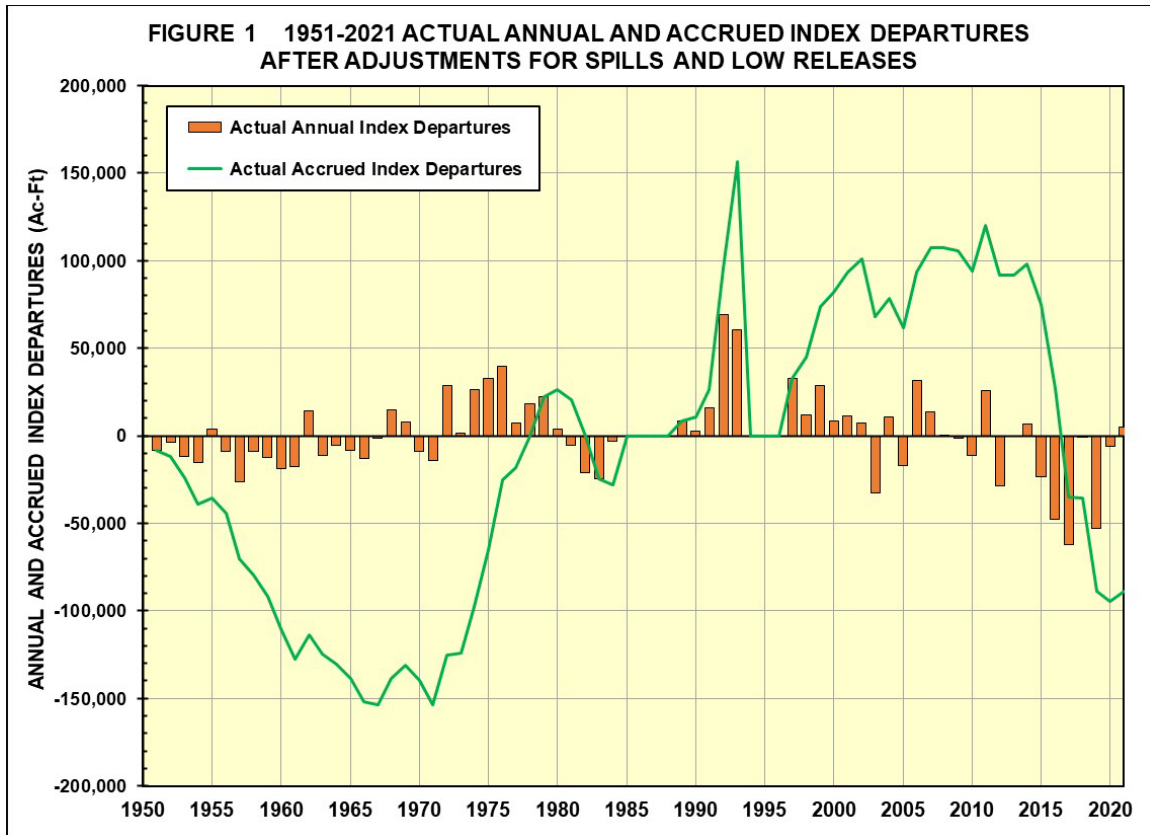
105. Figure 1 presents a graphical summary of these annual departures and accrued departures based on the methods detailed in the Compact Decree applied to the historic data from 1951 to 2021.

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106. In Figure 1, the bars represent the historical annual EEPI Departures, and the line represents the Accrued Departures, which begin with zero in 1951.

107. It is important to note that the calculated annual Index Obligation and Index Delivery values for the 1951 to 2021 period do not reflect the changes in New Mexico groundwater management that will be necessary to be consistent with the EEPI Index and the Compact Decree. Thus, while large EEPI Departures are presented with these historical data, it is expected that these differences will be reduced once the provisions of the Compact Decree and EEPI Index are implemented.

108. In Figure 1, both negative and positive EEPI Departures occur, generally clustered over multiple years. The Negative Departures are generally correlated with dry years with lower river flows (1950s and recent years). During the 1980s and 1990s, wet conditions with high river flows contributed to Positive Departures.

109. Please note that, to be consistent with the provisions of the Compact Decree, the analysis of the historic data from 1951 to 2021 includes the extinguishment of the Accrued Index Departures in years with actual or hypothetical spill (1985 to 1988 and 1994 to 1996).

110. In addition, to be consistent with the provisions of the Compact Decree, the analysis of historic data from 1951 to 2021 also includes assigning a zero EEPI Index Departure in 2013 because the Caballo Release that year was less than 200,000 AF. In an extremely dry year such as this, there is no EEPI Obligation and EEPI Delivery is not calculated.

111. Finally, to be consistent with the provisions of the Compact Decree, while the Positive Departure in 1993 was calculated to be 69,077 AF, it was capped at 67,500 AF in Figure 1. This cap is consistent with Article VI of the Compact, which limits the annual credit applied to Colorado or New Mexico's accrued debit or credit balance.

112. The Compact Decree also sets caps on Annual Negative Departures that were not exceeded in the historical data analysis. An Annual Negative Departure in excess of 112,500 AF during the first five calendar years following entry of the Compact Decree shall be treated as the equivalent of 112,500 AF for the purposes of calculating the Accrued Index Departure. An Annual Negative Departure in excess of 90,000 AF beginning in the sixth full calendar year after entry of the Compact Decree shall be treated as the equivalent of 90,000 AF for purposes of calculating the Accrued Index Departure.

113. The clustering of Annual Negative and Positive Departures results in an increase in Negative Accrued Departures (to about -150,000 AF in the late 1960s) followed by an increase in Positive Accrued Departures (to about 120,000 AF in the early 2010s) followed by an increase in Negative Accrued Departures in more recent years (to about -100,000 AF).

114. It is important to emphasize that Figure 1 reflects the nature and extent of annual departures and accrued departures based on historical data from 1951 to 2021 without implementation of the EEPI, which will include New Mexico actions that will improve conditions to the point that the EEPI Departures will be reduced.

115. To the extent that the EEPI Index defines a means to test the effectiveness of the New Mexico groundwater management actions that are contemplated, the Compact Decree includes Accrued Departure Limits that will be used to assess New Mexico's compliance.

7.2 Accrued Negative Departure Limits and Triggers for Management Action

116. The Compact Decree sets limits on the Accrued Negative Departures. Exceeding these limits would trigger action by New Mexico to achieve compliance with the Compact Decree.

117. In the first five years following entry of the Compact Decree, New Mexico may have Accrued Negative Departures up to, but not in excess of 150,000 AF. Beginning in the sixth full calendar year following entry of the Compact Decree, New Mexico may have Accrued Negative Departures up to, but not in excess of 120,000 AF. The limit in the first five years was based on the analysis of historical data (1951 to 2021) presented above in Figure 1 and discussed in the previous section. The limit that begins in the sixth year reflects the anticipated improvement in groundwater conditions in New Mexico that would, in turn, result in a reduction of surface water losses to groundwater.

118. As detailed in the Compact Decree (paragraph II.C.4.b.i), if the Negative Departure Limit (150,000 AF in the first five years or 120,000 AF

after the first five years) is exceeded in three consecutive years, New Mexico shall provide 12,000 AF of water in excess of its Index Obligation for each year that it exceeds the Accrued Negative Departure Limit. New Mexico shall have three years to provide the full 36,000 AF.

119. As detailed in the Compact Decree (paragraph II.C.4.b.ii), if the Negative Departure Limit (150,000 AF in the first five years or 120,000 AF after the first five years) is exceeded in four or more consecutive years, New Mexico shall provide 15,000 AF of water in excess of its Index Obligation for each additional the three years addressed above that it exceeds the Accrued Negative Departure Limit. New Mexico shall provide this water during the year immediately following the violation of the Accrued Negative Departure Limit.

120. New Mexico will take water management actions if the Accrued Negative Departure are greater than 80,000 AF at the end of any calendar year, which is defined in the Compact Decree as the Trigger for Water Management Action. New Mexico actions shall reduce the Accrued Negative Departures to less than 16,000 AF within six calendar years following the exceedance of the Negative Departure Trigger. New Mexico shall have discretion to determine what management actions are necessary and appropriate.

121. The Compact Decree includes provisions that provide for the consideration of the influence of Project Carryover Water for EPCWID on Accrued Negative Departures.

122. The Compact Decree also includes provisions for how Allocation Transfers between EBID (in New Mexico) and EPCWID (in Texas) will be reflected in the Accrued Negative Departure and Accrued Positive Departure balances as appropriate. These Allocation Transfers are associated with the operation of the Rio Grande Project.

8.0 Index Accounting

123. The Compact Decree includes provisions related to reporting the data necessary to support the EEPI Index calculations to the Engineer Advisors for the Compacting States. The Index Accounting provisions require the Engineer Advisors to include the results of the calculations in the annual report to the Rio Grande Compact Commission.

9.0 Conclusions

124. The EEPI Obligation quantifies the amount of water Texas should receive under D2 conditions. On average during the D2 period (1951 to 1978), 57 percent of the Rio Grande Project deliveries were used in New Mexico and 43 percent of the Rio Grande Project deliveries were used in Texas. The D2 period was also the basis for the 2008 Operating Agreement,

which has formed the basis for Rio Grande Project operations for over 15 years.

125. The EEPI Obligation is the sum of the two components: (1) results of a regression equation that quantifies how much Net Rio Grande flow at the El Paso gage should occur under D2 conditions, and (2) average Rio Grande flow depletions in the Texas portion of the Mesilla Basin during the D2 period (1951 to 1978).

126. The EEPI Delivery is the amount of water Texas actually receives each year. It is the sum of Net Rio Grande flow at the El Paso gage and the Rio Grande flow depletions in the Texas portion of the Mesilla Basin.

127. Each year, an EEPI Departure is calculated as the difference between EEPI Delivery and EEPI Obligation. Accrued Departures are calculated, and the Compact Decree includes limits on the Accrued Departures to measure compliance.

128. The EEPI approach utilizes measured data for the major components. By volume, the largest component is the measured data at the Rio Grande at El Paso gage. This gage is located in an ideal geographic, geologic, and hydrogeologic location to provide for a full accounting of all

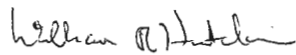
water delivered to Texas or used by Texas above the gage, and measure New Mexico's compliance with the EEPI Obligation.

129. The EEPI Index is sound and provides a comprehensive method to measure Rio Grande Compact deliveries from New Mexico to Texas. Model simulations confirm that meeting the EEPI Obligation can be achieved under a wide range of New Mexico groundwater pumping and surface water management alternatives. The implementation of the EEPI Accrued Departure Limits will provide a means to assess compliance, and the triggers and actions have been defined to address any future non-compliance.

130. The Rio Grande Compact Commission and its Engineer Advisors have the responsibility to implement the EEPI Index, including the calculations necessary to assess compliance, and, as stated in the Compact Decree (paragraph II.F.1.d) "act as provided in Article XII of the Compact."

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Executed this 27th day of August 2025, at Aberdeen, North Carolina.



William R. Hutchison, Ph.D., P.E., P.G.

ATTACHMENT A

WILLIAM R. HUTCHISON, Ph.D., P.E., P.G.

Independent Groundwater Consultant

909 Davy Street

Brenham, TX 77833

512-745-0599

billhutch@texasgw.com**EDUCATION**

University of Texas at El Paso: Ph.D., Environmental Science and Engineering, 2004-2006

University of Arizona: M.S., Hydrology, 1980-1981, 1982-1983

University of California, Davis: B.S., Soil and Water Science, 1976-1980

PROFESSIONAL LICENSES

Professional Engineer (Geological and Civil) No. 96287 (Texas)

Engineering Firm Registration No. 14526 (Texas)

Professional Geoscientist (Geology) No. 286 (Texas)

Registered Professional Geologist No. 0779 (Mississippi)

PROFESSIONAL HISTORY

Organization and Location(s)	Position(s)	Dates
Independent Groundwater Consultant Austin, TX (2012 to 2015) Aberdeen, NC (2015 to 2016) Jamaica Beach, TX (2016 to 2023) Brenham, TX (2023 to present)		2012 – pres.
LBG-Guyton Associates Austin, TX	Associate	2011 – 2012
Texas Water Development Board Austin, TX	Director, Groundwater Resources Division	2009 – 2011
El Paso Water Utilities El Paso, TX	Water Resources Manager Hydrogeology Manager Hydrogeologist	2001 – 2009
TEAM Engineering and Management, Inc. Phoenix, AZ and Bishop, CA	Senior Hydrologist	1998 – 2001
Woodward-Clyde Consultants Santa Ana, CA and Phoenix, AZ	Associate Sr. Project Hydrologist	1993 – 1998
Luhdorff & Scalmanini Consulting Engineers Woodland, CA	Principal Hydrologist Senior Hydrologist	1988 – 1993
Inyo County Water Department Bishop, CA (now in Independence, CA)	County Hydrologist	1985 – 1988
Geothermal Surveys, Inc. South Pasadena, CA	Hydrologist	1983 – 1985
University of Arizona Tucson, AZ	Research Assistant	1982 – 1983
Mobil Oil Corporation Denver, CO and Glendive, MT	Hydrologist	1981
Metropolitan Water District of Southern California Yorba Linda, California	Intern	1979

REPRESENTATIVE CONSULTING EXPERIENCE SINCE 2011

Texas v. New Mexico Litigation - Rincon and Mesilla Basins (New Mexico, Texas, Mexico)

As an expert witness for the State of Texas, developed a groundwater flow model using MODFLOW-USG along with associated pre- and post-processors. The primary objective of the model was the evaluation of the impacts of groundwater pumping in New Mexico on Rio Grande streamflow. The model used a variable grid of Voronoi cells and incorporated data and information on historic surface water and groundwater use for irrigation developed by other Texas experts. Assignments also included reviewing models and analyses of expert witnesses of New Mexico and United States. Prepared an expert report and 21 technical memoranda. The deposition on my expected testimony lasted three days. (2012 to 2021)

Texas v. New Mexico Mediation - Rincon and Mesilla Basins (New Mexico, Texas, Mexico)

Served on the Technical Committee as an expert for the State of Texas in the mediation of the Texas v. New Mexico litigation. Assignments included developing an index approach to quantitatively evaluate New Mexico compliance with the 1938 Rio Grande Compact, running additional simulations with the Texas model developed as part of this litigation, and reviewing analyses and model simulations completed by experts from New Mexico and the United States. The resulting consent decree is under judicial review. (2021 to current)

Lost Pines Groundwater Conservation District - DFC Comparison

Completed a comparison of actual groundwater monitoring data and model simulations from the desired future condition simulation. Evaluation of results will provide a foundation for future updates of the desired future conditions. (2023)

Lost Pines Groundwater Conservation District - Rules Update

Completed analyses associated with production limits that were incorporated into a rules update. Efforts included quantitative evaluations that can be used to characterize differences in the various aquifers of the district. Documentation was submitted as part of the assignment. (2022 to 2023)

Lost Pines Groundwater Conservation District - Permit Reviews

Completed simulations on submitted permit applications. Results included analysis of irrigation demands, drawdown associated with long term pumping, and groundwater budget analyses to characterize the source of the proposed pumping (induced inflows, captured outflows, and storage change). Documentation for each review was submitted for use by District staff and Board of Directors. (2022 to present)

Lost Pines Groundwater Conservation District – Litigation Support for Gatehouse Permit

At the direction of District counsel, completed analyses associated with alternative pumping scenarios for use by counsel in settling litigation associated with the permit application. Results included analysis of drawdown associated with long term pumping and groundwater budget analyses to characterize the source of the proposed pumping (induced inflows, captured outflows, and storage change). (2022 to 2023)

Lost Pines Groundwater Conservation District – Groundwater Model Development

Currently part of a team to develop a numerical model of groundwater flow and transport of the district. This effort is partially funded by a US Bureau of Reclamation grant. Expected completion is mid-2026. (2024 to present)

Lost Pines Groundwater Conservation District - Lower Colorado River Authority Groundwater Permit Contested Case Hearing

Consultant for the General Manager of the Lost Pines Groundwater Conservation District. The Lower Colorado River Authority (LCRA) submitted eight applications to the Lost Pines Groundwater Conservation District seeking authorization to withdraw 25,000 acre-feet of water per year from eight wells in Bastrop County. Dr. Hutchison was retained as an expert witness for the General Manager of the Lost Pines Groundwater Conservation District for a contested case hearing before the Texas State Office of Administrative Hearings. Dr. Hutchison prepared an expert report and pre-filed written testimony regarding the use of models to evaluate potential impacts of the proposed pumping. As part of the assignment, Dr. Hutchison reviewed model runs completed by the applicants' and protesting parties' experts. Specifically, Dr. Hutchison processed model output to assess surface water-groundwater interaction impacts, provided predicted impacts to over 2,600 registered wells in the district, and processed model output to provide predicted impact to 39 monitoring wells for use in future monitoring. Dr. Hutchison was deposed on the expert report and pre-filed testimony and testified at the hearing. (2019)

Joint Planning in Groundwater Management Areas 2, 3, 7, 11 and 13 (4th Round)

Consultant for GMAs 2, 3, 7, 11 and 13 to develop updated desired future conditions. Included in this effort are the review of aquifer conditions and uses, review of water management strategies, review of hydrologic information and data, developing future pumping estimates, updating Groundwater Availability Models and running alternative simulations with the models, and preparing explanatory reports. (2023 to present)

Bluebonnet Groundwater Conservation District – Subdivision Analysis

Based on a request by Walker County, completed an analysis of groundwater conditions for a proposed 15 lot subdivision with individual wells for each lot. The analysis used groundwater data and model results to develop a recommendation of minimum well depths to avoid dry wells in the future (2023)

Bluebonnet Groundwater Conservation District – Update to Rules and Hydrogeologic Report Guidelines

Developed an updated guideline document for preparation of Phase I and Phase II hydrogeologic reports in support of permit applications. As part of this effort, documentation of the analyses used to develop the updated guidelines was also prepared. Based on these updates, the District rules were also updated to reflect the changes (2022 to 2023)

Review of Blanco River Aquifers Assessment Tool

Part of a review panel for the development of a collection of numerical and statistical models that simulate basin-scale watershed processes and stream discharge routing calculations combined with loss and gain estimates in the Blanco River and Onion Creek basins in central Texas. The surface water model was coupled with a MODFLOW 6 model. (2021 to 2024)

Groundwater Permit Application

Prepared a hydrogeologic report in support of a permit application for a new water well in Newton County, Texas. The report was completed in compliance with the requirements of the Southeast Texas Groundwater Conservation District guidelines. The report covered the hydrogeologic setting, proposed well construction, and the simulation of the proposed pumping. Simulation results included estimates of drawdown, subsidence in the area and at specific nearby wells sites. A water budget analysis of the proposed pumping was also included. (2021)

Groundwater Management Plan for Middle Pecos Groundwater Conservation District

Consultant to the Middle Pecos Groundwater Conservation District in Pecos County, Texas in the preparation of updates to their management plan. In 2020, the assignment required revising the previous plan in terms of format and content to reflect updated policies related to updated management zone boundaries, special permit conditions, and comparisons of monitoring data to the adopted desired future conditions. In 2025, the assignment required an update to the 2020 plan. After public hearings, the plans were approved by the District Board of Directors, and final administrative completeness approval were obtained by the Texas Water Development Board. (2020 and 2025)

Groundwater Management Activities in Kinney County, Texas

Consultant to the Kinney County Groundwater Conservation District. Assignments included completion of three management plan updates, reviewed permit applications, and initiated a data collection effort. (2013 to 2025)

Update to Groundwater Availability Model for the Southern Carrizo-Wilcox Aquifer

Principal Hydrogeologist for a team of consultants developing an updated flow model for the Southern Carrizo-Wilcox Aquifer (GMA 13 area of Texas) under a contract with the Texas Water Development Board. The updated model uses MODFLOW 6 and will address documented issues with the current model related to outcrop area calibration, surface water-groundwater interactions, and application to long-term predictive simulations. (2019 to 2024)

Additional Updates to Groundwater Availability Model for the Southern Carrizo-Wilcox Aquifer

GMA 13 identified additional updates and improvements to the GAM. To date, work has included updates based on new data in Webb County, new pumping data from Wintergarden GCD, and correcting unreasonable values of transmissivity. After an initial round of public comment on the updated model, other issues related to locations of wells in Gonzales, Guadalupe, and Caldwell counties were identified and are currently being addressed in a new update. (2024 to present)

Update to Groundwater Availability Model for the Northern Carrizo-Wilcox Aquifer

Principal Hydrogeologist for a team of consultants developing an updated flow model for the Northern Carrizo-Wilcox Aquifer (GMA 11 area of Texas) under a contract with the Texas Water Development board. The updated model used MODFLOW 6 and addressed documented issues with the old model related to outcrop area calibration, surface water-groundwater interactions, and application to long-term predictive simulations. (2017 to 2020)

Groundwater Monitoring Thresholds in Pecos County, Texas

Reviewed historic groundwater data and model results to develop a groundwater monitoring plan, including regulatory thresholds and triggers, for eleven specific monitoring wells. The regulatory thresholds were used in the settlement of several years of litigation between the Middle Pecos Groundwater Conservation District and a permit applicant. Implementation of the settlement continues with the development of an expanded monitoring program, including expansion of establishing a baseline of groundwater quality, spring flow, and vertical gradients. (2017 to present)

Groundwater Model for Pecos County, Texas

Developing a groundwater model that covers all aquifers in Pecos County. Currently, the five aquifers in the county are covered in four regional groundwater models which limits the ability to fully understand the vertical connection between the aquifers. Initial geologic work to focus and improve the complex faulting and structure has been completed by other District consultants. Work on developing a numerical groundwater flow model is underway. (2019 to present)

Joint Planning in Groundwater Management Areas 2, 3, 4, 7, and 11 (3rd Round)

Consultant for GMAs 2, 3, 4, 7, and 11 to develop updated desired future conditions. Included in this effort are the review of aquifer conditions and uses, review of water management strategies, review of hydrologic information and data, developing future pumping estimates, running alternative simulations with the Groundwater Availability Models, and preparing explanatory reports. (2019 to 2021)

Joint Planning in Groundwater Management Areas 2, 3, 4, 7, 11, and 13 (2nd Round)

Consultant for GMAs 2, 3, 4, 7, 11 and 13 to develop updated desired future conditions. Included in this effort were the review of aquifer conditions and uses, review of water management strategies, review of hydrologic information and data, developing future pumping estimates, running alternative simulations with the Groundwater Availability Models, and preparing explanatory reports. (2012 to 2018)

Groundwater Flow and Transport Model of Lower Rio Grande Valley

Principal Hydrogeologist for a team of consultants that developed a flow and transport model for the Lower Rio Grande Valley using MODFLOW-USG under a contract for the Texas Water Development Board. The model objectives included the simulation of 23 water management strategies related to proposed fresh groundwater development and brackish groundwater desalination plants. Simulation results included quantitative estimates of groundwater elevation changes, changes in salinity, and impacts to surface water flows. (2015 to 2017).

Groundwater Availability Model Development using MODFLOW-USG

As a consultant to the Hickory Underground Water Conservation District No. 1, Dr. Hutchison worked with staff of the Texas Water Development Board in the development of the Groundwater Availability Model for the Llano Uplift Aquifers. This model was developed with MODFLOW-USG. (2013 to 2016)

Groundwater Model Reviews in Pecos County, Texas

Reviewed two existing groundwater models for Middle Pecos Groundwater Conservation District: one developed by the USGS in 2014, and one developed by a team of consultants in 2011. The models were evaluated in terms of how they could be used for predictive simulations in support of developing desired future conditions and in support of permit applications. (2016 to 2017)

Joint Planning Support for Bluebonnet Groundwater Conservation District, Lower Trinity Groundwater Conservation District, Southeast Texas Groundwater Conservation District

Dr. Hutchison provides consulting services to the Bluebonnet Groundwater Conservation District (Austin, Grimes, Waller, and Walker counties), the Lower Trinity Groundwater Conservation District (Polk and San Jacinto counties), and Southeast Texas Groundwater Conservation District (Hardin, Jasper, Newton, and Tyler counties) to support the joint planning process in Groundwater Management Area 14. In 2018, completed analyses and simulations related to a proposal to revise the desired future conditions pursuant to a request by Lone Star Groundwater Conservation District. The request to revise the desired future conditions adopted in 2016 was part of the settlement of litigation over the reasonableness of the desired future conditions. The requested revision was reviewed, and documented, and various alternative revisions were simulated using inverse runs of the Groundwater Availability Model to provide perspective on the requested revision. Work continued in 2020 and 2021 in the support of these districts in the development of new desired future conditions by Groundwater Management Area 14 that were adopted in 2022. As part of the proposal of a GMA-wide multi metric desired future condition, work has included documenting the approach to develop district-specific desired future conditions and the link between planning, management, and regulation. (2018 to 2022)

Hydrogeologic Study of Val Verde County, Texas

Completed a hydrogeologic study of the Edwards-Trinity (Plateau) Aquifer in Val Verde County for the County of Val Verde and City of Del Rio. The study included developing, calibrating, and applying a groundwater flow model of the area to assess impacts of proposed pumping on local spring flow and Rio Grande flows. (2013 to 2014)

Subsidence Analysis for Bluebonnet Groundwater Conservation District

As part of a rules revision that simplified the permitting process for small diameter wells and included more detailed requirements to consider subsidence analysis in the permit review process, simulations have been completed to estimate the maximum pumping that would avoid subsidence using the Houston Area Groundwater Model, which had been adopted by TWDB as the Groundwater Availability Model for the northern portion of the Gulf Coast Aquifer. (2014 to 2015)

Comparison of Groundwater Monitoring Data with Groundwater Model Results

As part of the current round of joint groundwater planning, completed assignments for groundwater conservation districts in Groundwater Management Area 9 and Groundwater Management Area 13 to compare groundwater monitoring data with groundwater model results from the desired future conditions process. These efforts examined, in detail, the various assumptions used in developing the initial round of desired future conditions adopted in 2010. (2012 to 2013)

Groundwater Transport Permit Review

A private landowner submitted a permit application to transport 22,500 acre-feet per year of groundwater from Austin and Waller Counties to the cities of Richmond and Rosenberg in Fort Bend County. Dr. Hutchison completed the technical review of the application for the Bluebonnet Groundwater Conservation District as part of a contested case hearing. The applicant subsequently withdrew the application. (2012 to 2014)

Groundwater Model Review Panel

Participated as a member of the Groundwater Review Panel for the Edwards Aquifer Authority related to the new finite element model being developed for the Edwards Aquifer by Southwest Research Institute. (2012 to 2015)

Well Classification Study and Hydrogeologic Report Guidelines Update

Over 2,500 wells in the Bluebonnet Groundwater Conservation District (Austin, Grimes, Waller and Walker Counties) were evaluated to determine the aquifer completion interval by comparing the screened interval with various groundwater models of the region (Carrizo-Wilcox, Queen City, Sparta, Yegua-Jackson, and Gulf Coast). The results of this evaluation were used to update and enhance the review process of permit applications submitted to the district. (2012 to 2014)

Rules Update for Bluebonnet Groundwater Conservation District

Based on the well classification study and the review of the groundwater transport permit (please see above), the Board of Directors completed a revision to the district rules that simplified the permitting process for small diameter wells and included more detailed requirements to consider subsidence analysis in the permit review process. (2014)

Mine Dewatering Groundwater Pumping Permit

Hickory Underground Water Conservation District No. 1 received a permit application from Premier Silica LLC to pump groundwater for dewatering associated with an expansion of an existing aggregate mine in the Brady area. Dr. Hutchison was retained to review the groundwater model that has been developed in support of the permit application, and to review the impact of the proposed pumping on the adopted desired future condition for the Hickory Aquifer. (2012 to 2013)

Evaluation of a Proposed Groundwater Development Project in East Texas

Completed an evaluation of potential effects of a proposed groundwater development project located in Anderson, Cherokee, and Houston counties in east Texas for the Neches & Trinity Valleys Groundwater Conservation District. Consultants for the project proponents and the Texas Water Development Board (TWDB) had previously completed simulations of the proposed pumping using the Groundwater Availability Model (GAM) of the Northern Carrizo-Wilcox Aquifer. Neches & Trinity Valleys Groundwater Conservation District asked for the completion of three tasks: 1) review TWDB GAM run reports, including the GAM run model run that was used to establish Desired Future Conditions, and the GAM run that was used to evaluate the regional effects of the proposed project, 2) extend the previous analyses of the project proponent's consultant and the TWDB by evaluating the effects of the proposed pumping on specific wells, and 3) recommend and monitoring network. The analysis was presented to the Neches & Trinity Valleys Groundwater Conservation District and was presented at the GMA 11 petition hearing in February 2012. (2011 to 2012)

Groundwater Management Plan for Red River Groundwater Conservation District

Consultant to the Red River Groundwater Conservation District in Fannin and Grayson Counties in the preparation of their initial management plan. This assignment required compiling and organizing the goals, objectives, and performance measures from management plans of neighboring districts, preparing a handout for Board members, and reviewing the various approaches with the Board in an open workshop session. Based on the discussion, a draft plan was prepared and approved by the Board. The review draft was subsequently approved by the Texas Water Development Board with no changes. The public hearing and final approval were completed by District personnel as a means of reducing costs. (2012)

Evaluation of Groundwater Availability using Groundwater Budget Analysis

Completed a groundwater budget analysis to provide data and information pertaining to groundwater availability for a private property owner in California. The analysis involved identifying and quantifying individual components of the inflows to and outflows from the defined area. Based on an analysis of precipitation and groundwater elevation changes, a series of historic groundwater budgets were developed for 20-year periods ranging from 1949-1968 to 1991-2010. The analysis was extended to estimate changes to the groundwater budget, generally, and groundwater elevations, specifically under alternative groundwater pumping scenarios from the subject property. (2011 to 2012)

REPRESENTATIVE AGENCY EXPERIENCE (EPWU and TWDB, 2001 to 2011)

Joint Groundwater Planning in Texas (1st Round)

In 2005, the Texas Legislature adopted HB 1763, which required that groundwater conservation districts within each groundwater management area adopt desired future conditions by September 1, 2010. The Texas Water Development Board provided technical assistance to this process. As Director of the Groundwater Resources Division, Dr. Hutchison was responsible for coordinating the effort of division staff and took the lead in 9 of the 15 Groundwater Management Areas. Technical support included developing and running groundwater models to estimate impacts of alternative pumping scenarios and attending meetings to discuss and interpret the results of these analyses. Partly because of the technical support provided by the Groundwater Resources Division staff, all desired future conditions were adopted prior to the statutory deadline. (2009 to 2010)

Challenges to the Reasonableness of Desired Future Conditions in Texas

Prepared technical reports related to petitions challenging the reasonableness of desired future conditions for Groundwater Management Area 1 (Ogallala Aquifer) and Groundwater Management Area 9 (Edwards Group of the Edwards-Trinity (Plateau) Aquifer). These petitions were filed with the Texas Water Development Board in accordance with statute and agency rules. The technical analysis was submitted to the Board for consideration in their deliberations as to the reasonableness of the adopted desired future condition. (2009 to 2010)

Modeled Available Groundwater Development in Texas

Managed development of modeled available groundwater estimates that were based on the desired future conditions adopted by the groundwater conservation districts. These estimates, required by statute, include estimating the total pumping that will achieve the desired future condition and estimating the exempt use of the area. Prior to the 2011 legislative session, these estimates were termed Managed Available Groundwater, and represented the amount of groundwater available for permitting, and were calculated as the total pumping minus the exempt use. (2010 to 2011)

Update of the Hueco Bolson Model in Chihuahua, New Mexico and Texas

Completed an update of the USGS model of the Hueco Bolson (Texas, New Mexico, and Chihuahua) by extending the model period to 2002. The model was used to complete simulations of alternative groundwater management strategies. Based on the results of this work, recommendations were developed regarding long-term groundwater management strategies for the Hueco Bolson. (2001 to 2003)

Groundwater Availability Model Updates in Texas

Completed updates to groundwater availability models in support of the Joint Groundwater Planning Process in Texas. Updated models included: Dockum Aquifer, Edwards-Trinity (Plateau) Aquifer and Pecos Valley Aquifer, Barton Springs Segment of the Edwards (Balcones Fault Zone) Aquifer, Kinney County portions of the Edwards (Balcones Fault Zone) Aquifer and Edwards-Trinity (Plateau) Aquifer, and Southern Gulf Coast Aquifer (GMA 16 portion). These models were updated because the existing models proved to be inadequate for assisting the groundwater conservation districts in developing desired future conditions. (2009 to 2010)

Groundwater Model of the Dell City, Texas Area

Developed a regional groundwater flow model covering a large area in Hudspeth and Culberson Counties, Texas and Otero County, New Mexico. This objective of this groundwater model was to develop a more complete understanding of the hydrogeology of the karstic aquifer in the region, and develop data and information related to acquiring property and water rights for a potential groundwater importation project for the City of El Paso. In 2016, the model was adopted by the Texas Water Development Board as the official Groundwater Availability Model for the Bone Spring-Victorio Peak Aquifer. (2001 to 2008)

Hueco Bolson Evaluation, Texas

Completed analyses of groundwater flow and groundwater quality of the Hueco Bolson covering west Texas, southern New Mexico, and northern Chihuahua. These analyses included evaluating historic groundwater flow patterns, mapping current groundwater quality in three dimensions, evaluating historic groundwater quality changes caused by pumping, and changes in the groundwater budget including induced inflow from the Rio Grande. Prepared comprehensive report of findings that was peer reviewed by a 5-member panel. Results included the finding that the reduction in groundwater pumping from 1989 to 2002 had fundamentally changed conditions in the Hueco Bolson. Moreover, the assumptions that were the foundation of a conclusion made in a 1979 analysis (depletion of fresh groundwater by 2030) were no longer applicable. (2001 to 2004)

Mesilla Bolson Groundwater Management, El Paso, Texas

Completed analyses of groundwater flow and groundwater quality of the Mesilla Bolson in west Texas and southern New Mexico. These analyses included evaluating previous groundwater models developed for a variety of objectives and analyzing the role of the Rio Grande in the recharge of the Mesilla. As a result of the analyses a series of piezometers were constructed to improve data coverage and long-term monitoring of the area. In addition, limitations to previous models were identified, and work is currently underway to better incorporate the known hydrostratigraphy in an updated and improved model of the area. (2001 to 2009)

Model Documentation of Groundwater Availability Models in Texas

Completed documentation of the Hueco Bolson and Mesilla Bolson groundwater flow models (Texas, New Mexico, and Chihuahua). These models had been previously developed and were designated as official Groundwater Availability Models (GAM) for the Hueco-Mesilla Aquifer by the Texas Water Development Board. Documentation was needed to fully satisfy the requirements of the Texas Water Development Board. (2001 to 2004)

Brackish Groundwater Well Location, El Paso, Texas

Completed analyses of the Hueco Bolson related to locations of new wells for use in the Kay Bailey Hutchison Desalination Plant, a joint project between El Paso Water Utilities and Fort Bliss. After initial concerns were raised by Fort Bliss, an investigation was completed in cooperation with the US Army Corps of Engineers to evaluate five alternative well field locations. The wells were sited to meet the dual objectives of producing a targeted quantity of brackish groundwater for treatment and establishing a hydraulic barrier to prevent further movement of brackish groundwater into areas with municipal wells. Based on this analysis, an alternative was selected and agreed upon. (2003)

Desalination Concentrate Injection Wells in El Paso, Texas

Completed preliminary analyses of impacts from injection wells that were proposed for use as part of the Kay Bailey Hutchison Desalination Plant in El Paso, Texas. The analyses included the development of a simple numerical flow model based on a subsurface geologic model developed by researchers at UTEP from gravity data and on the results from slug tests completed during a test hole drilling project funded and managed by the US Army Corps of Engineers. These analyses were incorporated into the Environmental Impact Statement (EIS) for the overall project. Based on the results of the analysis, a full-size injection well was constructed and tested to obtain better data to support authorization from the Texas Commission on Environmental Quality (TCEQ) under the Underground Injection Control (UIC) program. Once authorization was obtained, two additional wells were constructed, and all three wells were equipped and tested. Issues related to the potential for mineral precipitation in the well bores and reservoir were evaluated with a combination of geochemical modeling, experiments with formation samples, formation water and concentrate, and monitoring of initial operation. (2004 to 2009)

Simulations of Potential Desalination Plant in Mission Valley, El Paso, Texas

Completed a preliminary analysis of a proposed desalination plant in the Mission Valley area of El Paso. This analysis consisted of simulating three potential configurations of well fields to assess impacts to groundwater elevations and gradients, and to estimate potential impacts to the groundwater budget of the area. Based on this analysis, and a companion engineering analysis completed by a consultant, future pre-design work was recommended. (2003)

Impacts of Climate Variability and Climate Change in El Paso, Texas

Analyzed the reliability of El Paso's municipal water supplies under a wide range of climate scenarios, including integration of the Intergovernmental Panel on Climate Change (IPCC) projections for the region. Because El Paso practices conjunctive use management, the analysis included evaluation of impacts to both surface water (Rio Grande) and groundwater impacts. The analysis included developing simulated Rio Grande flows entering Elephant Butte reservoir based on a published 1000-yr tree ring record, developing a simple reservoir operations model to estimate Elephant Butte outflows and El Paso municipal diversions, estimating groundwater pumping, and simulating groundwater storage changes using a groundwater model. A total of 60 climatic scenarios were developed. Each scenario was simulated under 958 50-year simulations for a total of 57,480 simulations. The results demonstrated the effectiveness of the investments in water infrastructure and the efficacy of the management approach that has been developed over the last several decades in meeting municipal water demands over a wide range of climatic conditions. (2007 to 2008)

Region E Water Planning, Far West Texas

Developed the conceptual approach of an Integrated Water Management Strategy for El Paso County that was used in the 2005 Regional Water Plan for Far West Texas. Working with Far West Texas Regional Planning Group and their consultants, the conceptual plan was used to develop six specific alternatives designed to meet expected increased water demands in El Paso County through 2060. Alternatives ranged from reliance on single existing sources to a balanced approach that relied on numerous sources, including importation from Hudspeth, Culberson, Jeff Davis, and Presidio Counties. (2004 to 2005)

Well Construction

Managed a well construction and equipping program while employed by El Paso Water Utilities that resulted in:

- Drilling of 50 test holes.
- Construction of 14 monitoring wells.
- Construction of 3 multi-zone piezometers.
- Construction and equipping of 16 fresh groundwater production wells.
- Construction and equipping of 32 brackish groundwater production wells.

Well designs and construction management were completed in-house. Equipping design and construction management were supervised by a consulting engineer. (2001 to 2009)

REPRESENTATIVE CONSULTING EXPERIENCE (1983 to 2001)

Owens Valley, California

Hydrology consultant to the Inyo County (California) Board of Supervisors, Water Department, Water Commission and Environmental Health Department from 1985 to 1999 on issues related to water resources management and protection in the Owens Valley and Death Valley regions, including a key role in the development and negotiation of an historic water management agreement between Inyo County and the City of Los Angeles for the Owens Valley and the preparation of the associated environmental documentation. Assignments also included review and analysis of the Anheuser-Busch groundwater export project in the Cartago area, review and analysis of the groundwater pumping proposed by OLSAC in the Cottonwood Creek area, review and analysis of the groundwater export project proposed by Western Water in the Olancho area, and many others. Many of these assignments included the development and application of groundwater models and the development of monitoring networks and environmental triggers and thresholds to manage the pumping operations. (1985 to 1999)

Owens Valley Indian Reservation Groundwater Modeling

Completed local scale groundwater models of three Indian Reservations in the Owens Valley, California. The regional model developed by the USGS was used as a starting point for these models. The initial phase consisted of using Telescopic Mesh Refinement to define the boundary conditions of the three local scale models. Subsequent phases included enhancing and updating the local scale models. The preliminary model of the Big Pine area was used to evaluate potential increases in pumping that are associated with the Big Pine Ditch System project. (2000 to 2006)

Los Angeles Aqueduct Simulation Model

Consultant to the California State Water Resources Control Board related to the Mono Basin Water rights decision, a court ordered review of water rights licenses held by the City of Los Angeles. Working in partnership with State Board staff and Board members, hydrologic analyses were completed, and a simulation model (LAAMP) of the Mono Basin and Los Angeles Aqueduct system was developed and applied to evaluate the impacts of alternative water rights decisions. The simulation model was accepted by all parties involved in the process and was ultimately used in the final water rights decision that resulted in decreased diversions in order to maintain fish flows and restore lake elevation. (1992 to 1994)

Tri-Valley Groundwater Evaluation, Mono County, California

Completed a preliminary groundwater model for the Tri-Valley Groundwater Management District in Mono County, California. This model was based on existing data and was used to preliminarily evaluate the potential impacts of a proposed groundwater export project. Based on the model results, additional data requirements were identified and recommended for Phase 2 of the project. (2000 to 2001)

Evaluation of Impacts of Increased Capacity of Salinas Dam, California

Completed analyses related to the evaluation of potential downstream impacts of increased storage capacity of the Salinas Dam in central California. These analyses included estimates of reduced spills associated with the increased storage, evaluating the relationship of river flows and groundwater levels in the Atascadero area, and estimating potential groundwater level impacts that may result from the reduced spills. The analyses were summarized in an Environmental Impact Report, and in several technical appendices to the EIR. Because the work involved modification of a water right held by the City of San Luis Obispo, expert witness testimony was given at the California State Water Resources Control Board. (1997 to 1999)

Aggregate Mine Expansion, Ventura County, California

Consultant to Ventura County (California) Resource Management Agency on the analysis of potential hydrologic impacts of the expansion of an aggregate mine. Concerns had been raised about the potential impact of the mine expansion on seawater intrusion and nitrate contamination. The assignment began with the review of a groundwater model prepared by the project proponent's consultant. As a result of the review, the existing analyses was expanded with the development of a site-specific groundwater model to enhance the simulation of the potential impacts on nearby spreading facilities, the development of a solute transport model, the completion of a risk assessment of potential groundwater pollution, and the preparation of the water resources and water quality sections of an Environmental Impact Report. (1995 to 1996)

Simulation of Impacts of Tunnel Construction, California

Developed a finite element model for the Metropolitan Water District of Southern California using FRAC3DVS to simulate groundwater inflow during the construction of the Inland Feeder East Tunnel near San Bernardino, California. The model was calibrated under steady-state conditions using groundwater level data from geotechnical boreholes constructed during the design-phase geotechnical investigation. The model was calibrated under transient conditions using tunnel inflow data and groundwater level changes caused by groundwater inflow into the tunnel. Based on the model results, recommendations were made regarding grouting operations for later phases of construction. (1996 to 2002)

Los Osos Groundwater Model

Updated and enhanced a groundwater model and developed a groundwater management plan for the three water purveyors in Los Osos, California (Southern California Water Co, S&T Mutual Water Company, and Los Osos Community Services District). The original model had been developed in 1987 by the USGS, and the updated version was used to address specific management questions related to construction and operation of a sewer project, seawater intrusion, conjunctive use strategies, and the need to import surface water. (1997 to 2000)

San Benito County Groundwater Evaluation, California

Conducted a countywide evaluation of the groundwater resources of San Benito County, California. This effort included the evaluation of surface water and groundwater quantity and quality, development and calibration of a basin wide numerical model of the groundwater system, and the evaluation of recharge patterns altered by the delivery of supplemental surface water, some of which is used for direct groundwater recharge. At the completion of the model and report, expert witness testimony was given in a groundwater rights lawsuit between a developer and the local water district. Four years after the model was completed, the County requested that the model be updated and enhanced. (1991 to 1992, 1996)

San Luis Obispo Groundwater Evaluation

Completed analyses related to a proposed increase in groundwater pumping in the San Luis Obispo area of central California. The initial analysis consisted of integrating potential local groundwater pumping increases into the reservoir operations planning model used by the City of San Luis Obispo to identify conjunctive use opportunities and limitations. The second phase of the analysis consisted of developing and calibrating a groundwater model of the entire groundwater basin. This model was then used to identify potential impacts of increased pumping on groundwater levels in nearby wells, potential reductions in streamflow, and potential subsidence effects. (2000 to 2001)

Cadiz Valley Groundwater Exploration and Development

Completed a comprehensive groundwater exploration and development project in the Cadiz Valley near the Fenner Gap in the Mojave Desert region of southeastern California. Exploration work included review of available information and data on groundwater conditions and geology. An extensive geophysical study using shallow ground temperatures was completed and results were used to select drilling sites. Three test holes were drilled, and two production wells were constructed and tested. Based on the results of the investigations, a report was prepared, and a groundwater budget of the area was estimated. Sixteen years later, assisted the Metropolitan Water District of Southern California in the review of a proposed groundwater storage and recovery project in the Cadiz Valley. As part of this assignment, the groundwater model that had been developed to evaluate the feasibility and potential impacts of the project was modified and enhanced. (1983 to 1984, 2000 to 2001)

Groundwater Management Spreadsheet Models

Developed management tools in the form of empirical models that can be run in a spreadsheet format for the Soquel Creek Water District in central California, and the Vista Irrigation District in southern California. The models were designed to provide a tool for Soquel Creek Water District to manage their groundwater pumping with the objective of preventing seawater intrusion, and by Vista Irrigation District to conjunctively use local surface water, local groundwater, and imported water (1988 to 1991).

Groundwater Storage Project Evaluation in Southeastern California

Developed groundwater models for four basins in southeastern California to evaluate the feasibility of storing Colorado River water for the Metropolitan Water District of Southern California. These models were used to simulate the storage of water in wet years, “holding” the water for 5 to 10 years, then extracting after the “hold” period. Models were developed for the Hayfield, Palen, Chuckwalla, and Rice Valleys. Based on the initial modeling work, a focused field investigation was completed in the Hayfield Valley area, the site chosen as the most desirable. (1996 to 2001)

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ATTACHMENT B

Year	Rio Grande below Caballo Dam (AF/yr)	Rio Grande at El Paso (AF/yr)	Acequia Madre (AF/yr)
1951	469,455	251,990	33,064
1952	543,979	283,631	49,891
1953	528,620	264,577	37,791
1954	244,155	93,723	10,147
1955	219,156	67,083	8,183
1956	246,139	57,453	7,862
1957	397,092	139,578	23,284
1958	737,127	392,848	60,054
1959	687,409	385,869	60,111
1960	705,161	378,148	60,313
1961	561,695	300,805	48,616
1962	651,940	376,150	60,081
1963	517,169	263,707	39,694
1964	206,081	64,304	6,652
1965	505,606	202,389	36,674
1966	610,330	308,776	49,606
1967	456,585	232,740	29,825
1968	505,673	264,404	39,667
1969	667,658	365,402	59,898
1970	661,118	360,713	60,075
1971	498,375	244,156	34,845
1972	260,902	133,568	16,070
1973	617,462	301,788	59,993
1974	640,852	382,954	60,050
1975	580,607	360,959	60,063
1976	679,684	402,831	60,161
1977	417,495	214,553	24,815
1978	356,169	156,025	14,904
1979	568,687	312,594	60,043
1980	658,694	353,983	60,043
1981	608,163	333,329	60,267
1982	643,169	326,643	59,267
1983	648,380	331,956	60,624
1984	653,151	359,362	58,590
1985	677,397	359,917	60,282
1986	1,396,165	1,048,973	66,171
1987	1,376,100	1,076,182	65,880
1988	838,011	570,032	61,927
1989	736,865	428,248	58,868
1990	680,106	391,901	58,353

Year	Rio Grande below Caballo Dam (AF/yr)	Rio Grande at El Paso (AF/yr)	Acequia Madre (AF/yr)
1991	625,956	372,078	59,242
1992	734,981	470,359	58,080
1993	823,244	508,005	63,763
1994	893,383	508,594	60,166
1995	1,096,145	702,426	63,619
1996	774,335	446,835	60,064
1997	798,621	483,092	59,441
1998	808,661	456,585	60,629
1999	735,467	457,373	58,308
2000	751,373	433,257	60,612
2001	786,559	453,491	61,038
2002	801,147	473,506	60,325
2003	364,528	172,330	26,948
2004	399,520	186,902	27,613
2005	676,031	329,797	58,091
2006	434,228	278,511	27,117
2007	636,730	337,852	51,245
2008	675,356	377,851	53,684
2009	693,667	382,039	57,726
2010	659,246	363,823	56,385
2011	396,843	230,397	25,724
2012	371,515	132,946	23,072
2013	168,639	57,452	3,765
2014	306,050	105,270	17,923
2015	434,855	170,508	33,402
2016	545,476	228,375	43,783
2017	623,080	270,499	52,589
2018	491,560	262,485	39,493
2019	453,971	177,495	39,721
2020	593,110	294,899	50,924
2021	229,892	104,300	12,827

Rio Grande below Caballo Dam: USBR Data

(https://www.usbr.gov/uc/water/hydrodata/gage_data/site_map.html)

Rio Grande at El Paso: IBWC Data (https://www.ibwc.gov/Water_Data/histflo1.htm)**Acequia Madre: IBWC Data (https://www.ibwc.gov/Water_Data/histflo1.htm)**

Year	Texas Mesilla Agricultural Depletions (AF/yr)	Texas Mesilla DCMI Depletions (AF/yr)	Excess Flow (AF/yr)
1951	31,034	202	0
1952	30,589	370	1,870
1953	31,556	265	3,069
1954	27,703	1,057	0
1955	27,823	350	296
1956	25,528	9,342	0
1957	25,648	10,201	8,466
1958	27,287	8,553	25,255
1959	27,279	11,598	10,295
1960	25,919	13,664	6,573
1961	25,093	13,859	6,904
1962	26,291	14,325	13,298
1963	26,728	15,212	2,817
1964	26,637	17,847	0
1965	26,432	18,649	1,260
1966	26,730	15,586	11,823
1967	26,133	13,621	4,245
1968	26,858	12,764	3,279
1969	27,195	12,498	6,795
1970	27,017	14,337	4,803
1971	26,631	16,078	139
1972	26,011	17,147	0
1973	26,490	14,908	3,124
1974	26,171	13,631	6,147
1975	25,887	14,852	5,353
1976	25,605	17,485	1,095
1977	25,746	20,487	0
1978	24,063	23,395	986
1979	23,425	21,518	9,420
1980	22,584	21,435	670
1981	23,151	18,805	1,341
1982	22,801	19,863	615
1983	22,837	18,352	0
1984	22,086	16,830	3,096
1985	21,403	17,121	1,533
1986	21,343	16,418	364,405
1987	21,994	18,508	440,737
1988	20,144	18,976	64,285
1989	20,529	21,457	6,579

Year	Texas Mesilla Agricultural Depletions (AF/yr)	Texas Mesilla DCMI Depletions (AF/yr)	Excess Flow (AF/yr)
1990	19,004	17,723	4,876
1991	21,274	15,899	3,869
1992	22,456	13,985	2,618
1993	22,393	16,411	6,081
1994	22,384	21,240	36,634
1995	22,308	24,122	166,654
1996	19,517	26,383	7,346
1997	20,449	23,299	13,753
1998	20,520	24,959	7,242
1999	19,993	22,709	17,109
2000	18,942	25,436	11,075
2001	15,167	24,623	4,513
2002	14,879	23,348	22,266
2003	12,148	25,494	0
2004	13,294	22,812	484
2005	13,496	21,558	975
2006	12,432	25,010	20,415
2007	12,770	22,014	318
2008	13,379	23,050	11,223
2009	12,566	24,890	872
2010	12,626	22,990	6,597
2011	12,138	25,588	3
2012	9,991	26,024	0
2013	11,887	26,729	0
2014	11,134	25,177	0
2015	10,487	23,764	59
2016	11,006	22,334	2,403
2017	11,206	22,953	683
2018	11,131	23,672	84
2019	11,131	24,076	447
2020	11,131	27,691	0
2021	11,144	30,543	0

DCMI = Domesitic, Commercial, Municipal, and Industrial

Year	Texas Mesilla Crop Acreage	Texas Mesilla Non-Crop Acreage	Texas Mesilla Acreage Total	Sullivan & Welsh CIR (AF/ac)	D2 Period Average CIR (AF/ac)	Texas Mesilla Agricultural Depletion (AF/yr)
1951	10,436	1,500	11,936	2.51	2.60	31,034
1952	10,265	1,500	11,765	2.53	2.60	30,589
1953	10,637	1,500	12,137	2.63	2.60	31,556
1954	9,155	1,500	10,655	2.63	2.60	27,703
1955	9,201	1,500	10,701	2.40	2.60	27,823
1956	8,318	1,500	9,818	2.70	2.60	25,528
1957	8,364	1,500	9,864	2.19	2.60	25,648
1958	8,995	1,500	10,495	2.05	2.60	27,287
1959	8,992	1,500	10,492	2.61	2.60	27,279
1960	8,469	1,500	9,969	2.57	2.60	25,919
1961	8,151	1,500	9,651	2.46	2.60	25,093
1962	8,612	1,500	10,112	2.54	2.60	26,291
1963	8,780	1,500	10,280	2.34	2.60	26,728
1964	8,745	1,500	10,245	2.64	2.60	26,637
1965	8,666	1,500	10,166	2.70	2.60	26,432
1966	8,781	1,500	10,281	2.52	2.60	26,730
1967	8,551	1,500	10,051	2.56	2.60	26,133
1968	8,830	1,500	10,330	2.40	2.60	26,858
1969	8,960	1,500	10,460	2.39	2.60	27,195
1970	8,891	1,500	10,391	2.83	2.60	27,017
1971	8,743	1,500	10,243	3.06	2.60	26,631
1972	8,504	1,500	10,004	2.80	2.60	26,011
1973	8,689	1,500	10,189	2.82	2.60	26,490
1974	8,566	1,500	10,066	2.68	2.60	26,171
1975	8,457	1,500	9,957	2.87	2.60	25,887
1976	8,348	1,500	9,848	2.97	2.60	25,605
1977	8,402	1,500	9,902	2.78	2.60	25,746
1978	7,755	1,500	9,255	2.59	2.60	24,063
1979	7,499	1,511	9,010	2.66	2.60	23,425
1980	7,199	1,487	8,686	2.80	2.60	22,584
1981	7,440	1,464	8,904	2.82	2.60	23,151
1982	7,329	1,440	8,769	2.87	2.60	22,801
1983	7,367	1,417	8,784	2.77	2.60	22,837
1984	7,101	1,393	8,494	2.58	2.60	22,086
1985	6,862	1,370	8,232	2.39	2.60	21,403
1986	6,862	1,347	8,209	2.32	2.60	21,343
1987	7,136	1,323	8,459	2.40	2.60	21,994
1988	6,448	1,300	7,748	2.33	2.60	20,144
1989	6,619	1,276	7,896	2.50	2.60	20,529
1990	6,056	1,253	7,309	2.33	2.60	19,004

Year	Texas Mesilla Crop Acreage	Texas Mesilla Non-Crop Acreage	Texas Mesilla Acreage Total	Sullivan & Welsh CIR (AF/ac)	D2 Period Average CIR (AF/ac)	Texas Mesilla Agricultural Depletion (AF/yr)
1991	6,953	1,230	8,182	2.28	2.60	21,274
1992	7,431	1,206	8,637	2.48	2.60	22,456
1993	7,430	1,183	8,613	2.60	2.60	22,393
1994	7,450	1,159	8,609	2.85	2.60	22,384
1995	7,444	1,136	8,580	3.10	2.60	22,308
1996	6,394	1,112	7,507	2.81	2.60	19,517
1997	6,776	1,089	7,865	2.57	2.60	20,449
1998	6,827	1,066	7,892	2.56	2.60	20,520
1999	6,647	1,042	7,690	2.51	2.60	19,993
2000	6,267	1,019	7,285	2.49	2.60	18,942
2001	4,838	995	5,834	2.72	2.60	15,167
2002	4,751	972	5,723	2.64	2.60	14,879
2003	3,958	949	4,906	2.73	2.48	12,148
2004	4,444	925	5,369	2.46	2.48	13,294
2005	4,549	902	5,451	2.44	2.48	13,496
2006	4,143	878	5,021	2.28	2.48	12,432
2007	4,303	855	5,158	2.46	2.48	12,770
2008	3,947	831	4,778	2.68	2.80	13,379
2009	3,680	808	4,488	2.80	2.80	12,566
2010	3,725	785	4,509	2.74	2.80	12,626
2011	3,574	761	4,335	3.08	2.80	12,138
2012	2,831	738	3,568	3.12	2.80	9,991
2013	3,531	714	4,245	2.78	2.80	11,887
2014	3,285	691	3,976	2.85	2.80	11,134
2015	3,054	691	3,745	2.48	2.80	10,487
2016	3,240	691	3,931	2.82	2.80	11,006
2017	3,311	691	4,002	2.66	2.80	11,206
2018	3,284	691	3,975	2.72	2.80	11,131
2019	3,284	691	3,975	2.72	2.80	11,131
2020	3,284	691	3,975	2.72	2.80	11,131
2021	3,284	691	3,980	2.72	2.80	11,144

CIR = Consumptive Irrigation Requirement

Year	Total Canutillo Well Field Pumping (AF/yr)	Pumped Water Discharged to Rio Grande (AF/yr)	Depletion Factor	Canutillo Well Field Depletion (AF/yr)
1951	0	0	0.95	0
1952	2,435	2,203	0.95	110
1953	5,826	5,626	0.95	-91
1954	7,061	6,122	0.95	586
1955	3,648	3,648	0.95	-182
1956	9,271	0	0.95	8,807
1957	10,162	0	0.95	9,654
1958	9,550	1,115	0.95	7,957
1959	13,988	2,269	0.95	11,019
1960	15,690	1,866	0.95	13,040
1961	16,133	2,330	0.95	12,996
1962	17,076	2,861	0.95	13,361
1963	20,999	5,716	0.95	14,233
1964	22,188	4,355	0.95	16,723
1965	20,671	2,687	0.95	16,951
1966	19,289	4,122	0.95	14,203
1967	24,277	11,387	0.95	11,676
1968	16,147	4,403	0.95	10,936
1969	14,197	2,601	0.95	10,886
1970	18,804	5,418	0.95	12,446
1971	25,291	9,798	0.95	14,229
1972	23,626	7,025	0.95	15,420
1973	19,937	5,764	0.95	13,176
1974	17,596	4,631	0.95	12,086
1975	19,133	4,763	0.95	13,413
1976	18,008	1,149	0.95	15,959
1977	25,257	5,887	0.95	18,107
1978	26,817	3,642	0.95	21,834
1979	22,272	1,050	0.95	20,108
1980	20,914	121	0.95	19,748
1981	18,221	0	0.95	17,310
1982	19,743	0	0.95	18,756
1983	18,298	93	0.95	17,290
1984	17,974	1,418	0.95	15,657
1985	16,660	0	0.95	15,827
1986	15,822	0	0.95	15,031
1987	17,894	0	0.95	16,999
1988	18,338	0	0.95	17,421
1989	20,841	0	0.95	19,799

Year	Total Canutillo Well Field Pumping (AF/yr)	Pumped Water Discharged to Rio Grande (AF/yr)	Depletion Factor	Canutillo Well Field Depletion (AF/yr)
1990	16,920	0	0.95	16,074
1991	15,024	0	0.95	14,273
1992	12,956	0	0.95	12,308
1993	15,477	0	0.95	14,703
1994	20,526	0	0.95	19,500
1995	23,605	0	0.95	22,425
1996	26,019	0	0.95	24,718
1997	22,772	0	0.95	21,633
1998	24,509	0	0.95	23,284
1999	22,136	0	0.95	21,029
2000	24,682	0	0.95	23,448
2001	23,823	0	0.95	22,632
2002	22,591	0	0.95	21,461
2003	25,053	0	0.95	23,800
2004	22,221	0	0.95	21,110
2005	20,871	0	0.95	19,827
2006	24,489	0	0.95	23,265
2007	21,339	0	0.95	20,272
2008	22,430	0	0.95	21,309
2009	24,376	0	0.95	23,157
2010	22,410	0	0.95	21,290
2011	25,241	0	0.95	23,979
2012	25,768	0	0.95	24,480
2013	26,521	0	0.95	25,195
2014	24,924	0	0.95	23,678
2015	23,437	0	0.95	22,265
2016	21,929	0	0.95	20,833
2017	22,583	0	0.95	21,454
2018	23,332	0	0.95	22,165
2019	23,763	0	0.95	22,575
2020	27,568	0	0.95	26,190
2021	30,570	0	0.95	29,042

Year	Sullivan & Welsh Estimate (AF/yr)	Hutchison Estimate (AF/yr)	Average of Sullivan & Welsh and Hutchison (AF/yr)	Other DCMI Annual Depletion (AF/yr)
1951	342	313	328	202
1952	455	388	422	260
1953	769	388	578	357
1954	1,139	388	764	471
1955	1,213	511	862	532
1956	1,222	511	866	534
1957	1,261	511	886	547
1958	1,417	514	966	595
1959	1,145	731	938	578
1960	1,331	694	1,012	624
1961	2,017	782	1,399	863
1962	2,417	709	1,563	964
1963	2,251	922	1,586	978
1964	2,857	787	1,822	1,124
1965	2,749	2,757	2,753	1,698
1966	2,423	2,061	2,242	1,383
1967	3,244	3,064	3,154	1,945
1968	3,046	2,882	2,964	1,828
1969	2,797	2,430	2,613	1,612
1970	3,207	2,927	3,067	1,891
1971	3,148	2,850	2,999	1,850
1972	2,966	2,636	2,801	1,727
1973	2,952	2,664	2,808	1,732
1974	2,729	2,283	2,506	1,545
1975	2,576	2,089	2,333	1,438
1976	2,879	2,072	2,475	1,526
1977	4,125	3,596	3,860	2,381
1978	2,887	2,176	2,531	1,561
1979	2,663	1,909	2,286	1,410
1980	3,089	2,383	2,736	1,687
1981	2,750	2,098	2,424	1,495
1982	2,293	1,296	1,795	1,107
1983	2,222	1,219	1,721	1,061
1984	2,400	1,404	1,902	1,173
1985	2,395	1,803	2,099	1,294
1986	2,437	2,062	2,250	1,387
1987	2,621	2,273	2,447	1,509
1988	2,737	2,307	2,522	1,555
1989	2,879	2,498	2,689	1,658

Year	Sullivan & Welsh Estimate (AF/yr)	Hutchison Estimate (AF/yr)	Average of Sullivan & Welsh and Hutchison (AF/yr)	Other DCMI Annual Depletion (AF/yr)
1990	2,867	2,481	2,674	1,649
1991	2,792	2,481	2,637	1,626
1992	2,956	2,481	2,719	1,677
1993	3,058	2,481	2,770	1,708
1994	3,163	2,481	2,822	1,740
1995	3,024	2,481	2,752	1,697
1996	2,920	2,481	2,701	1,665
1997	2,919	2,481	2,700	1,665
1998	2,951	2,481	2,716	1,675
1999	2,965	2,481	2,723	1,679
2000	3,084	3,363	3,223	1,988
2001	3,124	3,334	3,229	1,991
2002	3,130	2,988	3,059	1,887
2003	3,234	2,259	2,747	1,694
2004	3,057	2,462	2,759	1,702
2005	3,117	2,496	2,807	1,731
2006	3,205	2,456	2,830	1,745
2007	3,206	2,443	2,824	1,742
2008	3,213	2,435	2,824	1,741
2009	3,223	2,399	2,811	1,733
2010	3,272	2,243	2,757	1,700
2011	3,273	1,947	2,610	1,609
2012	3,283	1,725	2,504	1,544
2013	3,252	1,725	2,488	1,534
2014	3,136	1,725	2,430	1,499
2015	3,136	1,725	2,430	1,499
2016	3,145	1,725	2,435	1,501
2017	3,136	1,725	2,430	1,499
2018	3,161	1,725	2,443	1,506
2019	3,143	1,725	2,434	1,501
2020	3,144	1,725	2,434	1,501
2021	3,146	1,725	2,435	1,502

Assumed Depletion Factor = 0.95

Assumed Return Flow Factor = 1/3

Calculated Depletion = (Pumping*Depletion Factor)-(Pumping * Return Flow Factor)

Year	Excess Flow (AF/yr)
1951	0
1952	1,870
1953	3,069
1954	0
1955	296
1956	0
1957	8,466
1958	25,255
1959	10,295
1960	6,573
1961	6,904
1962	13,298
1963	2,817
1964	0
1965	1,260
1966	11,823
1967	4,245
1968	3,279
1969	6,795
1970	4,803
1971	139
1972	0
1973	3,124
1974	6,147
1975	5,353
1976	1,095
1977	0
1978	986
1979	9,420
1980	670
1981	1,341
1982	615
1983	0
1984	3,096
1985	1,533
1986	364,405
1987	440,737
1988	64,285
1989	6,579
1990	4,876
1991	3,869
1992	2,618

Year	Excess Flow (AF/yr)
1993	6,081
1994	36,634
1995	166,654
1996	7,346
1997	13,753
1998	7,242
1999	17,109
2000	11,075
2001	4,513
2002	22,266
2003	0
2004	484
2005	975
2006	20,415
2007	318
2008	11,223
2009	872
2010	6,597
2011	3
2012	0
2013	0
2014	0
2015	59
2016	2,403
2017	683
2018	84
2019	447
2020	0
2021	0

Year	Rio Grande at El Paso (AF/yr)	Acequia Madre (AF/yr)	Excess Flow (AF/yr)	Net Rio Grande at El Paso (AF/yr)
1951	251,990	33,064	0	218,926
1952	283,631	49,891	1,870	231,870
1953	264,577	37,791	3,069	223,717
1954	93,723	10,147	0	83,576
1955	67,083	8,183	296	58,604
1956	57,453	7,862	0	49,591
1957	139,578	23,284	8,466	107,829
1958	392,848	60,054	25,255	307,539
1959	385,869	60,111	10,295	315,463
1960	378,148	60,313	6,573	311,261
1961	300,805	48,616	6,904	245,285
1962	376,150	60,081	13,298	302,771
1963	263,707	39,694	2,817	221,197
1964	64,304	6,652	0	57,652
1965	202,389	36,674	1,260	164,455
1966	308,776	49,606	11,823	247,347
1967	232,740	29,825	4,245	198,670
1968	264,404	39,667	3,279	221,458
1969	365,402	59,898	6,795	298,709
1970	360,713	60,075	4,803	295,836
1971	244,156	34,845	139	209,172
1972	133,568	16,070	0	117,498
1973	301,788	59,993	3,124	238,670
1974	382,954	60,050	6,147	316,757
1975	360,959	60,063	5,353	295,543
1976	402,831	60,161	1,095	341,575
1977	214,553	24,815	0	189,738
1978	156,025	14,904	986	140,135
1979	312,594	60,043	9,420	243,131
1980	353,983	60,043	670	293,270
1981	333,329	60,267	1,341	271,721
1982	326,643	59,267	615	266,761
1983	331,956	60,624	0	271,332
1984	359,362	58,590	3,096	297,675
1985	359,917	60,282	1,533	298,102
1986	1,048,973	66,171	364,405	618,396
1987	1,076,182	65,880	440,737	569,565
1988	570,032	61,927	64,285	443,819
1989	428,248	58,868	6,579	362,800
1990	391,901	58,353	4,876	328,672
1991	372,078	59,242	3,869	308,967
1992	470,359	58,080	2,618	409,661

Year	Rio Grande at El Paso (AF/yr)	Acequia Madre (AF/yr)	Excess Flow (AF/yr)	Net Rio Grande at El Paso (AF/yr)
1993	508,005	63,763	6,081	438,161
1994	508,594	60,166	36,634	411,793
1995	702,426	63,619	166,654	472,153
1996	446,835	60,064	7,346	379,425
1997	483,092	59,441	13,753	409,898
1998	456,585	60,629	7,242	388,713
1999	457,373	58,308	17,109	381,956
2000	433,257	60,612	11,075	361,569
2001	453,491	61,038	4,513	387,941
2002	473,506	60,325	22,266	390,915
2003	172,330	26,948	0	145,382
2004	186,902	27,613	484	158,804
2005	329,797	58,091	975	270,731
2006	278,511	27,117	20,415	230,979
2007	337,852	51,245	318	286,289
2008	377,851	53,684	11,223	312,944
2009	382,039	57,726	872	323,441
2010	363,823	56,385	6,597	300,841
2011	230,397	25,724	3	204,670
2012	132,946	23,072	0	109,874
2013	57,452	3,765	0	53,687
2014	105,270	17,923	0	87,348
2015	170,508	33,402	59	137,047
2016	228,375	43,783	2,403	182,189
2017	270,499	52,589	683	217,228
2018	262,485	39,493	84	222,908
2019	177,495	39,721	447	137,327
2020	294,899	50,924	0	243,975
2021	104,300	12,827	0	91,473

Year	Net Rio Grande at El Paso (AF/yr)	Texas Mesilla Agricultural Depletion (AF/yr)	Canutillo Well Field Depletion (AF/yr)	Other Texas Mesilla DDMI Annual Depletion (AF/yr)	EEPI Delivery from 1979 to 2021 (AF/yr)
1951	218,926	31,034	0	202	250,162
1952	231,870	30,589	110	260	262,830
1953	223,717	31,556	-91	357	255,539
1954	83,576	27,703	586	471	112,336
1955	58,604	27,823	-182	532	86,776
1956	49,591	25,528	8,807	534	84,461
1957	107,829	25,648	9,654	547	143,677
1958	307,539	27,287	7,957	595	343,379
1959	315,463	27,279	11,019	578	354,340
1960	311,261	25,919	13,040	624	350,845
1961	245,285	25,093	12,996	863	284,237
1962	302,771	26,291	13,361	964	343,387
1963	221,197	26,728	14,233	978	263,136
1964	57,652	26,637	16,723	1,124	102,136
1965	164,455	26,432	16,951	1,698	209,536
1966	247,347	26,730	14,203	1,383	289,663
1967	198,670	26,133	11,676	1,945	238,423
1968	221,458	26,858	10,936	1,828	261,080
1969	298,709	27,195	10,886	1,612	338,402
1970	295,836	27,017	12,446	1,891	337,190
1971	209,172	26,631	14,229	1,850	251,881
1972	117,498	26,011	15,420	1,727	160,657
1973	238,670	26,490	13,176	1,732	280,068
1974	316,757	26,171	12,086	1,545	356,558
1975	295,543	25,887	13,413	1,438	336,282
1976	341,575	25,605	15,959	1,526	384,665
1977	189,738	25,746	18,107	2,381	235,971
1978	140,135	24,063	21,834	1,561	187,594
1979	243,131	23,425	20,108	1,410	288,074
1980	293,270	22,584	19,748	1,687	337,288
1981	271,721	23,151	17,310	1,495	313,677
1982	266,761	22,801	18,756	1,107	309,424
1983	271,332	22,837	17,290	1,061	312,521
1984	297,675	22,086	15,657	1,173	336,591
1985	298,102	21,403	15,827	1,294	336,626
1986	618,396	21,343	15,031	1,387	656,157
1987	569,565	21,994	16,999	1,509	610,068
1988	443,819	20,144	17,421	1,555	482,940
1989	362,800	20,529	19,799	1,658	404,785

Year	Net Rio Grande at El Paso (AF/yr)	Texas Mesilla Agricultural Depletion (AF/yr)	Canutillo Well Field Depletion (AF/yr)	Other Texas Mesilla DCMI Annual Depletion (AF/yr)	EEPI Delivery from 1979 to 2021 (AF/yr)
1990	328,672	19,004	16,074	1,649	365,399
1991	308,967	21,274	14,273	1,626	346,141
1992	409,661	22,456	12,308	1,677	446,101
1993	438,161	22,393	14,703	1,708	476,966
1994	411,793	22,384	19,500	1,740	455,418
1995	472,153	22,308	22,425	1,697	518,583
1996	379,425	19,517	24,718	1,665	425,326
1997	409,898	20,449	21,633	1,665	453,645
1998	388,713	20,520	23,284	1,675	434,192
1999	381,956	19,993	21,029	1,679	424,657
2000	361,569	18,942	23,448	1,988	405,947
2001	387,941	15,167	22,632	1,991	427,731
2002	390,915	14,879	21,461	1,887	429,142
2003	145,382	12,148	23,800	1,694	183,024
2004	158,804	13,294	21,110	1,702	194,910
2005	270,731	13,496	19,827	1,731	305,785
2006	230,979	12,432	23,265	1,745	268,421
2007	286,289	12,770	20,272	1,742	321,073
2008	312,944	13,379	21,309	1,741	349,372
2009	323,441	12,566	23,157	1,733	360,897
2010	300,841	12,626	21,290	1,700	336,458
2011	204,670	12,138	23,979	1,609	242,396
2012	109,874	9,991	24,480	1,544	145,889
2013	53,687	11,887	25,195	1,534	92,303
2014	87,348	11,134	23,678	1,499	123,658
2015	137,047	10,487	22,265	1,499	171,298
2016	182,189	11,006	20,833	1,501	215,530
2017	217,228	11,206	21,454	1,499	251,387
2018	222,908	11,131	22,165	1,506	257,711
2019	137,327	11,131	22,575	1,501	172,533
2020	243,975	11,131	26,190	1,501	282,797
2021	91,473	11,144	29,042	1,502	133,161

Year	Rio Grande at Caballo (AF/yr)	Net Rio Grande at El Paso (AF/yr)	Regression Net Rio Grande at El Paso (AF/yr)	Residual (AF/yr)
1951	469,455	218,926	195,237	-23,689
1952	543,979	231,870	234,652	2,782
1953	528,620	223,717	226,529	2,811
1954	244,155	83,576	76,080	-7,496
1955	219,156	58,604	62,859	4,255
1956	246,139	49,591	77,129	27,538
1957	397,092	107,829	156,966	49,137
1958	737,127	307,539	336,805	29,266
1959	687,409	315,463	310,510	-4,953
1960	705,161	311,261	319,898	8,637
1961	561,695	245,285	244,022	-1,263
1962	651,940	302,771	291,751	-11,020
1963	517,169	221,197	220,473	-724
1964	206,081	57,652	55,943	-1,709
1965	505,606	164,455	214,357	49,902
1966	610,330	247,347	269,744	22,396
1967	456,585	198,670	188,430	-10,239
1968	505,673	221,458	214,392	-7,065
1969	667,658	298,709	300,064	1,355
1970	661,118	295,836	296,605	769
1971	498,375	209,172	210,533	1,360
1972	260,902	117,498	84,937	-32,561
1973	617,462	238,670	273,516	34,846
1974	640,852	316,757	285,886	-30,870
1975	580,607	295,543	254,024	-41,519
1976	679,684	341,575	306,424	-35,151
1977	417,495	189,738	167,757	-21,981
1978	356,169	140,135	135,323	-4,813

SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0.964058
R Square	0.929408
Adjusted R	0.926693
Standard E	23818.28
Observatio	28

ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>ignificance F</i>
Regression	1	1.94E+11	1.94E+11	342.3139	1.73E-16
Residual	26	1.48E+10	5.67E+08		
Total	27	2.09E+11			

	<i>Coefficients</i>	<i>andard Err</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>ower 95.0%</i>	<i>pper 95.0%</i>
Intercept	-53049.3	15154.06	-3.50067	0.001693	-84199	-21899.7	-84199	-21899.7
X Variable :	0.528883	0.028586	18.50173	1.73E-16	0.470124	0.587641	0.470124	0.587641

min	-41,519
max	49,902

Year	Current Year Rio Grande at Caballo (AF/yr)	Prior Year Rio Grande at Caballo (AF/yr)	Net Rio Grande at El Paso (AF/yr)	Regression Net Rio Grande at El Paso (AF/yr)	Residual (AF/yr)
1951	469,455	719,339	218,926	219,513	586
1952	543,979	469,455	231,870	227,390	-4,480
1953	528,620	543,979	223,717	228,377	4,660
1954	244,155	528,620	83,576	88,418	4,842
1955	219,156	244,155	58,604	44,019	-14,585
1956	246,139	219,156	49,591	54,295	4,703
1957	397,092	246,139	107,829	130,700	22,871
1958	737,127	397,092	307,539	313,034	5,495
1959	687,409	737,127	315,463	327,430	11,968
1960	705,161	687,409	311,261	330,419	19,158
1961	561,695	705,161	245,285	262,723	17,439
1962	651,940	561,695	302,771	290,306	-12,465
1963	517,169	651,940	221,197	235,055	13,858
1964	206,081	517,169	57,652	68,620	10,968
1965	505,606	206,081	164,455	178,883	14,429
1966	610,330	505,606	247,347	263,728	16,381
1967	456,585	610,330	198,670	200,899	2,230
1968	505,673	456,585	221,458	207,319	-14,139
1969	667,658	505,673	298,709	291,591	-7,118
1970	661,118	667,658	295,836	306,780	10,944
1971	498,375	661,118	209,172	226,963	17,791
1972	260,902	498,375	117,498	93,126	-24,372
1973	617,462	260,902	238,670	239,448	778
1974	640,852	617,462	316,757	291,241	-25,516
1975	580,607	640,852	295,543	264,621	-30,922
1976	679,684	580,607	341,575	305,930	-35,645
1977	417,495	679,684	189,738	189,770	32
1978	356,169	417,495	140,135	130,245	-9,890

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.983413
R Square	0.9671
Adjusted R	0.964468
Standard E	16582.32
Observatio	28

ANOVA

	df	SS	MS	F	ignificance F
Regression	2	2.02E+11	1.01E+11	367.4429	2.92E-19
Residual	25	6.87E+09	2.75E+08		
Total	27	2.09E+11			

	Coefficients	andard Error	t Stat	P-value	Lower 95%	Upper 95%	ower 95.0%	pper 95.0%
Intercept	-90149.4	12623.96	-7.14113	1.75E-07	-116149	-64149.8	-116149	-64149.8
X Variable :	0.485886	0.021462	22.63955	3.57E-18	0.441685	0.530087	0.441685	0.530087
X Variable :	0.113382	0.021186	5.351806	1.5E-05	0.069749	0.157016	0.069749	0.157016

min	-35,645
max	22,871

A Year	B C D E F G H I EEPI Obligation Calculations						EEPI Delivery (AF/yr)	EEPI Departure (AF/yr)
	Current Year Rio Grande at Caballo (AF/yr)	Prior Year Rio Grande at Caballo (AF/yr)	Net Rio Grande at El Paso (AF/yr)	Regression Net Rio Grande at El Paso (AF/yr)	Regression Residual (AF/yr)	EEPI Obligation (AF/yr)		
1951	469,455	719,339	218,926	219,513	-586	258,597	250,162	-8,435
1952	543,979	469,455	231,870	227,390	4,480	266,474	262,830	-3,645
1953	528,620	543,979	223,717	228,377	-4,660	267,461	255,539	-11,922
1954	244,155	528,620	83,576	88,418	-4,842	127,502	112,336	-15,167
1955	219,156	244,155	58,604	44,019	14,585	83,103	86,776	3,673
1956	246,139	219,156	49,591	54,295	-4,703	93,379	84,461	-8,917
1957	397,092	246,139	107,829	130,700	-22,871	169,784	143,677	-26,107
1958	737,127	397,092	307,539	313,034	-5,495	352,118	343,379	-8,739
1959	687,409	737,127	315,463	327,430	-11,968	366,514	354,340	-12,175
1960	705,161	687,409	311,261	330,419	-19,158	369,503	350,845	-18,658
1961	561,695	705,161	245,285	262,723	-17,439	301,807	284,237	-17,571
1962	651,940	561,695	302,771	290,306	12,465	329,390	343,387	13,998
1963	517,169	651,940	221,197	235,055	-13,858	274,139	263,136	-11,002
1964	206,081	517,169	57,652	68,620	-10,968	107,704	102,136	-5,568
1965	505,606	206,081	164,455	178,883	-14,429	217,967	209,536	-8,432
1966	610,330	505,606	247,347	263,728	-16,381	302,812	289,663	-13,149
1967	456,585	610,330	198,670	200,899	-2,230	239,983	238,423	-1,560
1968	505,673	456,585	221,458	207,319	14,139	246,403	261,080	14,677
1969	667,658	505,673	298,709	291,591	7,118	330,675	338,402	7,727
1970	661,118	667,658	295,836	306,780	-10,944	345,864	337,190	-8,674
1971	498,375	661,118	209,172	226,963	-17,791	266,047	251,881	-14,166
1972	260,902	498,375	117,498	93,126	24,372	132,210	160,657	28,447
1973	617,462	260,902	238,670	239,448	-778	278,532	280,068	1,536
1974	640,852	617,462	316,757	291,241	25,516	330,325	356,558	26,233
1975	580,607	640,852	295,543	264,621	30,922	303,705	336,282	32,577
1976	679,684	580,607	341,575	305,930	35,645	345,014	384,665	39,651
1977	417,495	679,684	189,738	189,770	-32	228,854	235,971	7,117
1978	356,169	417,495	140,135	130,245	9,890	169,329	187,594	18,265
1979	568,687	356,169	243,131	226,551	16,580	265,635	288,074	22,439
1980	658,694	568,687	293,270	294,380	-1,110	333,464	337,288	3,824
1981	608,163	658,694	271,721	280,033	-8,311	319,117	313,677	-5,440
1982	643,169	608,163	266,761	291,312	-24,551	330,396	309,424	-20,972
1983	648,380	643,169	271,332	297,813	-26,481	336,897	312,521	-24,377
1984	653,151	648,380	297,675	300,723	-3,047	339,807	336,591	-3,216
1985	677,397	653,151	298,102	313,044	-14,943	352,128	336,626	-15,502
1986	1,396,165	677,397	618,396	370,506	247,891	409,590	656,157	246,567
1987	1,376,100	1,396,165	569,565	383,273	186,292	422,357	610,068	187,711
1988	838,011	1,376,100	443,819	383,273	60,546	422,357	482,940	60,583

Intercept-90149.4

X Variable 1 (Column B)0.485886

X Variable 2 (Column C)0.113382

Avg D2 TX Mesilla Ag Depletions26860

Avg D2 TX Mesilla DCMI Depletions12224

Sum of All Constants-51065.4

	Net RGEP f EEPI Dep	
min	-57,216	-62,141
max	247,891	246,567
avg	9,528	9,555

Year	EEPI Obligation Calculations						EEPI Delivery (AF/yr)	EEPI Departure (AF/yr)
	Current Year Rio Grande at Caballo (AF/yr)	Prior Year Rio Grande at Caballo (AF/yr)	Net Rio Grande at El Paso (AF/yr)	Regression Net Rio Grande at El Paso (AF/yr)	Regression Residual (AF/yr)	EEPI Obligation (AF/yr)		
1989	736,865	838,011	362,800	357,455	5,344	396,539	404,785	8,246
1990	680,106	736,865	328,672	323,852	4,820	362,936	365,399	2,463
1991	625,956	680,106	308,967	291,106	17,862	330,190	346,141	15,951
1992	734,981	625,956	409,661	337,940	71,721	377,024	446,101	69,077
1993	823,244	734,981	438,161	377,035	61,127	416,119	476,966	60,847
1994	893,383	823,244	411,793	383,273	28,521	422,357	455,418	33,061
1995	1,096,145	893,383	472,153	383,273	88,880	422,357	518,583	96,227
1996	774,335	1,096,145	379,425	375,661	3,764	414,745	425,326	10,580
1997	798,621	774,335	409,898	381,497	28,401	420,581	453,645	33,064
1998	808,661	798,621	388,713	383,273	5,441	422,357	434,192	11,836
1999	735,467	808,661	381,956	356,776	25,180	395,860	424,657	28,797
2000	751,373	735,467	361,569	358,321	3,248	397,405	405,947	8,542
2001	786,559	751,373	387,941	377,221	10,720	416,305	427,731	11,426
2002	801,147	786,559	390,915	382,883	8,032	421,967	429,142	7,175
2003	364,528	801,147	145,382	176,542	-31,160	215,626	183,024	-32,602
2004	399,520	364,528	158,804	145,303	13,501	184,387	194,910	10,523
2005	676,031	399,520	270,731	283,623	-12,892	322,707	305,785	-16,922
2006	434,228	676,031	230,979	197,486	33,493	236,570	268,421	31,851
2007	636,730	434,228	286,289	268,463	17,826	307,547	321,073	13,526
2008	675,356	636,730	312,944	310,191	2,753	349,275	349,372	98
2009	693,667	675,356	323,441	323,467	-27	362,551	360,897	-1,654
2010	659,246	693,667	300,841	308,819	-7,977	347,903	336,458	-11,445
2011	396,843	659,246	204,670	177,418	27,252	216,502	242,396	25,894
2012	371,515	396,843	109,874	135,360	-25,486	174,444	145,889	-28,555
2013	168,639	371,515	53,687	33,913	19,774	72,997	92,303	19,306
2014	306,050	168,639	87,348	77,677	9,671	116,761	123,658	6,897
2015	434,855	306,050	137,047	155,842	-18,795	194,926	171,298	-23,628
2016	545,476	434,855	182,189	224,195	-42,005	263,279	215,530	-47,749
2017	623,080	545,476	217,228	274,444	-57,216	313,528	251,387	-62,141
2018	491,560	623,080	222,908	219,339	3,569	258,423	257,711	-712
2019	453,971	491,560	137,327	186,163	-48,836	225,247	172,533	-52,714
2020	593,110	453,971	243,975	249,507	-5,532	288,591	282,797	-5,794
2021	229,892	593,110	91,473	88,800	2,673	127,884	133,161	5,276

A	B	C	D	E	F	G	H	I
Year	EEPI Obligation Calculations						EEPI Delivery (AF/yr)	EEPI Departure (AF/yr)
	Current Year Rio Grande at Caballo (AF/yr)	Prior Year Rio Grande at Caballo (AF/yr)	Net Rio Grande at El Paso (AF/yr)	Regression Net Rio Grande at El Paso (AF/yr)	Regression Residual (AF/yr)	EEPI Obligation (AF/yr)		
1951	469,455	719,339	218,926	219,513	-586	258,597	250,162	-8,435
1952	543,979	469,455	231,870	227,390	4,480	266,474	262,830	-3,645
1953	528,620	543,979	223,717	228,377	-4,660	267,461	255,539	-11,922
1954	244,155	528,620	83,576	88,418	-4,842	127,502	112,336	-15,167
1955	219,156	244,155	58,604	44,019	14,585	83,103	86,776	3,673
1956	246,139	219,156	49,591	54,295	-4,703	93,379	84,461	-8,917
1957	397,092	246,139	107,829	130,700	-22,871	169,784	143,677	-26,107
1958	737,127	397,092	307,539	313,034	-5,495	352,118	343,379	-8,739
1959	687,409	737,127	315,463	327,430	-11,968	366,514	354,340	-12,175
1960	705,161	687,409	311,261	330,419	-19,158	369,503	350,845	-18,658
1961	561,695	705,161	245,285	262,723	-17,439	301,807	284,237	-17,571
1962	651,940	561,695	302,771	290,306	12,465	329,390	343,387	13,998
1963	517,169	651,940	221,197	235,055	-13,858	274,139	263,136	-11,002
1964	206,081	517,169	57,652	68,620	-10,968	107,704	102,136	-5,568
1965	505,606	206,081	164,455	178,883	-14,429	217,967	209,536	-8,432
1966	610,330	505,606	247,347	263,728	-16,381	302,812	289,663	-13,149
1967	456,585	610,330	198,670	200,899	-2,230	239,983	238,423	-1,560
1968	505,673	456,585	221,458	207,319	14,139	246,403	261,080	14,677
1969	667,658	505,673	298,709	291,591	7,118	330,675	338,402	7,727
1970	661,118	667,658	295,836	306,780	-10,944	345,864	337,190	-8,674
1971	498,375	661,118	209,172	226,963	-17,791	266,047	251,881	-14,166
1972	260,902	498,375	117,498	93,126	24,372	132,210	160,657	28,447
1973	617,462	260,902	238,670	239,448	-778	278,532	280,068	1,536
1974	640,852	617,462	316,757	291,241	25,516	330,325	356,558	26,233
1975	580,607	640,852	295,543	264,621	30,922	303,705	336,282	32,577
1976	679,684	580,607	341,575	305,930	35,645	345,014	384,665	39,651
1977	417,495	679,684	189,738	189,770	-32	228,854	235,971	7,117
1978	356,169	417,495	140,135	130,245	9,890	169,329	187,594	18,265
1979	568,687	356,169	243,131	226,551	16,580	265,635	288,074	22,439
1980	658,694	568,687	293,270	294,380	-1,110	333,464	337,288	3,824
1981	608,163	658,694	271,721	280,033	-8,311	319,117	313,677	-5,440
1982	643,169	608,163	266,761	291,312	-24,551	330,396	309,424	-20,972
1983	648,380	643,169	271,332	297,813	-26,481	336,897	312,521	-24,377
1984	653,151	648,380	297,675	300,723	-3,047	339,807	336,591	-3,216
1985	677,397	653,151	298,102	Spill Year				
1986	1,396,165	677,397	618,396	Spill Year				
1987	1,376,100	1,396,165	569,565	Spill Year				
1988	838,011	1,376,100	443,819	Spill Year				

Intercept	-90149.4
X Variable 1 (Column B)	0.485886
X Variable 2 (Column C)	0.113382
Avg D2 TX Mesilla Ag Depletions	26860
Avg D2 TX Mesilla DCMI Depletions	12224
Sum of All Constants	-51065.4

Net RGEP F EEPI Dep		
min	-57,216	-62,141
max	71,721	69,077
avg	885	632

Year	EEPI Obligation Calculations						EEPI Delivery (AF/yr)	EEPI Departure (AF/yr)
	Current Year Rio Grande at Caballo (AF/yr)	Prior Year Rio Grande at Caballo (AF/yr)	Net Rio Grande at El Paso (AF/yr)	Regression Net Rio Grande at El Paso (AF/yr)	Regression Residual (AF/yr)	EEPI Obligation (AF/yr)		
1989	736,865	838,011	362,800	357,455	5,344	396,539	404,785	8,246
1990	680,106	736,865	328,672	323,852	4,820	362,936	365,399	2,463
1991	625,956	680,106	308,967	291,106	17,862	330,190	346,141	15,951
1992	734,981	625,956	409,661	337,940	71,721	377,024	446,101	69,077
1993	823,244	734,981	438,161	377,035	61,127	416,119	476,966	60,847
1994	893,383	823,244	411,793	Spill Year				
1995	1,096,145	893,383	472,153	Spill Year				
1996	774,335	1,096,145	379,425	Spill Year				
1997	798,621	774,335	409,898	381,497	28,401	420,581	453,645	33,064
1998	808,661	798,621	388,713	383,273	5,441	422,357	434,192	11,836
1999	735,467	808,661	381,956	356,776	25,180	395,860	424,657	28,797
2000	751,373	735,467	361,569	358,321	3,248	397,405	405,947	8,542
2001	786,559	751,373	387,941	377,221	10,720	416,305	427,731	11,426
2002	801,147	786,559	390,915	382,883	8,032	421,967	429,142	7,175
2003	364,528	801,147	145,382	176,542	-31,160	215,626	183,024	-32,602
2004	399,520	364,528	158,804	145,303	13,501	184,387	194,910	10,523
2005	676,031	399,520	270,731	283,623	-12,892	322,707	305,785	-16,922
2006	434,228	676,031	230,979	197,486	33,493	236,570	268,421	31,851
2007	636,730	434,228	286,289	268,463	17,826	307,547	321,073	13,526
2008	675,356	636,730	312,944	310,191	2,753	349,275	349,372	98
2009	693,667	675,356	323,441	323,467	-27	362,551	360,897	-1,654
2010	659,246	693,667	300,841	308,819	-7,977	347,903	336,458	-11,445
2011	396,843	659,246	204,670	177,418	27,252	216,502	242,396	25,894
2012	371,515	396,843	109,874	135,360	-25,486	174,444	145,889	-28,555
2013	168,639	371,515	53,687	Extreme Dry Year				
2014	306,050	168,639	87,348	77,677	9,671	116,761	123,658	6,897
2015	434,855	306,050	137,047	155,842	-18,795	194,926	171,298	-23,628
2016	545,476	434,855	182,189	224,195	-42,005	263,279	215,530	-47,749
2017	623,080	545,476	217,228	274,444	-57,216	313,528	251,387	-62,141
2018	491,560	623,080	222,908	219,339	3,569	258,423	257,711	-712
2019	453,971	491,560	137,327	186,163	-48,836	225,247	172,533	-52,714
2020	593,110	453,971	243,975	249,507	-5,532	288,591	282,797	-5,794
2021	229,892	593,110	91,473	88,800	2,673	127,884	133,161	5,276

Year	Current Year Rio Grande at Caballo (AF/yr)	Prior Year Rio Grande at Caballo (AF/yr)	D2 Data Total Heading Diversions (AF/yr)	One-Year Regression D2 Estimate (AF/yr)	Two-Year Regression D2 Estimate (AF/yr)	One-Year Regression Residuals (AF/yr)	Two-Year Regression Residuals (AF/yr)
1951	469,450	719,339	574,230	538,060	592,679	-36,170	18,449
1952	543,975	469,450	622,320	637,759	621,428	15,439	-892
1953	528,628	543,975	601,969	617,228	621,392	15,259	19,423
1954	244,165	528,628	285,762	236,674	264,431	-49,088	-21,331
1955	219,157	244,165	177,939	203,218	160,831	25,279	-17,108
1956	246,140	219,157	186,272	239,316	187,940	53,044	1,668
1957	397,103	246,140	332,319	441,274	382,183	108,955	49,864
1958	737,125	397,103	821,762	896,155	842,691	74,393	20,929
1959	687,414	737,125	841,358	829,652	867,730	-11,706	26,372
1960	705,162	687,414	852,181	853,395	877,077	1,214	24,896
1961	561,697	705,162	688,184	661,468	703,550	-26,716	15,366
1962	651,941	561,697	830,758	782,196	778,955	-48,562	-51,803
1963	517,172	651,941	687,348	601,902	634,715	-85,446	-52,633
1964	206,085	517,172	236,589	185,730	214,248	-50,859	-22,341
1965	505,598	206,085	479,788	586,419	506,618	106,631	26,830
1966	610,341	505,598	694,612	726,544	713,016	31,932	18,404
1967	456,517	610,341	532,866	520,758	548,824	-12,108	15,958
1968	505,691	456,517	579,555	586,543	570,615	6,988	-8,940
1969	667,669	505,691	802,427	803,237	784,189	810	-18,238
1970	661,125	667,669	803,162	794,483	817,386	-8,679	14,224
1971	498,375	661,125	591,757	576,756	613,728	-15,001	21,971
1972	260,911	498,375	295,695	259,077	277,498	-36,618	-18,197
1973	617,461	260,911	706,177	736,069	659,436	29,892	-46,741
1974	640,843	617,461	764,594	767,349	779,407	2,755	14,813
1975	580,617	640,843	753,661	686,779	710,625	-66,882	-43,036
1976	679,676	580,617	868,341	819,300	818,203	-49,041	-50,138
1977	416,496	679,676	493,063	467,218	516,841	-25,845	23,778
1978	356,167	416,496	336,381	386,510	374,833	50,129	38,452

EXHIBIT 5

DECLARATION OF SCOTT A.
MILTENBERGER, PH.D., IN SUPPORT OF
THE JOINT MOTION OF THE STATE OF
TEXAS, STATE OF NEW MEXICO, AND
STATE OF COLORADO TO ENTER
COMPACT DECREE SUPPORTING THE RIO
GRANDE COMPACT
(WITH ATTACHMENT A)

No. 141, Original

In the

SUPREME COURT OF THE UNITED STATES

STATE OF TEXAS,

Plaintiff,

v.

STATE OF NEW MEXICO and
STATE OF COLORADO,

Defendants.

OFFICE OF THE SPECIAL MASTER

**DECLARATION OF SCOTT A. MILTENBERGER, PH.D.,
IN SUPPORT OF THE JOINT MOTION OF THE STATE OF
TEXAS, STATE OF NEW MEXICO, AND STATE OF COLORADO
TO ENTER COMPACT DECREE SUPPORTING THE RIO
GRANDE COMPACT**

STUART L. SOMACH, ESQ.*
THERESA C. BARFIELD, ESQ.
SARAH A. KLAHN, ESQ.
SOMACH SIMMONS & DUNN, PC
500 Capitol Mall, Suite 1000
Sacramento, CA 95814
Telephone: 916-446-7979
ssomach@somachlaw.com
**Counsel of Record*

August 29, 2025

I, Scott A. Miltenberger, declare as follows:

1.0 Background and Experience

1. My name is Scott A. Miltenberger, Ph.D. I was born on October 19, 1977, in Bethlehem, Pennsylvania. The following matters are within my personal knowledge and, if called as a witness, I can competently testify thereto.

2. I am a principal with JRP Historical Consulting, LLC (JRP), with nearly 20 years of professional experience as a historian of Western land and water use. I have been retained by the State of Texas (Texas) to provide consulting services on historical issues presented in this action. My professional resume is included as Attachment A.

3. My business address is 2850 Spafford Street, Davis, California 95618.

4. My education consists of Artium Baccalaureus degree in History (*summa cum laude*) from Colgate University, Hamilton, New York; a Master of Arts degree in United States History from the University of California, Davis; and a Ph.D. in United States History, with concentrations in environmental, urban, and cultural history, from the University of California, Davis. I was the recipient of several academic fellowships and

grants in graduate school, including a Jacob K. Javits Fellowship, awarded to applicants of superior academic ability.

5. Since completing my doctoral work in 2006, I have been employed by JRP. I became a partner in the firm in 2017, and a principal in 2020.

6. Through the date of this Declaration, I have worked (or I am continuing to work) on 78 consulting projects concerning historical water development and use in the states of Arizona, California, Colorado, Idaho, New Mexico, Nevada, Oregon, Texas, and Utah.

7. I have testified as an expert witness on 10 occasions, including previously in this action.

8. My direct experience with the issues before the Court began in 2012 when Somach Simmons & Dunn, on behalf of Texas, engaged JRP to undertake historical research and analysis of the Rio Grande Compact of 1938 (Compact). This work entailed detailed examination of historical documents produced by Texas, the states of New Mexico (New Mexico) and Colorado (Colorado), and federal authorities.

9. I, my former business partner (now retired) Mr. Stephen Wee, M.A., and JRP staff under my direction (all of whom possess graduate degrees in history) visited 26 private, state, and federal libraries, archives,

and records repositories throughout the United States to locate and collect relevant material. These included:

- The National Archives in Washington, DC;
- The National Archives at College Park, Maryland;
- The National Archives at Denver, Colorado;
- The National Archives at Fort Worth, Texas;
- The Dolph Briscoe Center for American History at the University of Texas at Austin;
- The Texas State Archives in Austin;
- The C.L. Sonnichsen Special Collections Department of the University of Texas at El Paso;
- The El Paso Historical Society;
- The New Mexico State Records Center and Archives in Santa Fe;
- The University of New Mexico Center for Southwest Research and Special Collections in Albuquerque;
- The New Mexico State University Archives and Special Collections in Las Cruces;
- History Colorado (formerly the Colorado Historical Society) in Denver;

- The Water Resource Archives at Colorado State University, Fort Collins;
- The American Heritage Center at the University of Wyoming in Laramie;
- The Water Resources Collections and Archives at the University of California, Riverside; and
- The Harvard Law School Library, Historical and Special Collections, in Cambridge, Massachusetts.

10. I also examined documents produced in this litigation by Texas, New Mexico, Colorado, and the United States, respectively, as well as individual expert reports submitted in this action by New Mexico and the United States.

11. I further reviewed the *First Interim Report of the Special Master* and the historical documents appended to that report prior to my testimony in this matter in October 2021. I have since read the *Second Interim Report of the Special Master* and the *Third Interim Report of the Special Master*.

12. Based on my examination of the compiled historical record, I authored an expert report, dated May 31, 2019¹; a rebuttal/supplemental

¹ Trial Ex. TX-0008, Expert Report of Scott A. Miltenberger, Ph.D., JRP Historical Consulting, LLC (May 31, 2019) [5/31/2019 Miltenberger Report].

expert report, dated December 30, 2019²; and two declarations in support of Texas's motions for partial summary judgment, dated November 2, 2020,³ and December 22, 2020,⁴ respectively.

13. I was deposed twice, first on October 2, 2019, and then on June 8, 2020, regarding my expert reports.

14. I testified before the Special Master, the Honorable Judge Michael Melloy, on October 18 and 19, 2021 trial.⁵

2.0 Purpose

15. This Declaration explains how and why the Compact came to be and highlights the challenge that groundwater development came to pose to Compact administration in the mid-to-late 20th century. This Declaration thus furnishes a context not only for this litigation but also for the proposed

² Trial Ex. TX-0029, Expert Rebuttal / Supplemental Report of Scott A. Miltenberger, Ph.D., JRP Historical Consulting, LLC (Dec. 30, 2019) [12/30/2019 Miltenberger Rebuttal/Suppl. Report].

³ Trial Ex. TX-0601, Declaration of Scott A. Miltenberger, Ph.D. in Support of the State of Texas's Motion for Partial Summary Judgment; Memorandum of Points and Authorities in Support Thereof Federal Rule of Civil Procedure 56 (Nov. 2, 2020) [11/2/2020 Miltenberger Decl. ISO MSJ].

⁴ Trial Ex. TX-0606, Declaration of Scott A. Miltenberger, Ph.D. in Support of the State of Texas's Oppositions to the State of New Mexico's Motions for Partial Summary Judgment and Briefs in Support, (Dec. 22, 2020).

⁵ Volume VIII, Transcript of Proceedings, October 18, 2021 (hereinafter "10/18/2021 Vol. VIII Trial Tr."); and Volume IX, Transcript of Proceedings, October 19, 2021 (hereinafter "10/19/2021 Vol. IX Trial Tr.").

Compact Decree. The statements herein are my opinions, derived from my review and analysis of collected and produced historical documents (several of which were admitted as trial exhibits and are cited below), expressed in my expert reports and previous declarations and provided as testimony in this original action (all cited below, as appropriate).

3.0 Conflicts Over Upstream Depletions in the Upper Rio Grande Basin

16. Conflicts over upstream depletions in the Upper Rio Grande Basin form the essential historical background to the Compact and have been an enduring theme in the history of the basin.⁶ Water users in Mexico near Juarez, in New Mexico's Mesilla Valley, and in Texas's El Paso Valley began complaining in the 1890s that diversions within Colorado's San Luis Valley, near the Rio Grande headwaters, diminished river flows reaching their lands. In response to Mexican protests, the federal government imposed an "embargo" (or moratorium) on the use of federal land for reservoirs and other water facilities in 1896.⁷

⁶ 10/18/2021 Vol. III Trial Tr. 53:2-12.

⁷ D.B. Francis, Secretary, to The Commissioner of the General Land Office, December 5, 1896. ff. RG48 E-631 Rio Grande Project, Contract, Suspension of Applications for use of water of the Rio Grande, Box No. 41 Rio Grande, Rouge Canyon, Sacramento Valley, Saint Mary's River, Salt River, Entry 631 Records Relating to Specific Reclamation Projects 1889-1907, Records of the Department of the Interior, Office of the Secretary, Record Group 48 [hereafter RG 48], National Archives at College

17. The embargo subsequently facilitated an international treaty with Mexico in 1906 as well as development of the federal Rio Grande Reclamation Project (Project) in New Mexico and Texas that provided a physical solution to the problem of upstream depletion.⁸ The essential component of the Project was a storage reservoir at Elephant Butte, New Mexico, recommended by the United States Reclamation Service (predecessor to the present-day Bureau of Reclamation, or Reclamation) to capture Rio Grande flows for use on downstream lands.⁹ Congress authorized the Project in 1905, extending the provisions of 1902 National Reclamation Act.¹⁰

18. For the Project, Reclamation filed notices in 1906 and 1908 with the New Mexico Territorial Engineer under New Mexico territorial law for

Park, Maryland [hereafter NARA II]. Trial Ex. TX-0720; and National Resources Committee, *Regional Planning Part VI – The Rio Grande Joint Investigation in the Upper Rio Grande Basin in Colorado, New Mexico, and Texas 1936-1937*, vol. 1 (GPO, 1938) [hereafter *JIR*] 8. Trial Ex. CO-0004.

⁸ Trial Ex. TX-0008, Expert Report of Scott A. Miltenberger, Ph.D. (May 31, 2019), Opinion I, 3, 7-9; Trial Ex. TX-0601 [11/2/2020 Decl. Miltenberger] 5 ¶ 6.

⁹ *Second Annual Report of the Reclamation Service*, H.R. Doc. No. 58-44, at 375-80 (1904).

¹⁰ *An Act Relating to the construction of a dam and reservoir on the Rio Grande, in New Mexico, for the impounding of the flood waters of said river for purposes of irrigation* (Feb. 26, 1905), chap. 798, Public No. 104, 33 Stat. 814. See Trial Ex. TX-0731. Trial Ex. CO-0004 [*JIR*] 8.

Rio Grande water, consistent with Section 8 of the Reclamation Act. The 1906 notice was for 730,000 acre-feet (af) annually, and the 1908 notice was “[a]ll of the unappropriated water of the Rio Grande and its tributaries” at Elephant Butte in 1908.¹¹ By 1919, construction of Elephant Butte Reservoir, including Elephant Butte Dam and the major diversion works of the Project, were complete.¹²

19. Water from Elephant Butte Dam (located near San Marcial, New Mexico) would serve Mexico by the terms of the 1906 treaty (by delivering 60,000 af annually) and would irrigate approximately 88,000 acres of lands in southern New Mexico and approximately 67,000 acres in western Texas by federal contract.¹³ Despite agitation by Colorado, federal authorities

¹¹ B.M. Hall, Supervising Engineer to Mr. David L. White, Territorial Irrigation Engineer, Jan. 23, 1906. ff. 41 New Mexico, Water Appropriations- -General, Thru 1910, Box 6 38C- -41; and Supervising Engineer [Louis C. Hill] to Mr. Vernon L. Sullivan, Territorial Engineer, Subject: Supplemental notice of the intention of the United States to use the waters of the Rio Grande for irrigation purposes on the Rio Grande Project, April 14, 1908. ff. 41-D New Mexico. Water Appropriations. RIO GRANDE PROJECT THRU 1910, Box 9 41B- -41D, Entry 3, Record Group 115 Records of the Bureau of Reclamation [hereafter RG 115], National Archives at Denver [hereafter NARA Denver]. Trial Ex. TX-0513.

¹² *Project History Rio Grande Project Year 1919*, 8th Cir Doc. 418 3, NM EX-0312 at NM-20100, NM-20127-128

¹³ *Convention Between the United States and Mexico Providing for the Equitable Distribution of the Waters of the Rio Grande for Irrigation Purposes*, May 21, 1906, 34 Stat. 2953; and Trial Ex. CO-0004 [JIR] 83-84.

retained the embargo with little modification into the 1920s to protect the waters intended for Elephant Butte from upstream depletions.¹⁴

20. New Mexico and Texas authorized irrigators in the Project area to organize as irrigation districts—Elephant Butte Irrigation District (EBID) in New Mexico, and El Paso County Water Improvement District No. 1 (EPCWID) in Texas (collectively, “Districts”)—to contract with Reclamation for water in exchange for taking on repayment obligations for Project construction costs.¹⁵

4.0 The Temporary Rio Grande Compact of 1929

21. To obtain relief from the embargo, Colorado sought to conclude an interstate compact solely with New Mexico in the early 1920s. Texas—concerned that upstream depletions would increase with a Colorado-New Mexico compact—pushed for inclusion in the negotiations. The two upstream states acquiesced.¹⁶ Revocation of the embargo in 1925 and

¹⁴ Ottamar Hamele, “The Embargo on the Upper Rio Grande,” November 11, 1924, 13-15, and 20-30. 8-3 Rio Grande Distribution of Waters (Loose File), Box 1638 8-3, Rio Grande C-D, Central Classified File 1907-1936 [hereafter “CCF 1907-36”], RG 48, NARA II. Trial Ex. TX-0668; Trial Ex. CO-0004 [*JIR*] 8.

¹⁵ Elephant Butte Water Users’ Association, Articles of Incorporation, 8th Cir. Doc. 418-2, NM EX-0302; El Paso Valley Water Users’ Association, Articles of Incorporation, 8th Cir. Doc. 418-3, NM EX-0304.

¹⁶ First Meeting, Rio Grande River Compact Commission, Breadmoor Hotel, Colorado Springs, Colo., Sunday, October 26, 1924, 1-37. Folder 1. First Meeting Rio Grande Compact Commission. Oct. 26, 1924, Box 02-D.002,

federal approval of new right-of-way applications in Colorado later prompted New Mexico to withdraw from these negotiations.¹⁷

22. The three states did not meet again until December 1928. At that conference, Colorado argued that construction of a Colorado-New Mexico state line reservoir would not impair flows to New Mexico and Texas and would only make use of waters otherwise wasted in the basin or lost to Mexico. Colorado maintained that the downstream states in fact stood to benefit from augmented flows into Elephant Butte created by upstream storage.

23. New Mexico and Texas, however, feared that Colorado's plans threatened planned and existing developments downstream. New Mexico, interested in supporting the fledgling Middle Rio Grande Conservancy

MS 0235 Elephant Butte Irrigation District Records, 1883-1981, Rio Grande Historical Collections, New Mexico State University Archives and Special Collections, Las Cruces. Trial Ex. TX-0730.

¹⁷ Hubert Work to The Commissioner of the General Land Office, Rio Grande Embargo, May 20, 1925. ff. 032.02 Rio Grande Basin Water Rights; Rio Grande River Basin Embargo. THRU 1925 Transfer Case, Box No. 924 Rio Grande Basin 023.- -032.02, Entry 7, Project Files, 1919-1929, General Administrative and Project Records, 1919-1945 [hereafter Entry 7], RG 115, NARA Denver. Trial Ex. TX-0715; J.O. Seth, Rio Grande Commissioner for New Mexico, to Hon. A.T. Hannett, Governor of New Mexico, June 1, 1925. ff. Gov. Arthur T. Hannett Rio Grande Compact Commission, 1925, 209, Box 5, Serial No. 14153, Governor Arthur T. Hannett report, penal papers, New Mexico State Records Center and Archives, Santa Fe [hereafter NMSA]. Trial Ex. TX-0716.

District (MRGCD) project above San Marcial, insisted that a quantity of water for delivery at the Colorado-New Mexico state line be fixed. Texas was protective of the Project's water supply which it maintained served lands down to Ft. Quitman.¹⁸

24. The resulting temporary compact of February 1929 reflected the impasse among the states over the question of whether proposed upstream development would deplete flows for downstream uses. The 1929 compact thus provided for construction of a Closed Basin drain and a "State line reservoir" by the federal government (Article II)—but neither Colorado at the state line (Article V) nor New Mexico at Elephant Butte (Article XII) was to "cause or suffer the water supply" of the river "to be impaired by new or increased diversions or storage" during the duration of the compact, which was set to expire in June 1935. The compact also established several stream-gaging stations in the Upper Rio Grande Basin to gather flow data (Article III), at such locations as San Marcial and Elephant Butte Dam in

¹⁸ Proceedings of the Rio Grande Compact Conference, Held December 19-20-21, 1928, at Santa Fe, New Mexico, 3, 10-11, and 13-19. ff. Rio Grande Compact Commission Records, 1924-1941, 1970, Richard F. Burges Papers, Proceedings of the Rio Grande Compact Conference Held Dec. 19-20-21 at Santa Fe, N.M. (Title page, 78 pp.), Box 2F471, Rio Grande Compact Commission Records, 1924-1941, 1970 [hereafter RGCCR, 1924-1941, 1970], Dolph Briscoe Center for American History, The University of Texas at Austin [hereafter UTA]. Trial Ex. TX-0671.

New Mexico. Regardless of whether the Closed Basin drain and State line reservoir were completed, the states agreed to consummate “a Compact . . . providing for the equitable apportionment of the use of the waters of the Rio Grande among said States” by June 1935 (Article VII).¹⁹

25. The states made little progress when negotiations for a permanent compact resumed in December 1934, however.²⁰ Colorado made a detailed presentation in January 1935, arguing once more that reservoir construction in the San Luis Valley would not deplete downstream flows. Although New Mexico and Texas remained unconvinced, the states agreed

¹⁹ Francis C. Wilson, Rio Grande Compact Commissioner, *Rio Grande Compact: Report of Commissioner for New Mexico and Memorandum of Law on Interstate Compacts on Interstate Streams* 2/19/29, 4 (Article II), 5-6 (Article III), 6 (Article V), 7 (Article VII), and 9 (Article XII), and 11-21. ff. 032.1, Rio Grande Basin. Water Rights: Rio Grande Compact. THRU 1929, Box 924 Rio Grande Basin 023.- -032.02, Entry 7, RG 115, NARA Denver. Trial Ex. TX-0654.

²⁰ Proceedings of the Rio Grande Compact Conference held at Santa Fe, New Mexico, December 10-11, 1934, 1-38. ff. Proceedings of the Rio Grande Compact Commission, Santa Fe, New Mexico. 1934-1935, Box 62, Series 7: Publications and reports, 1856-1992 and undated [hereafter Series 7], Subseries 7.1: Compacts and rivers, 1893-1986 and undated [hereafter Series 7.1], Papers of Delph E. Carpenter and Family [hereafter PDECF], Water Resources Archives [hereafter WRA], Colorado State University, Fort Collins [hereafter CSU-FC]. Trial Ex. TX-0686; and S.O. Harper to Secretary of the Interior, December 14, 1934. File No. 8-3 (Part 2), Rio Grande-Distribution of Waters-Compact, C-D, August 18, 1930-February 25, 1936, Box 1638, CCF 1907-1936, RG 48, NARA II. Trial Ex. TX-0656.

to a two-year extension of the temporary compact (until June 1937) to consider Colorado's proposal in detail.²¹

5.0 *Texas v. New Mexico and the Middle Rio Grande Conservancy District*

26. Before the two-year extension period concluded, Texas filed a complaint against New Mexico and MRGCD in the United States Supreme Court in October 1935. The downstream state alleged that the district's operations above Elephant Butte were impairing the water supply to its lands below in violation of the 1929 compact.²²

27. Following extensive hearings, citing the current investigation by the federal National Resources Committee (NRC) and at the request by counsel representing Texas, New Mexico, and MRGCD, Special Master Charles Warren recommended postponement of the case until January 1938, to give the states an opportunity to conclude a compact. The Supreme Court

²¹ Trial Ex. TX-0008 [5/31/2019 Miltenberger Report]. Opinion I, at 14-15; Trial Ex. TX-0601 [11/2/2020 Miltenberger Decl. ISO MSJ] 8 ¶ 10.

²² The State of Texas, By Wm. McCraw, Its Attorney General, H. Grady Chandler, Assistant Attorney General, Richard F. Burges, Walter S. Howe, Edwin Mechem, Of Counsel, Supreme Court of the United States, October Term, 1935, No. – Original, *State of Texas, Complainant, vs. State of New Mexico, et al.*, Motion for Leave to File Bill of Complaint and Bill of Complaint [October 29, 1935]. w. Texas' Briefs, A.G. 51-238, *State of Texas v. State of New Mexico, et al.*, Box 1993/127-1, Litigation Files, Texas Attorney General [hereafter LF-TAG], Texas State Archives, Austin [hereafter TSA]. Trial Ex. TX-0675.

approved his recommendation, and adoption of the Compact in March 1938 brought an end to the original action.²³

6.0 The Board of Review

28. The investigation referenced by Warren was a direct outgrowth of the stalemate over the question of permissible upstream depletions. The NRC was a special working group within the Franklin D. Roosevelt administration that aimed to foster planned development of the nation's natural resources. In September 1935, a month prior to Texas's filing in the Supreme Court, the group appointed a "Board of Review" (Board) "to consider various projects and problems related to the use and control of waters" in the Upper Rio Grande Basin.²⁴

29. Surveying the problems posed by increased water consumption above existing projects, the Board concluded that "the water resources of the Rio Grande were fully appropriated." The most established uses of the Rio Grande flow, reflecting the basin's history, emanated from the waters stored in Elephant Butte for the Rio Grande Project and to satisfy the 1906 Mexican treaty obligation. The Board expressed concern that proposed

²³ Trial Ex. TX-0008 [5/31/2019 Miltenberger Report], Opinion I, 18; Trial Ex. TX-0601 [11/2/2020 Miltenberger Decl. ISO MSJ] 8 ¶ 11.

²⁴ Trial Ex. CO-0004 [*JIR*] 10.

and existing upstream projects in New Mexico above San Marcial (notably, MRGCD's) and in Colorado's San Luis Valley imperiled this supply.²⁵

30. Absent importation of water from outside the basin, the Board believed "adjustments in use rather than new uses" were required.²⁶ It therefore recommended certain projects already approved by certain agencies be disapproved and that no future projects for the basin's waters proceed without the NRC's prior approval. A September 1935 executive order adopted this recommendation, effectively reinstating the embargo.²⁷

31. Of greater importance to the ultimate Compact, the Board also proposed a joint federal-state investigation to develop the information that

²⁵ "Report of the Rio Grande Board of Review," September 13, 1935, 1, and 3-8. Folder 390-Rio Grande Joint Investigation Purpose and Organization, 1935-1937 [hereafter Folder 390], Box 26, Frank Adams Collection [hereafter FAC], Water Resources Collections and Archives, University of California, Riverside [hereafter WRCA]. Trial Ex. TX-0653.

²⁶ "Report of the Rio Grande Board of Review," September 13, 1935, 1. Folder 390, Box 26, FAC, WRCA. Trial Ex. TX-0653.

²⁷ "Report of the Rio Grande Board of Review," September 13, 1935, 8. Folder 390, Box 26, FAC, WRCA. Trial Ex. TX-0653; Franklin D. Roosevelt, To Federal agencies concerned with projects or allotments for water use in the Upper Rio Grande Valley above El Paso, September 23, 1935. File No. 8-3 (Pt. 7). Reclamation Bureau - Rio Grande Project - Rio Grande River - Distribution of Waters – General, February 6, 1933 to December 12, 1956, Box 1642, 8-3, Rio Grande, R, Riverton, CCF 1907-1936, RG 48, NARA II. Trial Ex. TX-0658.

would assist the states in framing a permanent compact.²⁸ The Rio Grande Compact Commission, consisting of representatives from each of the three states, chaired by a federal representative embraced this idea when presented in December 1935—provided that the investigation would be limited to the “collection, correlation and presentation of factual data.”²⁹

7.0 *The Rio Grande Joint Investigation and the Technical Basis of the Compact*

32. Available in the late summer of 1937 and published in February 1938, *The Rio Grande Joint Investigation in the Upper Rio Grande Basin in Colorado, New Mexico, and Texas, 1936-1937* report (*JIR*), compiled a considerable amount of “factual data.” Laying out the water resources problem of the Upper Rio Grande Basin, the *JIR* offered detailed analyses of hydrology, hydrogeology, irrigation development and irrigated acreage, and water uses and requirements for the basin’s three major sections defined by geography and history: Colorado’s San Luis Valley, New Mexico’s Middle Rio Grande Valley above San Marcial, and the lands between Elephant Butte and Ft. Quitman (the end of the Upper Rio Grande Basin). This

²⁸ “Report of the Rio Grande Board of Review,” September 13, 1935, 10. Folder 390, Box 26, FAC, WRCA. Trial Ex. TX-0653.

²⁹ “Resolution Passed by Rio Grande Compact Commission at Santa Fe, New Mexico,” December 3, 1935, 1-2. Folder 401-Rio Grande Compact Commission Resolutions, 1935-1937, Box 26, FAC, WRCA. Trial Ex. TX-0663.

information was explicitly intended to assist Colorado, New Mexico, and Texas in apportioning the Rio Grande waters to meet present and future needs in these sections.³⁰

33. Using data from the *JIR*, the Rio Grande Compact Commission’s engineering advisors—Royce Tipton for Colorado, John Bliss for New Mexico, Raymond Hill for Texas, and E.B. Debler for the United States—developed the “technical basis” for the Compact’s apportionment.³¹ In formulating that basis in the fall of 1937, the engineering advisors “avoided discussion of the relative rights of waters users in the three States,” and did not assign each state a fixed quantity of water.³² They concurred

³⁰ Proceedings of the Meeting of the Rio Grande Compact Commission Held in Santa Fe, New Mexico, September 27, to October 1, 1937, 1, 6-8. Unnamed folder 5, Box 2F463, Rio Grande Compact Comm’n. Frank B. Clayton Papers [hereafter RGCC-FBCP], UTA. Trial Ex. TX-0665; Trial Ex. CO-0004 [*JIR*] 7-18 and *passim*.

³¹ R.J. Tipton, *Analysis of Report of Committee of Engineers to Rio Grande Compact Commissioner, Dated December 27, 1937* (February, 1938), 1. ff. 70, Box 44-70, MSS 312 Michael Creed Hinderlinder Collection, 1897-1987 [hereafter MCHC 1897-1987], History Colorado, Denver [hereafter HC]. Trial Ex. TX-0689; “Rio Grande Compact,” in Proceedings of the Meeting of the Rio Grande Compact Commission Held at Santa Fe, March 3rd to March 18th, inc., 1938, Appendix No. 11, 72-82. ff. 032.1 Rio Grande Basin, Corres. re Compact between States of Colorado; New Mexico & Texas re Rio Grande Basin Water Rights Jan. 1938 thru May 1939, Box No. 936 Rio Grande Basin 023. 246., Entry 7, RG 115, NARA Denver. Trial Exs. TX-0615 and TX-0628.

³² “Report of Committee of Engineers to Rio Grande Compact Commissioners,” December 27, 1937, in Proceedings of the Meeting of the Rio Grande Compact Commission . . . New Mexico, March 3rd to

with the Board and the *JIR* that only water from outside the basin could address all on-going and then-planned water uses in the basin fully. The engineers also did not consider the development of groundwater as an additional source of supply.³³

34. The group focused on distributing the known available water supply to meet existing demands. This was intended, in Tipton's words, "to permit not only present uses of water, but also to allow increased diversion and consumption of water above Elephant Butte Reservoir by utilizing water which otherwise would spill from that reservoir." The only way Tipton and his fellow advisors found "[t]o accomplish this end" was by developing delivery schedules based on "present conditions" of flow manifesting at the Lobatos gaging station near the Colorado-New Mexico state line (later adopted as Article III of the Compact), and at Elephant Butte Reservoir.³⁴

March 18th, inc., 1938, Appendix No. 1, 47. ff. 032.1, Box No. 936, Entry 7, RG 115, NARA Denver. Trial Exs. TX-0615 and TX-0628.

³³ Raymond A. Hill, Memo to Mr. Clayton: In re Meeting of Committee of Engineers, at Santa Fe, November 22 to 24, 1937, (Nov. 26, 1937), 3. [1937], Box 2F467, RGCC-FBCP, UTA. Trial Ex. TX-0674; and "Report of Committee of Engineers to Rio Grande Compact Commissioners," December 27, 1937, in Proceedings of the Meeting of the Rio Grande Compact Commission . . . March 3rd to March 18th, inc., 1938, Appendix No. 1, 47. ff. 032.1, Box No. 936, Entry 7, RG 115, NARA Denver. Trial Exs. TX-0615 and TX-0628.

³⁴ Tipton, *Analysis*, 5-6. ff. 70, Box 44-70, MCHC 1897-1987, HC. Trial Ex. TX-0689; and "Rio Grande Compact," Article III and Article IV, in Proceedings of the Meeting of the Rio Grande Compact Commission

35. These delivery points were effectively the same points that the 1929 compact had used to restrict depletions. The schedules, in Tipton's words, "would insure each section of the basin against injury by acts of water uses in another section and yet would permit of the construction and operation of additional reservoirs above Elephant Butte Reservoir."³⁵

36. "Present conditions" and "present uses," ca. 1938, thus structured the "equitable apportionment" of the waters of the Rio Grande among the states of Colorado, New Mexico, and Texas.³⁶ What constituted "present conditions" varied for each upstream section but was based on stream flow data and analyses presented in the *JIR*. For Colorado's delivery to New Mexico (later adopted as Article III of the Compact) those "present conditions" were reflected in the waters reaching the Lobatos gage near the state line for "the period 1928 to 1937."³⁷ The *JIR* identified a stability in

. . . March 3rd to March 18th, inc., 1938, Appendix No. 11, 74-78. ff. 032.1, Box No. 936, Entry 7, RG 115, NARA Denver. Trial Exs. TX-0615 and TX-0628.

³⁵ Tipton, *Analysis*, 4. ff. 70, Box 44-70, MCHC 1897-1987, HC. Trial Ex. TX-0689.

³⁶ This is elucidated in further detail in Scott Miltenberger's Expert Rebuttal / Supplemental Report, Trial Ex. TX-0029 [12/30/2019 Miltenberger Rebuttal/Suppl. Report], Suppl. Opinion I, 31-54; and Trial Ex. TX-0601 [11/2/2020 Miltenberger Decl. ISO MSJ] 12-17 ¶¶ 20-28; *see also* 10/18/2021 Vol. VIII Trial Tr. 189:24-25:190:1-191:15.

³⁷ Tipton, *Analysis*, 6. ff. 70, Box 44-70, MCHC 1897-1987, HC. Trial Ex. TX-0689.

consumptive water use in the San Luis Valley for much of this period, and Tipton was convinced that a state line delivery schedule on this basis would not hamper Colorado's proposed developments in the valley upstream of New Mexico and Texas.³⁸

37. For New Mexico's ultimate delivery schedule to Texas (later adopted as Article IV of the Compact), those "present conditions" were reflected in the waters reaching San Marcial for "the period prior to 1930."³⁹ The engineering advisors had considered a schedule based on a relationship between the Otowi Bridge and San Marcial gages in New Mexico for the period roughly between 1912 and 1935, based on information presented in the *JIR*. However, they came to conclude that a relationship between Otowi Bridge discharge and Elephant Butte inflow (excluding the months of July, August, and September) for a 1915-1937 time frame was a more accurate measure of "present conditions."⁴⁰

³⁸ Trial Ex. CO-0004 [JIR] 29-30; and Tipton, *Analysis*, 5. ff. 70, Box 44-70, MCHC 1897-1987, HC. Trial Ex. TX-0689.

³⁹ "Letter from Committee of Engineering Advisers," March 9, 1938, in Proceedings of the Meeting of the Rio Grande Compact Commission . . . March 3rd to March 18th, inc., 1938, Appendix No. 7, 61-62; and "Rio Grande Compact," Article IV, in Proceedings of the Meeting of the Rio Grande Compact Commission . . . March 3rd to March 18th, inc., 1938, Appendix No. 11, 76-78. ff. 032.1, Box No. 936, Entry 7, RG 115, NARA Denver. Trial Exs. TX-0615 and TX-0628.

⁴⁰ Preliminary Draft of Report of Committee to Rio Grande Compact Commissioners, December 22, 1937, 5. CB-F-137-34, Box 4X215, RAHP,

38. Criticisms of the proposed Otowi Bridge-Elephant Butte schedule by MRGCD's consulting engineer H.C. Neuffer prompted New Mexico's compact commissioner Thomas McClure to oppose use of the schedule. At the prodding of the compact commissioners, the engineering advisors in March 1938 returned to an Otowi Bridge-San Marcial index (excluding the months of July, August, and September) "for the period prior to 1930."⁴¹ According to McClure and Bliss, this different time scale

UTA. Trial Ex. TX-0697; Tipton, *Analysis*, 6. ff. 70, Box 44-70, MCHC 1897-1987, HC. Trial Ex. TX-0689; and "Report of Committee of Engineers to Rio Grande Compact Commissioners," December 27, 1937, in *Proceedings of the Meeting of the Rio Grande Compact Commission . . . March 3rd to March 18th, inc., 1938*, Appendix No. 1, 42-43. ff. 032.1, Box No. 936, Entry 7, RG 115, NARA Denver. Trial Exs. TX-0615 and TX-0628.

⁴¹ H.C. Neuffer, Memorandum, Subject: Report of Committee of Engineers to Rio Grande Compact Commissioners, December 27, 1937, January 6, 1938, np [1-2]. NM_00156900–NM_00156901 and NM_00156905. Trial Ex. TX-0710; [H.C. Neuffer] to Mr. Thomas M. McClure, State Engineer, January 13, 1938; Thomas M. McClure, State Engineer, to Mr. S.O. Harper, Chairman, Rio Grande Compact Commission, January 25th, 1938; and "Letter from Committee of Engineering Advisers," March 9, 1938, in *Proceedings of the Meeting of the Rio Grande Compact Commission . . . March 3rd to March 18th, inc., 1938*, Appendix No. 7, 61. ff. 032.1, Box No. 936, Entry 7, RG 115, NARA Denver. Trial Ex. TX-0615 and TX-0628.

In February 1948, the Rio Grande Compact Commission adopted a resolution that, in pertinent part, changed the delivery point from the San Marcial gaging station to the Elephant Butte gaging station. "Minutes of the Ninth Annual (Nineteenth) Meeting of the Rio Grande Commission Held in El Paso, Texas," February 22, 23, 24, 1948, 5-8. ff. Opinions of Attorney Generals concerning switch of Gaging Stations, w. Factual Research, *State*

avoided the effect of MRGCD on downstream Rio Grande flows since 1929.⁴²

39. A system of credits and debits, later adopted as Article VI of the Compact, strictly addressed the potential for increased upstream depletions and were ultimately contingent on downstream uses being met.⁴³ Colorado, pursuant to this credits-and-debits system, was permitted to pursue post-1937 reservoir construction.⁴⁴

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of Texas vs. State of New Mexico, et al, AG No. 51-238, Box 1991/17-188, LF-TAG, TSA. Trial Ex. TX-0717.

⁴² J.H. Bliss, Engineer, “Provisions of the Rio Grande Compact,” Santa Fe, N.M., April 2, 1938, 1. ff. Rio Grande Compact Engineer-Adviser Data, 1937-1938, Box No. 27, Accession Number 7978, John H. Bliss Collection [JHBC], American Heritage Center, University of Wyoming, Laramie [hereafter AHC]. Trial Ex. TX-0618; and Thomas B. McClure, State Engineer, “Analysis of the Compact,” undated, 21. Trial Ex. TX-0711 at NM_00164500.

⁴³ “Rio Grande Compact,” Article VI, in Proceedings of the Meeting of the Rio Grande Compact Commission . . . March 3rd to March 18th, inc., 1938, Appendix No. 11, 78-79. ff. 032.1, Box No. 936, Entry 7, RG 115, NARA Denver. Trial Exs. TX-0615 and TX-0628.

⁴⁴ “Rio Grande Compact,” Article III, in Proceedings of the Meeting of the Rio Grande Compact Commission . . . March 3rd to March 18th, inc., 1938, Appendix No. 11, at 74-76 and 78-79. ff. 032.1, Box No. 936, Entry 7, RG 115, NARA Denver. Trial Exs. TX-0615 and TX-0628.

40. New Mexico similarly could depart from its delivery schedule. The state could hold water in “reservoirs constructed after 1929” pursuant to the Article VI credits-and-debits system.⁴⁵

41. Yet, in accordance with Article VIII, New Mexico could call upon Colorado to release the water in its reservoirs to satisfy the upstream state’s accrued debits, and Texas could call upon both upstream states to release water from “reservoirs constructed after 1929” to satisfy accrued debits.⁴⁶ Correspondingly those debits were forgiven when “actual spill” from Elephant Butte occurred.⁴⁷

42. The Compact further provided for an average or “normal release of 790,000 acre-feet” from Rio Grande Project storage (Article VIII).⁴⁸ This

⁴⁵ “Rio Grande Compact,” Article VI, in Proceedings of the Meeting of the Rio Grande Compact Commission . . . March 3rd to March 18th, inc., 1938, Appendix No. 11, at 74-76. ff. 032.1, Box No. 936, Entry 7, RG 115, NARA Denver. Trial Exs. TX-0615 and TX-0628.

⁴⁶ “Rio Grande Compact,” Article VIII, in Proceedings of the Meeting of the Rio Grande Compact Commission . . . March 3rd to March 18th, inc., 1938, Appendix No. 11, 80. ff. 032.1, Box No. 936, Entry 7, RG 115, NARA Denver. Trial Exs. TX-0615 and TX-0628.

⁴⁷ “Rio Grande Compact,” Article I and Article VI, in Proceedings of the Meeting of the Rio Grande Compact Commission . . . March 3rd to March 18th, inc., 1938, Appendix No. 11, at 73 and 78-79. ff. 032.1, Box No. 936, Entry 7, RG 115, NARA Denver. Trial Exs. TX-0615 and TX-0628.

⁴⁸ “Rio Grande Compact,” Article IV, Article VII, Article VIII, in Proceedings of the Meeting of the Rio Grande Compact Commission . . . March 3rd to March 18th, inc., 1938, Appendix No. 11, at 77-78 and

was water, as later explained by Hill, intended for the 1906 Mexican treaty obligation (60,000 af) and for “uses in the United States” (730,000 af).⁴⁹

43. No provision for a state-line delivery was made for Texas in the Compact, owing to the historical development of the Project. Although the Districts contracted for the water appropriated for the Project, federal reclamation authorities operated the Project “as an administrative unit,” in the words of Texas’s compact commissioner Frank Clayton.⁵⁰ Project

79-80. ff. 032.1, Box No. 936, Entry 7, RG 115, NARA Denver. Trial Exs. TX-0615 and TX-0628.

⁴⁹ In the Supreme Court of the United States, October Term 1967, No. 29, Original, *State of Texas and New Mexico v. State of Colorado*, Deposition of: Raymond A. Hill, Taken December 4, 1968, Denver, Colorado, 18. ff. *Texas and New Mexico v. Colorado*, w. *Texas v. Colorado* 66-1061, Box 1989 41-240, LF-TAG, TSA. Trial Exs. TX-0623 and TX-0625.

⁵⁰ Frank B. Clayton, Rio Grande Compact Commissioner for Texas, to Mr. Sawnie B. Smith, October 4, 1938, 1. Box 2F466, RGCC-FBCP, UTA. Trial Exs. TX-619 and TX-0624.

See also Thomas B. McClure, State Engineer, “Analysis of the Compact,” undated, 21-22. Trial Ex. TX-0711 at NM_00164500-501; and Bliss, “Provisions of the Rio Grande Compact,” 1. ff. Rio Grande Compact Engineer-Adviser Data, 1937-1938, Box No. 27, Accession Number 7978, JHBC, AHC. Trial Ex. TX-0618.

A third public district, located in Texas outside the Project, Hudspeth County Conservation and Reclamation District No. 1, held a separate Warren Act contract that entitled it to water that passed out of the Project (mostly drainage water) when available. *See* Trial Ex. TX-0008 [5/31/2019 Miltenberger Report], Opinion IV, 88.

infrastructure was built largely without regard to state boundaries, and diversions to serve lands in Texas were made within New Mexico.⁵¹

44. Texas contemplated asking for a state-line delivery in the 1930s, but decided against it because of the Project.⁵² As far back as the 1929 temporary compact, New Mexico and Texas acknowledged that “New Mexico’s obligations . . . must be with reference to deliveries at Elephant Butte reservoir [i.e., San Marcial],” as Clayton explained to attorney Sawnie Smith in October 1938.⁵³ Federal control of the dam and Project works spanning across New Mexico and Texas, anticipated to continue in the future, defeated any effort to establish obligations for the upstream states for a specific quantity of water to Texas in 1938.⁵⁴ “[N]either Colorado nor New Mexico,” the Texas commissioner stressed, “could be expected to

⁵¹ Clayton to Smith, October 4, 1938, 1. Box 2F466. Trial Exs. TX-0619 and TX-0624; and *Proceedings of Meeting Held on Friday, May 27, 1938 at El Paso, Texas, between Representative of Lower Rio Grande Water Users and Representatives of Irrigation Districts Under the Rio Grande Project of the Bureau of Reclamation*, 15. ff. Proceedings and Minutes 1935-1938, Box 2F463, RGCC-FBCP, UTA. Trial Ex. TX-0678.

⁵² Raymond A. Hill to Mr. Frank B. Clayton, February 8, 1938. Box 2F466. Trial Exs. NM-1474, TX-0614, and TX-0626; and *Proceedings of Meeting Held on Friday, May 27, 1938*, 10 and 11. ff. Proceedings and Minutes 1935-1938, Box 2F463, RGCC-FBCP, UTA. Trial Ex. TX-0678.

⁵³ Clayton to Smith, October 4, 1938, 1. Box 2F466, RGCC-FBCP, UTA. Trial Exs. TX-0619 and TX-0624.

⁵⁴ *Id.*

guarantee any fixed deliveries at the Texas line” owing to those circumstances.⁵⁵ San Marcial was thus the *de facto* state line delivery to Texas.⁵⁶

45. Although the Compact permitted Colorado and New Mexico to pursue other irrigation developments while protecting the Project, it did not explicitly limit water use to irrigation. Any use of the apportioned waters was permissible, as Hill testified when deposed in an original action Texas and New Mexico filed against Colorado in the 1960s: “subject only to the maintenance of depletions that had occurred, subject only to not increasing those overall depletions, there is a freedom in each State to store, develop, improve or do anything else within that State.”⁵⁷

8.0 Upstream Depletions and Groundwater Development, Post-Compact

46. As Hill’s deposition testimony suggests, depletions continued to be a source of conflict within the Upper Rio Grande Basin despite the

⁵⁵ *Id.*; see also Frank B. Clayton, Rio Grande Compact Commissioner for Texas, to Hon. Homer L. Leonard, August 3, 1938, 2. Box 2F466, RGCC-FBCP, UTA. Trial Ex. TX-0645.

⁵⁶ *Proceedings of Meeting Held on Friday, May 27, 1938*, 10, 11, and 15. ff. *Proceedings and Minutes 1935-1938*, Box 2F463, RGCC-FBCP, UTA. Trial Ex. TX-0678.

⁵⁷ Deposition of Raymond A. Hill. Taken December 4, 1968, 36., ff. *Texas and New Mex. v. Colorado.*, w. 66-1061 *Texas v. Colorado*, Box 1989 41-240, LF-TAG, TSA. Trial Exs. TX-0623 and TX-0625.

Compact. In 1951, Texas revived its suit against New Mexico and MRGCD, alleging once again that district operations were diminishing flows that should reach Elephant Butte (and thereby to Texas through the Project) pursuant to the Compact.⁵⁸ In 1966, Texas and New Mexico together filed suit in the Supreme Court against Colorado, alleging that the upstream state was failing to adhere to its Compact delivery obligations and was depleting water for downstream uses.⁵⁹

47. These disputes, which never ripened into litigation as the present action has,⁶⁰ focused on surface water. Groundwater pumping, by contrast, became a more significant source of upstream depletions in the late 20th century and fostered the conditions for this original action.

⁵⁸ In the Supreme Court of the United States, October Term, 1951, No., Original, *State of Texas v. State of New Mexico, et al., Motion for Leave to File Complaint and Complaint*, 2-3, and 10-14. No. 9. *Orig – State of Texas v. State of New Mexico, et al.*, Filed April 28, 1952, 6-24-58. ff. RG 267 Entry 26 TX v. NM #9, Box 459 1957 (Begin TX v. MN #9) to 1957, Entry 26, RG 267, NAB. Trial Ex. TX-0718.

⁵⁹ In the Supreme Court of the United States, October Term, 1966, No., Original, *State of Texas and State of New Mexico v. The State of Colorado Motion for Leave to File Complaint and Complaint*, 2-3, and 5-7. Trial Ex. TX-0724.

⁶⁰ The 1951 suit was eventually dismissed because of the absence of the United States as indispensable party, and the 1966 suit was ultimately settled by the states out of court. Trial Ex. TX-0601 [11/2/2020 Miltenberger Decl. ISO MSJ] 11-12, ¶ 19.

48. Groundwater was used on Project lands prior to the Compact. The Board, the *JIR*, and the Rio Grande Compact engineering advisors (as noted above), however, did not consider groundwater as a source of augmentation for the basin's water supply, ca. 1938.⁶¹

49. Drought in the late 1940s and early 1950s led to an expansion of pumping to compensate for shortages of Project surface water deliveries, inclusive of drainage and return flows from irrigation. As the effects of the drought abated in the late 1950s, Project water users shifted away from groundwater pumping but did not abandon use of subsurface water entirely.⁶²

50. Hydrological studies in the 1950s and 1960s documented an interconnection between Rio Grande streamflow and subsurface waters

⁶¹ See, for example, Trial Ex. CO-0004 [*JIR*] 56.

⁶² United States, Department of the Interior, Bureau of Reclamation, Rio Grande Project – New Mexico-Texas, River Loss, Caballo Dam to El Paso and Irrigation Wells, El Paso, Texas, July 1, 1952, Summary, Part I, A. Trial Ex. TX-0707; Narendra Gunaji, Ground Water Conditions in Elephant Butte Irrigation District (University Park, New Mexico: Engineering Experiment Station, New Mexico State University, November 1961), 5. Trial Ex. TX-0610; and E.R. Leggat, M.E. Lowry, and J.W. Hood, *Ground-Water Resources of the Lower Mesilla Valley, Texas and New Mexico*, U.S. Geological Survey Water Supply Paper 1669-AA (GPO, 1963), AA18-AA19 and AA24. Trial Ex. TX-0726.

previously indicated in earlier 20th century investigations.⁶³ The new studies suggested that groundwater could supplement surface water during drought periods. It also warned of the hazards should groundwater extraction expand, intercepting drainage and return flows necessary for downstream lands and degrading water quality overall.⁶⁴

51. By the early 1980s, there is historical evidence that “extensive groundwater development,” initiated in the early 1950s in response to drought, ushered in a long-term trend that impacted the Rio Grande streamflow regime and Project deliveries between Elephant Butte Dam and El Paso, Texas. This alteration required that greater amounts of water be released to ensure a sufficient quantity and quality of water reached the end of the Project and lands in Texas.⁶⁵

⁶³ Trial Ex. TX-0029 [12/30/2019 Miltenberger Rebuttal/Suppl. Report] Rebuttal Opinion I, 2-11.

⁶⁴ Gunaji, Ground Water Conditions in Elephant Butte Irrigation District, 15, 27, and 36-37. Trial Ex. TX-0610; and Leggat, et al., *Ground-Water Resources of the Lower Mesilla Valley*, AA25, AA45, and AA48. Trial Ex. TX-0726.

⁶⁵ [Office of the New Mexico State Engineer,] Rio Grande, Elephant Butte Dam to El Paso, Texas [1982], 1. Folder 11 Correspondence and data concerning Mesilla Valley pumping. 1982., Box 1, MS 555 Joseph F. Friedkin Papers, C.L. Sonnichsen Special Collections Department, University of Texas at El Paso. Trial Ex. TX-0702.

9.0 Summation

52. Central to the history of the Compact was the effort to safeguard downstream uses or existing downstream developments while providing for future upstream depletions of the Rio Grande. The engineers responsible for crafting the “technical basis” of the Compact in 1938 endeavored to balance these competing demands for water. They did this through delivery schedules keyed to specific time scales that reflected “present conditions” of streamflow and respected “present uses” of water predicated on those conditions. Since the mid-20th century, groundwater development has altered those conditions.

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Executed this 26th day of 2025, at Davis, California.



Scott A. Miltenberger, Ph.D.

ATTACHMENT A

Scott A. Miltenberger, Ph.D.
Principal · Historian



Summary

Dr. Miltenberger is a professional consulting historian, specializing in environmental and natural resources issues. Since joining JRP in 2006, he has researched historical land and water use in California and elsewhere in the American West. Dr. Miltenberger has also led historical investigations of survey / boundary disputes, potentially responsible parties for toxic clean-up under the provisions of CERCLA, river meanders, levee construction and performance, and flood management operations. His clients have included local, state, and federal agencies, as well as private parties. Dr. Miltenberger has qualified as an expert historian and given expert witness testimony before the California State Water Resources Control Board; in Orange County Superior Court; in Sacramento County Superior Court; in Santa Barbara Superior Court; in Santa Clara County Superior Court; in Sonoma County Superior Court; in Maricopa County (Arizona) Superior Court; in United States District Court, Northern District of California and Eastern District of California (Fresno Division); and in a United States Supreme Court original action.

Selected Professional Experience

Expert Witness Work, Deposition, and Trial / Hearing Testimony

Five Point Holdings, LLC, et al., Plaintiffs, v. United States of America, Defendant, Case No. 3:20-cv-01480-JD; *Five Point Holdings, LLC, et al., Plaintiffs, v. Tetra Tech, Inc, et al., Defendants*, Case No. 3:20-cv-01481-JD; and *CPHP Development, LLC, et al., Plaintiffs, v. Tetra Tech, Inc., et al., Defendants*, Case No. 3:20-cv-01485-JD, United States District Court, Northern District of California. Prepared expert historian report (based on federal archival and library research and produced records) concerning the history of the development of the former San Francisco Naval Shipyard at Hunters Point and the presence of radiological material at the former US Navy (Navy) facility through the end of the 20th century, in anticipation of expert witness testimony for Five Point Holdings, LLC, CPHP Development, LLC, and Lennar. Los Angeles and San Francisco: Alston & Bird LLP, and O'Melveny & Myers LLP, 2025-Present.

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Education

Ph.D., United States History,
University of California, Davis,
2006
M.A. United States History,
University of California, Davis,
2001
A.B. History, *summa cum laude*,
Colgate University, New York,
1999

**Academic Honors,
Fellowships, and Grants**

Agricultural History Center
Dissertation Grant, University of
California, Davis, 2005-2006
Reed-Smith Dissertation-Year
Fellowship, University of
California, Davis, 2004-2005
Legacy Fellowship, American
Antiquarian Society, 2004
Distinction, Ph. D. Comprehensive
Examinations, University of
California, Davis, December
2001
Jacob K. Javits Graduate Fellowship,
United States Department of
Education, 2000-2004
Reed-Smith Incoming Graduate
Student Fellowship, University
of California, Davis, 1999.
Charles A. Dana Fellowship, Colgate
University, 1997-1999
Alumni Memorial Scholarship,
Colgate University, 1995-1999
Phi Beta Kappa, Colgate University,
September 1998 (inducted)
Phi Alpha Theta, Colgate University,
September 1997 (inducted)

Professional Affiliations

American Historical Association
(Pacific Coast Branch)
American Society for Environmental
History
National Council on Public History
(Consultants' Committee)

Mojave Pistachios, LLC, et al., Plaintiffs, v. Indian Wells Valley Water District; et al., Defendants, Case No. 30-2021-01187275-CU-OR-CJC, Superior Court of the State of California, For the County of Orange, Civil Complex Center. Prepared expert historian report (based on research in federal, state, and local records in California, College Park, MD, and Washington, DC) and provided expert witness testimony for the United States Navy, Naval Air Weapons Station, China Lake, California concerning the history of the installation, its mission, population, and groundwater use for the purposes of a federal reserved water right claim. Washington, DC and Denver, CO: United States Department of Justice, 2021-Present.

State of Texas v. State of New Mexico and State of Colorado, No. 141, Original, Supreme Court of the United States. Prepared expert historian reports and declarations (based on extensive archival and library research in California, Colorado, Massachusetts, New Mexico, Texas, Washington, DC, and Wyoming), and provided expert witness deposition and trial testimony for the State of Texas concerning the development of the Rio Grande Compact of 1938. Sacramento, CA: Somach Simmons & Dunn, 2012-Present.

United States of America, Plaintiff, v. 331.46 Acres of Land, More or Less, Situated in Madera County, State of California, et al, Defendants, Case No. 1:23-CV-00735-NODJ-BAM, United States District Court, Eastern District of California, Fresno Division. Provided expert declaration of salient findings from historical research and analysis of the origins of Columbia Canal, the early history of Columbia Canal Company, and the relationship of the mutual water company to its shareholder, in support of Columbia Canal Company's opposition to the United States' Motion for Judgment. Sacramento: Downey Brand, LLP, 2024-Present.

William Tourady, Ginger Tourady, Kelly Jenette, Carol J. Groves as Trustee of the Groves Family Trust, Plaintiffs, vs. Katherine Kemerait, et al., Defendants, Case No. SCV-265679, Superior Court of the State of California, County of Sonoma. Provided expert witness testimony for Katherine Kemerait evaluating historical evidence presented by plaintiffs of California riparian, prescriptive, and pre-1914 water rights. Petaluma, CA: Law Office of Peter Kiel, 2022.

Las Posas Valley Water Rights Coalition, et al., Plaintiffs, vs. Fox Canyon Groundwater Management Agency, et al, Defendants, Case No. VENC100509700, Superior Court of the State of California, County of Santa Barbara. Prepared expert historian report (based on library and archival research and review of corporate records) and provided expert deposition and trial testimony for Las Posas Valley Water Rights Coalition on the history of Del Norte Water Company and the historical relationship between the Company and its shareholders with regard to the development, distribution, and use of Las Posas Valley Groundwater Basin groundwater. Sacramento, CA: Downey Brand, LLP, 2021-2022.

In the Matter of Applications of North Kern Water Storage District and City of Shafter (Application 31673), City of Bakersfield (Application 31674), Buena Vista Water Storage District (Application 31675), Kern Water Bank Authority (Application 31676), Kern County Water Agency (Application 31677), and Rosedale-Rio Bravo Water Storage District (Application 31819), Phase 1B Hearing, California State Water Resources Control Board, Administrative Hearings Office. Provided expert witness testimony for the Kern Water Bank Authority regarding historical land and water use within present-day Buena Vista Water Storage District as well as the "Lower River Rights." Sacramento, CA: Downey Brand, LLP, 2018-2022.

The Vineyard House, LLC, Plaintiff, vs. Constellation Brands U.S. Operations, Inc., Defendant, Case No. 4:19-cv-1424-YGR, United States District Court, Northern District of California – Oakland. Prepared expert historian report (based on county records, and archival and library research), and provided expert witness deposition and trial testimony for The Vineyard House, LLC, regarding the name “To Kalon,” its historical association with a specific geographic place within the Oakville, California area, and the influence of H.W. Crabb, the original owner of To Kalon. San Francisco, CA: Buchalter, APC, 2019-2020.

Matt Pear and Mark Pear, Plaintiffs, vs. City and County of San Francisco, a municipal corporation, Does, 1-50, inclusive, Case No. 112CV227801, Superior Court of the State of California, County of Santa Clara. Provided expert witness testimony (based on research in federal, state, county, and municipal [San Francisco] records) for the City and County of San Francisco concerning historical land use and urban / suburban / industrial development of Santa Clara County in the 1950s as related to the Hetch Hetchy Aqueduct Right of Way. City and County of San Francisco, CA: City Attorney’s Office, San Francisco Public Utilities Commission, 2017.

Modesto Irrigation District vs. Heather Robinson Tanaka, et al. Case No. 34-2011-00112886, Superior Court of the State of California, County of Sacramento. Provided expert witness deposition and trial testimony (based on research in state and county records) for Modesto Irrigation District concerning the riparian status of a parcel in San Joaquin County and historical land and water uses on that parcel. Sacramento, CA: O’Laughlin & Paris LLP, 2014-2015.

In Re the General Adjudication of All Rights to Use Water in the Gila River System and Source. Civil Nos. W-1, W-2, W-3, and W-4, Contested Case No. W-1-11-605, Maricopa County Superior Court, State of Arizona. Prepared expert historian report (based on extensive archival and library research in Arizona, California, Colorado, and Washington, DC), and provided expert witness deposition and trial testimony for the United States Army and Fort Huachuca, Arizona concerning the history of the fort, its changing missions, population, and water use, for the purposes of a federal reserved water right claim. Washington, DC and Denver, CO: United States Department of Justice, 2012-2016.

Selected Consulting Historian Services Since 2006

Historical Review of Claims to Palouse River. Boise, ID: Natural Resources Division, Office of the Attorney General, State of Idaho, 2025-Present.

Historical Investigation of Colorado River Basin Water Right Claims and Disputes, 2024-Present.

Historical Investigation of San Joaquin River Meanders and Riparian Parcels, 2024-Present.

Historical Investigation of Water Development, Use, and Conservation, Byron-Bethany Irrigation District. Sacramento, CA: Somach, Simmons and Dunn, 2024-Present.

Historical Investigation of Groundwater Development in Oxnard-Pleasant Valley Area, Ventura County, 2023-Present.

Historical Investigation of Land Use and Water Right Entitlements in the Kings River Basin, 2022-Present.

Historical Investigation of Land Use and Water Right Entitlements in Calaveras County, CA, 2022-Present.

Historical Investigation of Groundwater Development in the Orange County Groundwater Basin, Orange County, CA, 2022-Present.

Historical Research and Analysis of “Cultivation,” Agricultural Practices, and the Origins of California Water Code Section 1004. San Francisco, CA: Duane Morris LLP, 2020-Present.

Historical Investigation of Groundwater Development and Use in the Tulare Lake Basin, Kings and Tulare counties, CA, 2020-Present.

Historical Investigation of Riparian and Pre-1914 Appropriative Water Rights Claims along Bear Creek, Merced County, CA, 2020-Present.

Historical Investigation of Pre-1914 Water Rights for Agricultural Lands within the Fresno River Basin, Madera County, CA, 2020-Present.

Historical Investigation of Riparian and Pre-1914 Appropriative Water Rights for Agricultural Lands in Merced County, CA. San Francisco: Duane Morris LLP, 2019-Present.

Historical Investigation of Riparian and Pre-1914 Appropriative Water Rights for Sacramento-San Joaquin Delta Island Lands, 2016-Present.

Historical Investigation of Possible Water Right Entitlements in the Butte Basin, 2021-2023.

Historical Investigation of Historical Investigation of Riparian Water Rights for Coastal Property in San Mateo County, 2023.

Historical Investigation of Water Right Priorities in Tehama County, CA, 2022-2023.

Historical Investigation of Native American / Federal Reserved Water Rights Claims for Southern California “Mission Indians.” Sacramento, CA: Downey Brand, 2022.

Due Diligence Research of Historical Water Right Entitlements and Easements for a Recreational Property in Monterey County, CA. San Francisco: Duane Morris LLP, 2021-2022.

Historical Investigation of Riparian and Pre-1914 Appropriative Water Rights for Parcels along Merced River, Merced County, CA, 2018-2022.

Historical Investigation of Native American / Federal Reserved Water Rights Claims for Blue Lake Rancheria, Humboldt County, CA, 2017-2018 and 2022-2023.

Historical Research of Levee Construction and Flood Control Efforts along Bear River, Yuba County, CA, 2021.

Historical Research of Easements for the City of Benicia’s Raw Water Transmission Line, Solano County, CA. City of Benicia, 2021.

Riparian Water Rights Investigation of the Cal West-South Meridian Road Property, Sutter County, CA. Marysville, CA: Stromer Realty, 2020.

Clear Lake Littoral Rights Investigations, Lake County, CA. Woodland, CA: Yolo County Flood Control and Water Conservation District, 2019-2021.

Historical Investigation of Water Right Entitlements within the Stanislaus River Basin, Stanislaus County, CA, 2018-2020.

Riparian Water Rights Investigation of Parcels in San Joaquin County, CA, 2018-2019.

Historical Research of California Public Utilities Records, 2018.

Historical Research of Military Operations at McClellan United States Air Force Base, Sacramento, CA, concerning use of chromium and chromium products, 2018.

Historical Investigation of Water Rights Entitlements for James Irrigation District, Fresno County, CA. Sacramento, CA: Bartkiewicz Kronick & Shanahan, 2017-2021.

Historical Investigation of Riparian and Pre-1914 Appropriative Water Rights for an Agricultural Parcel in Merced County, CA. San Francisco: Duane Morris LLP, 2017-2019.

Historical Research of Water Rights for a Parcel in Stanislaus County, CA. Sacramento, CA: O’Laughlin & Paris, LLP, 2017-2018.

Historical Research of Water Rights acquired by the City of Santa Cruz, CA. Santa Cruz, CA: Atchison, Barisone, Condotti & Kovacevich, 2016-2017.

Historical Research of Reclamation District Assessments in Colusa County. Sacramento, CA: Somach Simmons & Dunn, 2016.

Historical Research of Shipbuilding Operations at the Kaiser Swan Island Shipyards, Port of Portland, Oregon. San Francisco: Bassi, Edlin, Huie and Blum, 2015 and 2019-2021.

Historical Investigation of Dams and Flood Control Operations on the Boise River. Boise, ID: Natural Resources Division, Office of the Attorney General, State of Idaho, 2015-2017.

Historical Research of Pre-1914 Water Rights of Woods Irrigation Company, San Joaquin County, CA. Sacramento, CA: State Water Contractors and San Luis and Delta-Mendota Water Authority, 2015-2016.

Historical Investigation of Riparian Water Rights for Agricultural and Wetlands in the Cosumnes River watershed, Sacramento County, CA. Sacramento, CA: Sacramento County Counsel, 2015-2016.

Historical Investigation of Riparian and Pre-1914 Water Rights for Agricultural Lands in the Salinas River Basin, Monterey County, CA, 2015-2016.

Historical Investigation of Riparian and Pre-1914 Water Rights for Agricultural Lands adjacent to the Sacramento River, Yolo County, CA, 2015-2016.

Historical Research and Analysis of the Construction of Cline Falls Dam and Power Plant on Deschutes River, Oregon. Bend, OR: Holland & Knight, LLP, 2015.

Historical Research of Land Uses and Development West of Hunters Point, San Francisco. San Francisco, CA: Bassi, Edlin, Huie and Blum, 2015.

Historical Investigation of Riparian and Pre-1914 Appropriative Water Right Claims for Three Parcels in Contra County, CA, 2014.

Historical Research of Groundwater Pumping and Litigation in the 1950s among Orange County, Riverside, and San Bernardino area water interests in the Upper Santa Ana River Basin in Southern California. Redlands, CA: Thomas McPeters, Esq., McPeters McAlearney Shimoff & Hatt, 2013-2015.

Gallo Cattle Company v. Lincoln White Crane Hunter Farms; Merced Irrigation District, et. al. Case No. CV00105, Superior Court, State of California, County of Merced. Assisted in the collection of historical documentation in support of an expert witness deposition and planned testimony regarding Crocker Huffman Land and Water Company history, development of its irrigation and drainage system (later acquired by Merced Irrigation District [MID]), and the background of a 1918 agreement to flow water from Merced County Drainage District #1 (later acquired by MID) to a private landowner. Walnut Creek, CA: Miller Starr Regalia; and San Francisco, CA: Duane Morris, LLP, 2013-2014.

Historical Research of Land Use, Union Lumber Company and adjacent properties, Fort Bragg, CA. San Francisco, CA: Bassi, Edlin, Huie and Blum, 2013-2014.

Historical Research of a Pre-1914 Appropriative Water Rights Claim for a Ranch in Merced County, CA, 2013.

Cortopassi Partners v. California Department of Water Resources, et al. Case No. CV034843, Superior Court, State of California, County of San Joaquin. Assisted in the collection of historical documentation in support of an expert witness deposition and planned testimony concerning public and private dredging on the Mokelumne River. Sacramento, CA: California Department of Justice, 2012-2013.

Historical Research of United States Army Corps of Engineers' Dredging and Flood Control Activities on the Yuba River. Sacramento, CA: MBK Engineers, 2012.

Historical Investigation of Reclamation and Land Use of Union Island, San Joaquin Delta, CA. Sacramento, CA: O'Laughlin & Paris LLP for Modesto Irrigation District; Kronick, Moskovitz, Tiedemann & Girard for State Water Contractors; and Diepenbrock Harrison for San Luis and Delta-Mendota Water Authority, 2011-2013.

In Re the General Adjudication of Rights to the Use of Water from the Coeur d'Alene-Spokane River Basin Water System. District Court of the Fifth Judicial District of the State of Idaho, Twin Falls, ID. Assisted in the research, document / data management, and preparation of an expert report regarding Coeur d'Alene tribal water rights claims made in the general adjudication of water rights in the Coeur d'Alene-Spokane River Basin, Idaho. Boise, ID: Natural Resources Division, Office of the Attorney General, State of Idaho, 2010-2020.

Historical Investigation of Reclamation and Land Use of Roberts Island, San Joaquin Delta, CA. Sacramento, CA: O'Laughlin & Paris LLP for Modesto Irrigation District; Kronick, Moskovitz,

Tiedemann & Girard for State Water Contractors; and Diepenbrock Harrison for San Luis and Delta-Mendota Water Authority, 2010-2014.

Historical Investigation of Delineations of the Rialto Groundwater Basin, San Bernardino, CA. Redlands, CA: Thomas McPeters, Esq., McPeters McAlearney Shimoff & Hatt, 2010-2013.

Historical Investigation of Water Development at Two Well Sites in the Chino Groundwater Basin, CA. Rancho Cucamonga, CA: Cucamonga Valley Water District, 2010-2012.

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EXHIBIT 6

DECLARATION OF ELIZABETH K.
ANDERSON, P.E., IN SUPPORT OF JOINT
MOTION OF THE STATE OF TEXAS, STATE
OF NEW MEXICO, AND STATE OF
COLORADO FOR ENTRY OF DECREE
SUPPORTING THE RIO GRANDE COMPACT
(WITH ATTACHMENTS A AND B)

No. 141, Original

In the
SUPREME COURT OF THE UNITED STATES

STATE OF TEXAS,

Plaintiff,

v.

STATE OF NEW MEXICO and STATE OF COLORADO,

Defendants.

OFFICE OF THE SPECIAL MASTER

**DECLARATION OF ELIZABETH K.
ANDERSON, P.E.**

**IN SUPPORT OF JOINT MOTION OF THE STATE OF TEXAS, STATE OF
NEW MEXICO, AND STATE OF COLORADO FOR ENTRY OF DECREE
SUPPORTING THE RIO GRANDE COMPACT**

August 29, 2025

I, Elizabeth Anderson, P.E., pursuant to 28 U.S. C. § 1746, hereby declare as follows:

1. I am over 18 years of age and have personal knowledge of the facts stated herein. I am competent to testify to the matters herein. If called to testify, I can and will testify in accordance with the following.
2. I earned a Bachelor of Science in Civil Engineering and a Master of Science in Environmental Engineering from the University of New Mexico.
3. I have approximately 25 years of experience in water resources and civil engineering. Before serving as State Engineer, I served as Senior Advisor to the State Engineer. I previously served as Chief Planning Officer for the Albuquerque Bernalillo County Water Utility Authority, managing engineering, asset management, and water resources. Prior to that, I worked as an engineering consultant, serving as Operations Leader for Jacob's Engineering water division in New Mexico and West Texas.
4. I am currently the State Engineer for the State of New Mexico. In this position I head the Office of the State Engineer ("OSE") and hold a cabinet position appointed by and reporting to the Governor of the State of New Mexico and confirmed by the state Senate. I have held this position since August 17, 2024.
5. My curriculum vitae is attached to this Declaration as Exhibit A.

Role of the State Engineer and the Interstate Stream Commission

6. The OSE is the executive agency charged with the management and administration of all waters in the state, with a current staff of over 350 authorized personnel including water resource managers, professional engineers, licensed attorneys, hearing officers, legal assistants, water rights professionals/abstractors, hydrologists, water masters, financial/budget analysts, IT professionals, tribal liaison, clerical and other support staff. The OSE consists of four (4) budgeted programs, seven (7) District Offices throughout New Mexico and 20 administrative, technical and legal bureaus that report to the four (4) budgeted programs.

7. As the State Engineer, I am statutorily charged with supervising the state's water resources through the measurement, appropriation, and distribution of all ground and surface water in New Mexico, including streams and rivers that cross state boundaries. State Engineer permission is necessary to make a new appropriation, drill a well, divert surface water and groundwater, or change the place or purpose of use of an existing water right. The Office of the State Engineer acts on water rights applications, evaluates existing water rights, measures and tracks water use and resources, promotes conservation, and performs the scientific, historical, and legal research needed to support all its activities. Additional duties include reviewing subdivision water supply plans submitted by counties, licensing water-well drillers, inspecting non-federal dams, and rehabilitating diversion dams and irrigation ditches. 72-2-1 *et seq.* NMSA 1978.
8. The New Mexico Legislature created the Interstate Stream Commission ("ISC") in 1935 and gave it broad powers to investigate, protect, conserve, and develop the state's water supplies. Its separate duties include protecting New Mexico's right to water under eight (8) interstate stream compacts and ensuring the state complies with each of those compacts, as well as developing and promoting regional and statewide water planning. In my role as the State Engineer, I serve as the Secretary of the ISC. Hannah Riseley-White serves as the Director of the ISC. Her Declaration provides additional information about the agency and its role in Rio Grande Compact ("Compact") compliance.
9. I also stand, *ex officio*, as New Mexico Commissioner on the Rio Grande Compact Commission and the Costilla Creek Compact Commission. In addition to those compacts, I am responsible for New Mexico water administration assuring compliance with the other five compacts to which New Mexico is a signatory: Pecos River Compact, Colorado River Compact, Canadian River Compact, Animas-La Plata Project Compact, and the La Plata River Compact.

New Mexico's System for Water Administration

10. Under the New Mexico Constitution and statutory law, water in New Mexico belongs to the public. The New Mexico Constitution provides that

beneficial use is the basis, the measure, and the limit of a water right, and that priority shall be given the better right. N.M. Const. Art. XVI, §§ 2-3. The New Mexico Constitution further provides for priority administration. Priority administration is an administrative action in which the exercise of water rights is curtailed in order of priority, starting by curtailing the most junior or recently established rights. Priority administration allows senior water rights to obtain water during times of shortage. These key provisions were statutorily implemented through the 1907 Water Code, NMSA 1978 Chapter 72. New Mexico groundwater laws were codified in 1931. NMSA 1978, § 72-12-1, *et seq.*

11. On the local level, the OSE District IV office, situated in Las Cruces, New Mexico, is charged with implementing State Engineer administration in the Lower Rio Grande Basin (“LRG”). District IV conducts the on-the-ground administration, compliance, and enforcement activities of the OSE in the LRG and other basins within the District’s boundary. Those issues that cannot be resolved by District IV are referred to appropriate divisions within the OSE, including the Administrative Litigation Unit (“ALU”).
12. In addition, the Lower Rio Grande Water Master District is administered out of the Las Cruces office. The Lower Rio Grande Water Master is also located in the Las Cruces office. Extensive evidence was provided in the 2021 trial regarding the way in which the LRG Water Master actively enforces groundwater regulations and water management directives, including to ensure compliance with the Compact. *See* Transcript of Proceedings, Vol. XVIII (Nov. 9, 2021), testimony of Ryan Serrano at 19:20-20:9, 22:25-23:20, 34:3-17, 41:25-144:11. Mr. Serrano summarizes the role of the LRG Water Master in his Declaration.
13. It is the exclusive jurisdiction of a state water adjudication court to determine the right to use the waters of New Mexico. NMSA 1978, § 72-4-17. The determination of water rights in the LRG is accomplished through the state district court adjudication entitled *State of New Mexico ex rel. State Engineer v. Elephant Butte Irrigation District et al.*, No. D-307-CV-96-888 (the “LRG Adjudication”). In addition to adjudicating individual water rights, the LRG Adjudication Court determined that there were several overarching issues impacting the LRG which should be addressed separately. These were termed “Stream System Issues” and “Expedited Inter Se Proceedings” and were or will be litigated and tried

apart from the individual water rights claims.

14. In 2003, the New Mexico legislature enacted the Active Water Resource Management statute (“AWRM Statute”), NMSA 1978, §72-2-9.1. The AWRM Statute enabled the State Engineer to promulgate regulations governing priority administration of water rights regardless of the status of a water rights adjudication in a given area. Accordingly, the State Engineer created and promulgated the Active Water Resources Management regulations (“AWRM Framework Rules”) in 2004. 19.25.13 NMAC. The AWRM Framework Rules allow the OSE to supervise the physical distribution of water, prevent waste, and administer the available supply of water by priority date or by alternative administration, as appropriate. These rules apply to all water rights within the state from all sources of water and allow for the adoption of specific rules that could be promulgated separately for individual Water Master Districts. A central provision of the AWRM Framework Rules defines types of priority administration to be used as circumstances dictate, including alternative administration based on water sharing agreements among affected water rights, if those agreements are acceptable to the State Engineer. 19.25.13.7(C)(1)-(4) NMAC. The State Engineer has the authority to impose priority administration whether or not district-specific rules have been adopted and despite any disputes about the relative priority of various groundwater rights.

Overview of the Settlement Package from New Mexico’s Perspective

15. The current settlement involves four separate agreements for New Mexico. From New Mexico’s perspective, each of those agreements fits together as a part of a fair and equitable resolution of the Original Action.
16. The four agreements that New Mexico is entering are the following: (1) the proposed Consent Decree Supporting the Rio Grande Compact (“Compact Decree”), (2) the Operations Settlement Agreement, (3) the Groundwater Settlement Agreement, and (4) the Third-Party Implementing Agreement (collectively the four agreements are referred to as the “Settlement Package”). The Compact Decree is attached to the Compacting States’ Joint Motion to Enter Consent Decree Supporting the Rio Grande Compact; the Operations Settlement Agreement, Groundwater Settlement Agreement, and Third-Party Implementing Agreement are

attached to the Joint Motion of the United States and New Mexico to Dismiss. Each of the agreements in the Settlement Package is important and New Mexico would not have entered into any one of the four agreements without the other three.

17. The four agreements in the Settlement Package complement each other from New Mexico's perspective. The Compact Decree clarifies the amount of water that must reach the Texas-New Mexico border, and by extension, the water New Mexico may use in the Lower Rio Grande; the Operations Settlement Agreement adjusts Project operations including to address New Mexico's claims in the Original Action, ensure New Mexico farmers receive the surface water from the Project to which they are entitled, harmonize Project operations with New Mexico's Compact obligations, and provide tools for New Mexico's Compact compliance; the Groundwater Settlement Agreement provides clear parameters for managing the aquifer to prevent Project interference and meet Compact delivery obligations, and allows New Mexico discretion to develop a plan for water administration in the LRG; and the Third-Party Implementing Contract details the tools provided in the Operations Settlement Agreement and sets pricing should Allocation Transfers be necessary in the future to satisfy the Compact Decree.
18. Together, the Settlement Package provides significant benefits to New Mexico including: (1) providing a mechanism for measuring the equitable apportionment of surface water below Elephant Butte Reservoir between New Mexico and Texas, (2) enabling New Mexico and Texas to receive their full Compact apportionments, (3) providing certainty and stability as between the Compacting States, (4) allowing continued groundwater pumping in New Mexico and Texas at the levels that existed during the D2 Period (1951-1978), subject to safeguards to protect against aquifer storage loss and interference with Project deliveries, (5) providing that each State is responsible for actions and depletions caused by its own water users, (6) harmonizing Project operations and the requirements of the Compact or the Compact Decree, (7) making adjustments to Project operations and accounting that address New Mexico's longstanding concerns, and (8) maintaining New Mexico's discretion to conduct water administration as it deems necessary and appropriate to satisfy its obligations and protect the rights of water users in New Mexico.

The Compact Decree

19. New Mexico would not have entered the Settlement Package if the United States could at any time in the future challenge the Compact Decree as being inconsistent with the Compact. To that end, I understand that the United States does not object to entry of the Compact Decree and has agreed that the Compact Decree is consistent with the Compact.
20. Going forward, compliance with the Compact Decree will “represent[] compliance with the Compact with respect to the division of Rio Grande water below Elephant Butte Reservoir.” Compact Decree at 6, § II.A.7. That is important because it provides certainty to both New Mexico and Texas.
21. To provide clarity as to what comprises Compact compliance in the Lower Rio Grande for New Mexico and Texas, and to assure compliance with the Consent Decree, the Effective El Paso Index (“EEPI”) was developed. The EEPI is based on the hydrologic conditions and water use occurring during the D2 Period (1951-1978). Dr. Barroll discusses the EEPI in her Declaration.
22. In order for New Mexico to receive its full Compact apportionment of surface water through Project Allocations, and meet the EEPI, New Mexico is required to take actions to reduce depletions from aquifers connected to the Lower Rio Grande. New Mexico will also pursue other options to increase the supply of water available for its citizens and for satisfying the Compact Decree below Caballo Dam. I further discuss depletion reduction below in the Groundwater Settlement Agreement section of this Declaration.
23. New Mexico will administer water rights in the Lower Rio Grande to ensure compliance with the Compact and the Compact Decree, including Annual and Accrued Negative Departures.
24. In addition to resolving a long-standing conflict between New Mexico and Texas regarding the Rio Grande, entry of the Compact Decree and implementation of its provisions will facilitate interstate relations between Colorado, New Mexico, and Texas by providing a clear and comprehensive methodology for Compact compliance. I anticipate the

Compact Decree will help the States to avoid future conflicts and will enable effective Compact compliance into the future.

The Operations Settlement Agreement

25. The details of the Operations Settlement Agreement are addressed by Dr. Barroll. I offer a high-level perspective of the Operations Settlement Agreement and address the provisions of the Operations Settlement Agreement related to other cases.
26. At a high-level, and from New Mexico's perspective, the Operations Settlement Agreement accomplishes five goals.
 - a. First, it makes permanent changes to Project operations that address New Mexico's longstanding concerns. Among other improvements, when coupled with locating the measurement point for New Mexico deliveries at the state line as specified in the Compact Decree, changing the charge point for EPCWID to the American Canal Heading makes New Mexico responsible for the actions of its water users, but not the actions of water users in Texas.
 - b. Next, the Operations Settlement Agreement, like the Compact Decree, adopts a D2 baseline. Going forward, Project Allocations must be based on the Modified D2 equation. This recognizes the right of both New Mexico and Texas to continue to rely on groundwater use that is consistent with the D2 Period.
 - c. Third, in the Operations Settlement Agreement, U.S. Bureau of Reclamation ("Reclamation") voluntarily agrees to modify Project operations to harmonize them with the EEPI by tracking the Accrued Departure and facilitating Allocation Transfers from EBID to EPCWID or EPCWID to EBID as necessary to keep Project Allocations and the requirements of the Compact Decree consistent.
 - d. Fourth, the Allocation Transfers provide a tool for New Mexico to comply with its obligations under the Compact and the Compact Decree. Specifically, New Mexico can, in its sole discretion, order an Allocation Transfer from EBID to EPCWID of up to 30,000 acre-feet in any given year. As described in more detail in the Declaration of Mr. Serrano, those Allocation Transfers can take

three forms: (1) Transfers of EBID surface water allotments associated with lands or water rights acquired or leased by New Mexico, (2) Transfers of credit water built up through the Third-Party Implementation Contract, or (3) Transfers of part of EBID's current year Allocation ("Forebearance"). If an Allocation Transfer is made, it immediately reduces the Accrued Departure for purposes of the Compact Decree (and the Operations Settlement Agreement).¹ Thus, the Allocation Transfers provide an important tool for New Mexico to comply with the Compact if there is a Negative Accrued Departure. At the same time, if New Mexico overdelivers water to Texas, as reflected in a Positive Accrued Departure at the end of the year of 50,000 acre-feet, then Allocation Transfers from EPCWID to EBID will bring water back to New Mexico farmers. In this way, the division of water will stay within the accepted limits of the 57/43 Compact apportionment.

- e. Fifth, the Operations Settlement Agreement provides that future Project operations must be consistent with the Operations Settlement Agreement, so the Settlement Package is designed to prevent future disputes.

Resolution of Issues in the LRG Adjudication

- 27. In addition to addressing Project operations, the Operations Settlement Agreement resolves outstanding issues in the LRG Adjudication.
- 28. *Stream System Issue 101* ("SSI 101"): SSI 101 in the LRG Adjudication addresses the consumptive irrigation requirements ("CIR") and farm delivery requirements ("FDR") for all crops in the Lower Rio Grande Basin. A Final Judgement was entered in SSI 101 on August 22, 2011. A copy of the SSI 101 Final Judgment was admitted into the record in this case as Joint Exhibit 474.
 - a. In the Final Judgement, the LRG Adjudication Court determined that 3.024 acre-feet per acre per year was a reasonable FDR for crops in the Lower Rio Grande that are irrigated with surface water only.

¹ The expectation and intention is that the calculation of Annual and Accrued Departures in the Compact Decree and the Operations Settlement Agreement will be the same.

See Joint Exhibit 474 at ¶ 22. This number (3.024 acre-feet per acre per year) is consistent with the amount of water that Reclamation determined was a full supply for Project purposes.

- b. The LRG Adjudication Court further recognized that in years when the Project does not provide an allotment of 3.024 acre-feet per acre, the farmers could use supplemental groundwater to supplement the surface water up to 3.024 acre-feet. The LRG Adjudication Court defined “supplemental” as “providing groundwater in an amount that, when combined with the EBID annual allotment for the irrigated acreage adjudicated as having combined surface water and groundwater rights, does not exceed 3.024 acre-feet per acre per year.” Joint Exhibit 474 at 7, ¶ D. However, the LRG Adjudication Court did not identify a priority date for supplemental groundwater.
29. As part of the Settlement Package, the United States, New Mexico, and EBID agreed to resolve an outstanding dispute regarding the priority date for this supplemental groundwater. The parties will seek to amend the Final Judgment in SSI 101 to recognize a priority date of 1903 for administrable combined surface and groundwater diversions at the farm headgate of up to 3.024 acre-feet per acre per year for EBID members with administrable, combined surface water and supplemental groundwater rights.
30. This agreement will ensure that EBID farmers with combined surface and groundwater rights can use up to 3.024 acre-feet per acre per year of water from either surface or groundwater. The agreement thereby addresses, in part, the United States’ concerns about Project interference, and protects the important agricultural community in the Lower Rio Grande in New Mexico by providing a source of water for irrigation even in dry years.
31. *Stream System Issue 104 / Expedited Inter Se Proceeding* (“SSI 104”): Water rights for Reclamation projects are defined and administered pursuant to state law. Consistent with that principle, one of the Stream System Issues in the LRG Adjudication is SSI 104. This Stream System issue designated “the interests of the United States deriving from the establishment of the Rio Grande Project” for determination in the LRG

Adjudication.² In short, SSI 104 defines the Project right in New Mexico.

- a. By order dated August 16, 2012 the LRG Adjudication Court ruled on summary judgment that the United States had no interests in groundwater. It found that groundwater and surface water are separate sources of water for purposes of appropriation, the United States had not appropriated groundwater for the Project, and that groundwater is not Project water. A copy of the relevant order was admitted into the record in 2021 as Joint Exhibit 472.
 - b. SSI 104 went to trial in summer 2016 on the sole issue of the priority date of Project surface water, all other issues having been resolved through summary judgment. The LRG Adjudication Court entered its Findings of Fact and Conclusions of Law on April 17, 2017 holding the Project has a surface water priority date of March 1, 1903. A copy of the relevant order was admitted into the record in 2021 as Joint Exhibit 473.
 - c. The LRG Adjudication Court entered a final subfile order (which operates as a final judgment) regarding the rights of the United States in the Rio Grande Project on April 8, 2025. A copy of that subfile order is attached to this Declaration as Exhibit B.
32. SSI 104 is currently pending on appeal, though the parties to the appeal have not yet identified the issues they intend to raise through a docketing statement. In Section II.A.2 of the Operations Settlement Agreement, the United States, New Mexico, and EBID agree to a priority date of 1903 for the Project, subject to a final ruling by the New Mexico Court of Appeals. To facilitate that agreement, New Mexico has agreed that it will not pursue an appeal of the priority date for the Project right in the appeal.
 33. With a priority date of March 1, 1903, individual surface water irrigation rights that receive water stored and diverted as part of the United States' Rio Grande Project within EBID, and supplemental groundwater rights

² In 1997 the United States brought suit in New Mexico federal court to quiet title to its Project water rights, including a claim for groundwater. The federal district court stayed the suit in favor of allowing the New Mexico State LRG Adjudication Court to determine the issues. *See United States v. City of Las Cruces*, 289 F.3d 1170 (10th Cir. 2002).

associated with those surface water rights, would be senior to most of the groundwater rights in the Lower Rio Grande. Should there ever be a need for priority administration in the Lower Rio Grande, which is one of the tools the State Engineer can use to assure compliance with the Compact Decree, this relative priority date would be significant.

34. Consistent with Section II.A.2 of the Operations Settlement Agreement, the parties to the SSI 104 appeal may continue to pursue issues unrelated to the Project priority date, including the ruling identified above on groundwater, but New Mexico is hopeful that the entire appeal can be resolved through the good faith negotiations I discuss below.

Resolution of Related Cases

35. The parties to the Operations Settlement Agreement further agreed to dispose of their relative claims in two federal district court cases.
36. In 2011 New Mexico sued the United States in federal district court over issues involving the 2008 Operating Agreement. *State of New Mexico v. United States, et al.*, D.N.M. 11-CV-691 (2011). Among other claims, New Mexico alleged that Reclamation's actions violated the Compact by depriving New Mexico of its equitable share of the Rio Grande. The court stayed this federal litigation pending resolution of the claims in this Original Action, and New Mexico pleaded similar counterclaims in the Original Action. In Section III of the Operations Settlement Agreement, the United States, New Mexico, EBID, and EPCWID mutually agreed to drop any claims in this case.
37. Similarly, as described in footnote 2, above, a federal district court stayed a suit brought by the United States to quiet title to its Project rights pending resolution of the similar issues in the LRG Adjudication. In Section III of the Operations Settlement Agreement, the United States, New Mexico, EBID, and EPCWID mutually agreed to drop any claims in the quiet title case.

Good Faith Negotiations with Other New Mexico Amici

38. Unfortunately, the Settlement Package does not resolve all pending litigation in the Lower Rio Grande in which New Mexico, the United

States, EBID and New Mexico's Amici (the City of Las Cruces, New Mexico Pecan Growers, Albuquerque Bernalillo County Water Utility Authority, New Mexico State University, the Southern Rio Grande Diversified Crop Farmers Association, Public Service Company of New Mexico, and Camino Real Regional Utility Authority) are parties. Further, all water users in the LRG, including the New Mexico Amici, have a direct interest in how New Mexico will administer water to comply with the Compact Decree and Groundwater Settlement Agreement.

39. While priority administration is always an option, the AWRM Statute and AWRM Framework Rules allow the State Engineer to approve plans for alternative administration based on water sharing agreements or other provisions. My hope is that the New Mexico Amici, New Mexico, EBID, and the United States will agree to a plan for alternative administration that will allow for the settlement of pending litigation, meet the needs of water users in the LRG, and allow New Mexico to meet its obligations under the Settlement Package.
40. Section II.B of the Operations Settlement Agreement is included to allow for those negotiations. It provides a window until October 1, 2026 for good faith negotiations to resolve remaining adjudication and administration issues. New Mexico, the New Mexico Amici, and EBID have already begun meeting to discuss options for alternative administration.

The Groundwater Settlement Agreement

41. The Groundwater Settlement Agreement addresses issues related to groundwater administration in the Lower Rio Grande. Along with the other agreements, it addresses the United States' claims in the Original Action. For that reason, the Groundwater Settlement Agreement provides that the United States' claims against New Mexico and New Mexico's counterclaims against the United States shall be dismissed with prejudice, including "all claims for Compact violations, Project interference, damages, declaratory relief, and injunctive relief asserted or which could have been asserted in the Original Action." Groundwater Settlement Agreement, 6, § II.C.
42. The Groundwater Settlement Agreement contains provisions for Depletion Reduction, Enforceable Hydrologic Conditions, and the LRG Plan. I

address aspects of each provision below.

Depletion Reduction

43. The Groundwater Settlement Agreement provides that New Mexico shall reduce depletions by 18,200 acre-feet. As set forth in Dr. Barroll's Declaration, the intent of this provision is to reduce depletions to approximate the D2 baseline level of depletions. New Mexico considers Depletion Reduction to be important because both the Compact Decree and the Operations Settlement Agreement utilize a D2 baseline. Therefore, returning to a D2 baseline will help New Mexico comply with its obligations under the Compact Decree while also receiving its apportionment.
44. To reduce depletions in the Lower Rio Grande, New Mexico will Permanently Retire Groundwater as defined in the Groundwater Settlement Agreement.
45. A concern of New Mexico was to avoid disputes in the future over how depletion reductions should be calculated. To avoid those disputes, the United States and New Mexico agreed up front to the calculations for satisfying the Depletion Reduction obligation in the Groundwater Settlement Agreement. As an example, if New Mexico Permanently Retires Groundwater associated with Combined-Right Lands, that is lands within EBID that have both surface and groundwater rights, each acre will be calculated to reduce depletions by 1.97 acre-feet per year. *See* Groundwater Settlement Agreement at 7, § III.C.2. Based on the agreed upon calculations, if New Mexico Permanently Retires Groundwater associated with 9,240 acres of Combined-Right Land (9,240 acres x 1.97 acre-feet per acre = 18,202.8 acre-feet) in ten years, it has fully satisfied its Depletion Reduction obligation.
46. A second concern for New Mexico was the possibility of future disputes over whether New Mexico remained at the D2 level of depletions each year. To avoid this dispute, the single Depletion Reduction metric contained within the Groundwater Settlement Agreement is the 18,200 Depletion Reduction obligation. Once New Mexico has achieved the Depletion Reduction obligation as calculated in the agreement, there is no mechanism for comparing current-year depletions to the D2 Period on a

regular basis. Instead, the Groundwater Settlement Agreement includes specific provisions for maintaining the Depletion Reduction obligation. For example, while surface water can be used elsewhere within the Lower Rio Grande, for incidental uses on the Permanently Retired Lands, or for Allocation Transfers, no groundwater can be used on the lands that are Permanently Retired. To maintain this reduction, groundwater can only be transferred onto the Permanently Retired Lands if it results in no net increase in depletions. The OSE District IV office reviews all applications in the Lower Rio Grande and is adept at evaluating whether a change will result in new depletions. Similarly, New Mexico has, for the past two decades, consistently rejected applications for new groundwater appropriations. As a part of the Groundwater Settlement Agreement, New Mexico has agreed to close the Lower Rio Grande to applications for new appropriations of groundwater. After the basin is closed, no applications for new groundwater permits will be entertained by the State Engineer, thus preventing new depletions.

Enforceable Hydrologic Conditions

47. The Groundwater Settlement Agreement includes two enforceable hydrologic conditions -- UVDR3 and Aquifer Storage Loss. Dr. Barroll describes both conditions in her Declaration. New Mexico shares a concern with the United States over the condition of the Rincon and Mesilla aquifers in the Lower Rio Grande. New Mexico agreed to the two enforceable hydrologic conditions, in part, because the condition of the Aquifer impacts New Mexico's ability to meet delivery obligations under the Compact Decree.
48. Due to the complex nature of hydrology and water administration, there are factors beyond New Mexico's control that affect both the UVDR3 and Aquifer Storage Loss. New Mexico's obligation, therefore, is to take all reasonable actions to satisfy these metrics, while also considering Project Viability. I confirm that New Mexico will take actions to address the UVDR3 and Aquifer Storage Loss metrics as contemplated by the Groundwater Settlement Agreement.
49. New Mexico has administrative tools and options to meet its obligations under the Groundwater Settlement Agreement and Compact Decree and is committed to using those tools and options to ensure it remains in

compliance with the Groundwater Settlement Agreement and Compact Decree:

- a. As described above, New Mexico is a prior appropriation state and one option is to administer groundwater pumping by priority to ensure that the terms of the Groundwater Settlement Agreement and Compact Decree are met. However, there are additional tools that can achieve targeted reductions to ensure compliance as I describe below.
- b. One of the tools New Mexico may implement is the Permanent Retirement of additional groundwater, beyond what is required by Section III.A. The Groundwater Settlement Agreement recognizes this option.
- c. New Mexico may employ temporary fallowing and conservation measures to meet shorter-term needs to reduce groundwater withdrawals. The ISC has demonstrated the feasibility of doing so through its Lower Rio Grande Groundwater Conservation Program with over 6,000 acres of irrigable land currently enrolled and fallowed. Further, because the OSE District IV Office meters groundwater withdrawals and monitors the amount of irrigated acreage, it has the ability to monitor depletion levels and respond accordingly.
- d. New Mexico has worked with, and will continue to work with, municipal water suppliers and users in the Lower Rio Grande to implement conservation measures, to maximize the benefits of regionalization, and to optimize the use of return flows and offsets to assure compliance with the Groundwater Settlement Agreement and Compact Decree for current and future conditions.
- e. New Mexico has worked with, and will continue to work with, agricultural water users in the Lower Rio Grande to maximize the conservation of water and protect the health of the Mesilla and Rincon aquifers.
- f. New Mexico may import water to the Lower Rio Grande. The ISC is currently reviewing potential water importation proposals.

- g. Finally, as mentioned above, when voluntary and/or compensated measures are unavailable or insufficient, the State Engineer has the authority to curtail depletions through one or more of the forms of priority administration specified in the AWRM regulations. New Mexico laws and regulations define how priority administration would be implemented.
50. A priority for New Mexico was to retain discretion for how it administers water in the Lower Rio Grande. The Groundwater Settlement Agreement accomplishes this goal.

LRG Plan

51. As part of its obligations under the Groundwater Settlement Agreement, New Mexico agreed to draft the LRG Plan to set forth how it will manage and administer water in the Lower Rio Grande.
52. The Groundwater Settlement Agreement sets forth minimum elements that must be included, but the specific contents of the LRG Plan are within the sole discretion of New Mexico. I intend to involve all relevant stakeholders and significant water users in the development of the LRG Plan, so that it recognizes and incorporates input from the actual water users in the LRG. If, as I hope, water users are able to negotiate a plan for alternative administration, that will be incorporated into the LRG Plan.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on August 29, 2025.

Elizabeth Anderson

Elizabeth K. Anderson, P.E.

SIGNATURE CERTIFICATE



REFERENCE NUMBER
1AEB0E06-B35B-4C39-8EC3-0BAA0F97C364

TRANSACTION DETAILS

Reference Number
1AEB0E06-B35B-4C39-8EC3-0BAA0F97C364

Transaction Type
Signature Request

Sent At
08/28/2025 07:21 PM EDT

Executed At
08/29/2025 12:02 AM EDT

Identity Method
email

Distribution Method
email

Signed Checksum
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Signer Sequencing
Disabled

Document Passcode
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DOCUMENT DETAILS

Document Name
Anderson Declaration 8-28-25 2899471

Filename
Anderson_Declaration_8-28-25_2899471.pdf

Pages
17 pages

Content Type
application/pdf

File Size
78.6 KB

Original Checksum
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SIGNERS

SIGNER	E-SIGNATURE	EVENTS
Name Elizabeth Anderson	Status signed	Viewed At 08/29/2025 12:00 AM EDT
Email elizabeth.anderson@ose.nm.gov	Multi-factor Digital Fingerprint Checksum 4f53cda18c2baa0c0354bb5f9a3ecbe5ed12ab4d8e11ba873c2f11161202b945	Identity Authenticated At 08/29/2025 12:02 AM EDT
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AUDITS

TIMESTAMP	AUDIT
08/28/2025 07:21 PM EDT	Kaleb Brooks (kbrooks@spencerfane.com) created document 'Anderson_Declaration_8-28-25_2899471.pdf' on Firefox via Windows from 50.227.182.78.
08/28/2025 07:21 PM EDT	Elizabeth Anderson (elizabeth.anderson@ose.nm.gov) was emailed a link to sign.
08/29/2025 12:00 AM EDT	Elizabeth Anderson (elizabeth.anderson@ose.nm.gov) viewed the document on Mobile Safari via iOS from 174.205.226.58.
08/29/2025 12:02 AM EDT	Elizabeth Anderson (elizabeth.anderson@ose.nm.gov) authenticated via email on Mobile Safari via iOS from 174.205.226.58.
08/29/2025 12:02 AM EDT	Elizabeth Anderson (elizabeth.anderson@ose.nm.gov) signed the document on Mobile Safari via iOS from 174.205.226.58.

EXHIBIT A

Exhibit A

Elizabeth K. Anderson, P.E.

New Mexico State Engineer

Education

M.S., Environmental Engineering, University of New Mexico (2005)

B.S., Civil Engineering, University of New Mexico (2002)

Professional Registrations

- Professional Engineer: New Mexico, 2008 (18540)
- Certified Operator (NM19199)
 - Water Supply Level 4 (WS4), 2019
 - Wastewater Level 3 (WW3), 2018
- LEED Accredited Professional, 2009
 - LEED = Leadership in Energy & Environmental Design

Curriculum Vitae (CV)

State Engineer Elizabeth (“Liz”) Anderson has over 25 years of experience in water resources engineering. Before serving as State Engineer Designate, Ms. Anderson was Senior Advisor to the State Engineer. She previously served as Chief Planning Officer for the Albuquerque Bernalillo County Water Utility Authority (Water Authority), managing engineering, asset management, and water resources. Ms. Anderson also worked as an engineering consultant, serving as Operations Leader for Jacob’s Engineering water division in New Mexico and West Texas. Mrs. Anderson has a Bachelor of Science in Civil Engineering and a Master of Science in Environmental Engineering from the University of New Mexico. She is a licensed professional engineer, certified water and wastewater systems operator, and LEED-accredited professional.

Positions Served

Role: State Engineer

Employer: NMOSE

Duration: August 17, 2024 – present

Description: Mrs. Anderson currently serves as State Engineer Designate, Secretary to the New Mexico Interstate Stream Commission (NMISC), and commissioner to several New Mexico interstate compacts, including the Rio Grande Compact.

Role: Senior Advisor to State Engineer

Employer: NMOSE (detail assigned from Water Authority)

Duration: 2023 – August 16, 2024

Description: Mrs. Anderson served as Senior Advisor to State Engineer Mike Hamman, supporting water planning, outreach, grant funding, and strategic planning efforts within NMOSE/NMISC.

Role: **Chief Planning Officer**

Employer: Water Authority

Duration: 2020 – 2023

Description: Manages the engineering, water resources, utility development, and asset management divisions, including implementation of all water resources planning, utility rehabilitation and growth projects, development review and permitting, and capital improvement plan (CIP) and grant funding. In this role, Mrs. Anderson served as Chair of the San Juan Chama Contractor's Association.

Role: **Chief Innovation and Performance Manager**

Employer: Water Authority

Duration: 2019 – 2020

Description: Managed performance, policy, and strategic planning processes for the Water Authority. Utilizes systems such as Effective Utility Management (EUM) and AWWA Benchmarking to monitor performance and progress towards goals, in efforts to seek continuous improvement. Coordinator for Customer Conversations, Technical Customer Advisory Committee (TCAC), award applications and grant funding. Working on development and implementation of an Innovation Program for the Water Authority.

Role: **Water Quality Program Manager**

Employer: Water Authority

Duration: 2017 – 2019

Description: Managed the Water Quality Program within the Compliance Division to confirm and maintain compliance with all drinking water requirements. Coordinated with the Operations Division to optimize water systems to deliver the highest quality water, manage assets, and minimize cost to rate payers. Oversaw sampling, data management, customer inquiry, reporting, and distribution system modeling applications.

Role: **Senior Engineer in Centralized Engineering**

Employer: Water Authority

Duration: 2016 – 2017

Description: Managed capital improvement projects (CIP) through planning, design and construction, while coordinating with Water Authority staff, consultants, and contractors. Utilized Sharepoint for data management. Coordinated system modifications with the Geographic Information System (GIS) group to update maps as projects were completed.

Role: **New Mexico Water Operations Leader & Project Manager**

Employer: CH2M Hill Engineers

Duration: 2014 – 2016

Description: Managed Water Business Group staff in offices and construction sites throughout New Mexico and West Texas. Managed staff, project delivery, and local business decisions, including hiring and integration of staff. Managed staff performance including recognition and disciplinary actions. Project manager for engineering projects through concept development, design, permitting, construction, and startup.

Role: **Project Engineer**

Employer: CH2M Hill Engineers

Duration: 2005 – 2014

Description: Worked with project managers to complete design and construction of water and wastewater projects, including feasibility studies, pilot testing, start-up, and operations.

Representative Project Experience

Role: **Permit Manager**

Project: Eastern New Mexico Rural Water Systems

Client: Eastern New Mexico Rural Water Authority

Duration: 2012 – 2016

Description: Responsible for attaining permits and approvals from agencies including the New Mexico Environment Department, New Mexico Office of the State Engineer, Army Corp of Engineers, and Roosevelt County.

Role: **Assistant Project Manager and Process Engineer**

Project: Rio Grande Salinity Management Program: Distal Mesilla Basin

Client: United States Corps of Engineers, Albuquerque District

Duration: 2014 – 2016

Description: Served as assistant project manager and process engineer for a study that provided a cost-benefit analysis for alternatives that would divert and treat a naturally occurring salinity source from the Rio Grande in the Distal Mesilla Basin. Completed the conceptual design and cost estimate for a desalination plant to treat well water from several sources of brackish water.

Role: **Process Engineer**

Project: Rio Rancho Wastewater Treatment Plant No. 1 Preliminary Engineering Report

Client: City of Rio Rancho, NM

Duration: 2014 – 2015

Description: Served as process engineer for the preliminary engineering report (PER), which included conceptual-level design of a membrane bioreactor (MBR) plant to replace existing wastewater treatment plant (WWTP) No. 1. The rebuilt WWTP

would be used to supply Class 1A effluent to the City of Rio Rancho's reuse system and potentially direct injection to the aquifer for indirect potable reuse (IPR).

Role: Design Manager and Process Engineer

Project: Satellite Reuse Plant at the University of Texas at El Paso (UTEP)

Client: El Paso Water Utilities (EPWU)

Duration: 2012 – 2014

Description: Managed the design and served as process engineer for the feasibility analysis and conceptual design of a satellite WWTP for EPWU to install at UTEP to provide reuse water for landscape irrigation on campus. This facility would also provide an educational tool for UTEP to use in hands-on teaching with engineering students and water reuse tours for the general public.

Role: Project Engineer

Project: Feasibility Study for the Bosque and Tijeras Reuse Projects

Client: Water Authority

Duration: 2011 – 2012

Description: Completed a feasibility study for two proposed wastewater reuse projects in accordance with the U.S. Bureau of Reclamation (USBR) publication entitled *Reclamation Manual Directives and Standards Water Management and Development (D&S WTR 11-01), Title XVI Water Reclamation and Reuse Program Feasibility Study Review Process*, rev. 2008. The feasibility study looked at installation of two satellite wastewater scalping plants and associated reuse water distribution systems and provided a cost-benefit analysis for each project.

Role: Various Roles (Detailed Below)

Project: Buckman Direct Diversion Project Design-Build Water Treatment Plant

Client: Buckman Direct Diversion Board (Santa Fe, New Mexico)

Duration: 2008 – 2012

Description: The Buckman Direct Diversion (BDD) Project is a 15 MGD green-field water treatment plant delivered via design-build construction. On this project Ms. Anderson served in the following roles:

- **Assistant Process Engineer for System Start-up and Water Treatment Plant Operations.** Responsible for operating the water treatment plant, compliance sampling, process laboratory management, and systems testing during startup operations.
- **Project Environmental Coordinator, Permit Management, Environmental Coordinator, and Community Liaison Support.** Responsible for attaining permits and approvals from agencies including the New Mexico Environment Department, New Mexico Construction Industries Division, Santa Fe County, U.S. Forest Service, Bureau of Land Management, and Army Corp of

Engineers. As onsite environmental coordinator worked with construction crews to ensure the site meets environmental/permit requirements. Supported community liaison activities including production of construction updates flyers using GIS and working with the BDD Board's public relations consultant.

- **Project LEED Coordinator.** Worked with the design manager to incorporate LEED requirements into the drawings and specifications, review LEED submittals, and confirm construction was completed per LEED requirements.

Role: Process Engineer and Bench-Scale Laboratory Analyst

Project: Missouri River WWTP Facilities Improvements

Client: City of Omaha

Duration: 2010 – 2011

Description: Served as process engineer for design of industrial treatment facilities. The industrial treatment facilities were designed to treat up to 18 MGD of meat packing waste from multiple industrial waste sources, including grit removal/handling, primary clarification, and sludge/scum pumping. Completed bench-scale testing that evaluated primary treatment using clarification versus dissolved air flotation. Completed preliminary design of the selected treatment process.

Role: Staff Engineer

Project: Southside Water Reclamation Plant Ultraviolet Disinfection Project

Client: Water Authority

Duration: 2008

Description: Worked with manufacturers and cost estimators to provide cost estimate for proposed system in three potential configurations. Assisted in preparation of a design analysis report for the proposed ultraviolet disinfection system.

Role: Pilot Plant Operator and Staff Engineer

Project: San Juan Chama Drinking Water Treatment Plant

Client: Water Authority

Duration: 2005 – 2007

Description: For the pilot water treatment plant, assisted in procurement, design, construction, and operation. Conducted tours and wrote the operations manual. Facilitated operator training for pilot plant operation. Prepared pilot study memoranda.

Role: Staff Engineer

Project: Vulnerability Assessments

Client: Confidential (various water and wastewater facilities)

Duration: 2005 – 2006

Description: Assisted with vulnerability assessments for water and wastewater systems.

Graduate Studies & Internships

Research Assistant; University of New Mexico, Department of Civil Engineering; Albuquerque, New Mexico; 2003 – 2005. Conducted research on optimized coagulation-assisted microfiltration (C/MF) for arsenic removal. Conducted research of reverse osmosis (RO) and nanofiltration (NF) processes as a means of concentrating nanocolloidal particles.

Pilot Project Technician; WWTP No. 2; City of Rio Rancho; Rio Rancho, New Mexico; 2004. Operation of a pilot-scale integrated membrane system WWTP that provided prescreening, denitrification, final clarification through membrane bioreactor (MBR), disinfection, and RO.

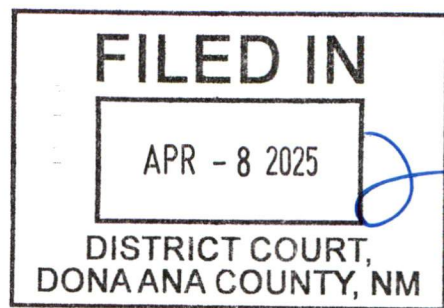
Fluid Mechanics Laboratory Teaching Assistant; University of New Mexico, Department of Civil Engineering; Albuquerque, New Mexico; 2004.

Student Intern; Sandia National Laboratories; Albuquerque, New Mexico; 2001 – 2003.

Survey Teaching Assistant; University of New Mexico, Department of Civil Engineering; Albuquerque, New Mexico; 2000.

Student Intern; Sitts & Hill Engineers, Inc.; Tacoma, Washington; 1999.

EXHIBIT B



**STATE OF NEW MEXICO
COUNTY OF DOÑA ANA
THIRD JUDICIAL DISTRICT COURT**

**State of New Mexico *ex rel.*
New Mexico State Engineer,
Plaintiff,**

v.

**Elephant Butte Irrigation District, *et al.*,
Defendants.**

**No. CV 96-888
James J. Wechsler
Judge Pro Tempore
Subfile No.: LRO-28-099-9001**

**Case No.: 307-OA-9702901 United
States of America**

**Stream System Issue No.: 97-104
D-307-SS-9700104**

SUBFILE ORDER AND FINAL JUDGMENT IN SSL104

This matter having come before the Court in Stream System Issue No. SS-97-104, an expedited inter se established by the Court for the purpose of determining the United States' interests in the Rio Grande Project, and the Court having issued orders granting partial summary judgments on August 16, 2012, and February 17, 2014, and trial having been held August 31 through September 11, 2015, and Findings of Fact and Conclusions of Law entered on April 17, 2017, this Subfile Order and Final Judgment is hereby entered with respect to the right of Defendant

UNITED STATES OF AMERICA

concerning the Defendant's rights in the public waters of the Lower Rio Grande stream system and the Lower Rio Grande Underground Water Basin, as established in connection with the creation of the Rio Grande Project by the U.S. Department of Reclamation, and the Court
FINDS:

1. The Court has jurisdiction over the parties and the subject matter of this suit.
2. Defendant has the right to store, release, and divert the public waters of the Lower Rio

Grande stream system and the Lower Rio Grande Underground Water Basin to others for beneficial use as follows:

SURFACE WATER ONLY

A. Office of the State Engineer File No. 8

(1) Priority: March 3, 1903

(2) Source of water: Surface waters of the Rio Grande and return flow therefrom that retains its identity as Project water. The Court leaves the determination of whether return flow retains its identity as Project water to administrative proceedings conducted before the State Engineer.

(3) Purpose of Use: (a) Storage in Elephant Butte Reservoir and Caballo Reservoir
(b) Release and diversion for any lawful use pursuant to contracts, statutes (including but not limited to the Reclamation Act of 1902 and amendments thereto), compacts, and treaties.

(4) Point(s) of Diversion for this right:

(a) Storage:

Elephant Butte Dam	Location: X= 1,352,264 Y= 784,776 Map: LRO-99
Caballo Dam	Location: X= 1,320,527 Y= 691,495 Map: LRO-99

(b) Diversion

Percha Dam	Location: X= 1,316,917 Y= 681,304 Map: LRO-99
Leasburg Dam	Location: X= 1,432,818 Y= 545,226 Map: LRO-99
Mesilla Dam	Location: X= 1,470,886 Y= 447,052 Map: LRO-99

on the New Mexico State Plane Coordinate System, Central Zone, 1983 N.A.D.

(5) Place of Use: (a) for storage, Elephant Butte Reservoir or Caballo Reservoir
(b) for release and diversion by the United States for use at all locations to which the United States may lawfully divert water pursuant to contracts, statutes (including but not limited to the Reclamation Act of 1902 and amendments thereto), compacts, and treaties.

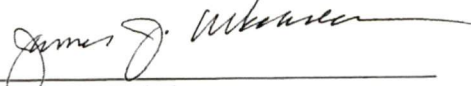
(6) Amount of Water: (a) The right to store in Elephant Butte Reservoir and all other reservoirs below Elephant Butte and above the first diversion to lands of the Project to a maximum storage capacity of 2,638,860 acre feet with the right to continuously fill and refill.

(b) The right to release from storage a normal annual release of 790,000 acre-feet, or as otherwise provided for by the Rio Grande Compact.

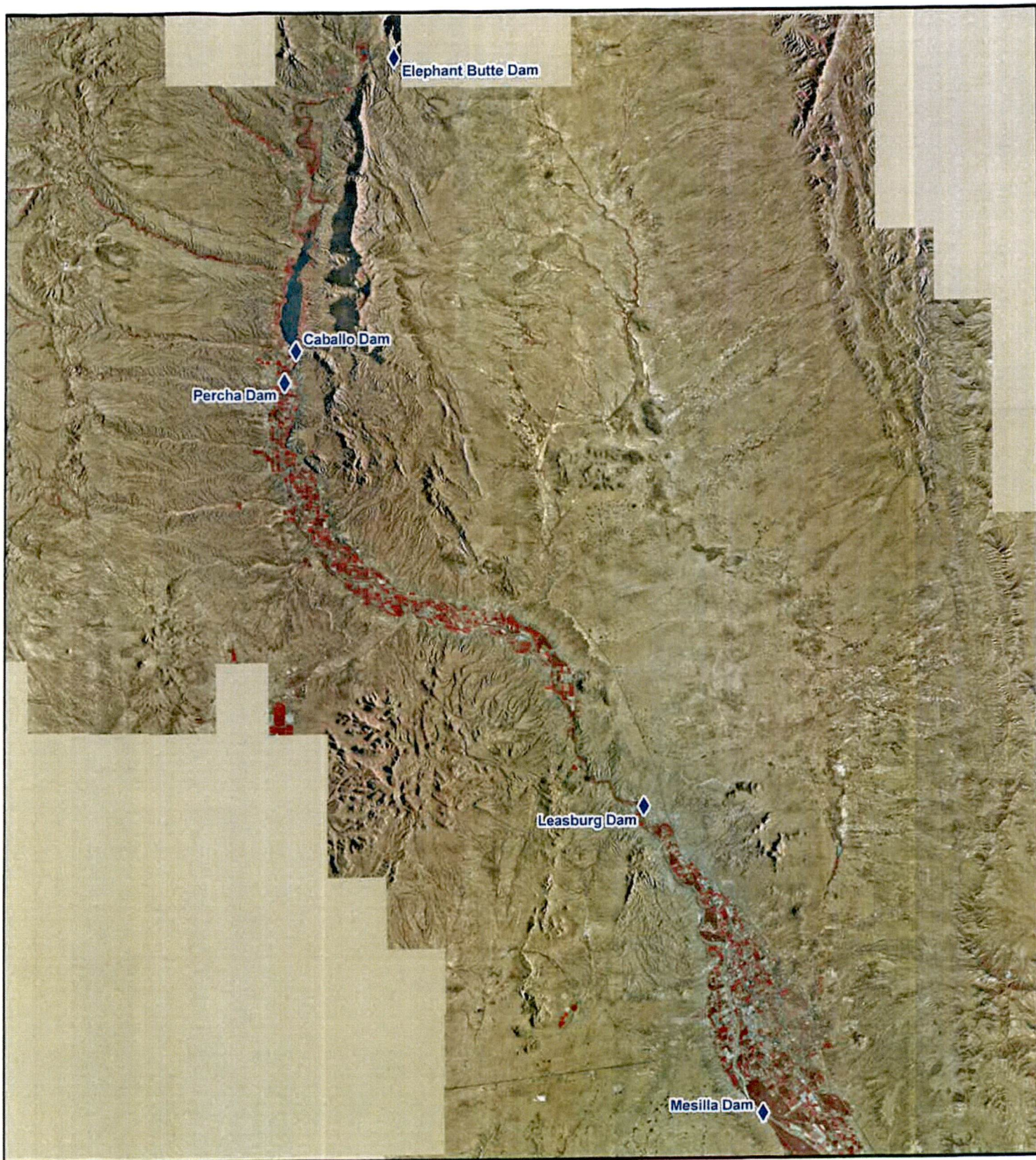
(c) The right to divert Project water from the Rio Grande, without limitation on the diversion amounts, at Percha, Leasburg, and Mesilla diversion dams. The reuse of Project water is an inherent component of the Project's operation.

3. The Court may enjoin and condition the exercise of the Defendant(s)' right(s) to the extent provided by state or federal law.
4. The Defendant(s)' water right(s) have been determined in the course of an expedited *inter se* proceeding, designated as Stream System 104, with participation open to all parties to this adjudication. The terms of this subfile therefore will *not* be subject to objection by other water right owners in final *inter se*.
5. The Defendant(s) will file notice with the Court and provide the Office of the State Engineer with a copy of any change of ownership of all or any part of their water right(s).
6. The Court enters this Subfile Order as a final judgment and subject to appeal.

IT IS THEREFORE ORDERED that the water right(s) of the Defendant(s) are as set forth above. IT IS FURTHER ORDERED that the Defendant and all those in privity with the Defendant are prohibited from any diversion or use of the public underground and surface waters of the Lower Rio Grande stream system and the Lower Rio Grande Underground Water Basin except in strict accordance with the water right(s) set forth in this Order, in other orders of this Court, or as otherwise permitted by law. This restriction in no way affects any additional water rights the Defendant may have in other subfiles.



James J. Wechsler
Judge Pro Tempore



10/04/2024

STATE OF NEW MEXICO
Office of the State Engineer
Elizabeth K. Anderson, P.E.
State Engineer

— Irrigated Tract Boundary Total Irrigated Acreage:	● Irrigation Wells
— EBJD Assessed Tract Boundary Total Assessed Acreage:	○ Domestic / Livestock Wells
— Land with No Right	○ All Other Wells
— Reservoir	▼ Spring
— Land Formerly Irrigated	◆ Headgate or Siphon
	▨ Land with Water Rights Transferred Off
	▨ Encroachments



Lower Rio Grande
Adjudication
Outlying Areas Section

Subfile Number:
LRO -280999001

scale 1:500000

Feet
0 25,000 50,000

EXHIBIT 7

DECLARATION OF CRAIG W. COTTEN,
P.E., IN SUPPORT OF JOINT MOTION OF
THE STATE OF TEXAS, STATE OF NEW
MEXICO, AND STATE OF COLORADO FOR
ENTRY OF COMPACT DECREE
SUPPORTING THE RIO GRANDE COMPACT

No. 141, Original

IN THE
SUPREME COURT OF THE UNITED STATES

♦
STATE OF TEXAS,

Plaintiff

v.

STATE OF NEW MEXICO and
STATE OF COLORADO,

Defendants

♦

DECLARATION OF CRAIG W. COTTEN, P.E.

**IN SUPPORT OF JOINT MOTION OF THE STATE OF TEXAS, STATE
OF NEW MEXICO, AND STATE OF COLORADO FOR ENTRY OF
COMPACT DECREE SUPPORTING THE RIO GRANDE COMPACT**

♦

I, Craig W. Cotten, P.E., hereby declare as follows:

- 1) I am over 18 years of age and have personal knowledge of the facts stated herein. I am competent to testify to the matters herein. If called to testify, I can and will testify in accordance with the following.
- 2) I earned a Bachelor of Science degree in Civil Engineering from Colorado State University (1990) and am a Registered Professional Engineer in Colorado, holding License No. 30527. I possess 34 years of experience in water resources and water administration in the Rio Grande basin. As part of

my position as an engineer I have presented at numerous internal and external short courses and seminars relating to surface and ground water and the Rio Grande Compact. In addition, I have been admitted by the Colorado Water Court as an expert witness in: Rio Grande Compact administration, water resource engineering, surface and groundwater hydrology, water rights administration and management, interpretation and administration of water decrees, water data collection and analysis, water augmentation plans, usage quantifications, replacement calculations, determination of tributary or non-tributary water, aerial photography interpretation, and water rights analysis.

- 3) Since 2009 I have been the Division Engineer for Water Division 3 for the Colorado Division of Water Resources, which encompasses the Rio Grande basin in Colorado. I supervise a staff of approximately 30 employees, who are involved in water rights administration in Colorado's Rio Grande basin. As part of my job duties, I am responsible for water rights administration, diversion records, stream gages and records, administration of the Rio Grande Compact and Costilla Creek Compact, dam safety, and ground water permitting in Division 3. I am involved in the water court process with recommendations, consultations, and data collection for the court and I provide expert testimony in hydrology and water rights administration matters before the Colorado Water Court. I also serve as Colorado's Engineer Adviser to the

Rio Grande Compact Commission and the Costilla Creek Compact Commission. In these roles, I coordinate with the Engineer Advisers from New Mexico and Texas on matters pertaining to the compacts to which they are signatories. I also provide technical advice to Colorado's Compact Commissioner and the state on administration of the compacts and matters pertaining to this case. Prior to my role as Division Engineer, I was responsible for portions of Division 3 water rights administration, diversion records, portions of Compact Administration, dam safety, ground water permitting, and providing technical advice and recommendations for the Colorado Water Court. I have also been the manager of the Hydrographic Program in Division 3 which includes collection, analysis, and review of hydrologic and meteorological data used to operate and maintain stream gaging stations and to develop official streamflow records for the Rio Grande Basin in Colorado. I participated in several streamflow investigations in New Mexico regarding the Rio Grande Compact.

- 4) I have read and am familiar with the proposed Compact Decree submitted with the Compacting States Joint Motion to Enter Compact Decree Supporting the Rio Grande Compact.
- 5) The Compact Decree retains Colorado's authority and discretion to administer water rights according to Colorado laws and for its Rio Grande Compact

obligations. Colorado has historically exercised state authority over its water resources, both for in-state water rights and administration for interstate compacts.

- 6) Colorado is a significant source of water for the American West. All the major river basins in Colorado are governed by a compact. Colorado is home to nine interstate water compacts and two United States Supreme Court equitable apportionment decrees.
- 7) The Colorado Division of Water Resources, headed by the state engineer, has statutory authority to administer the use of water in Colorado. Under Colorado's constitution, unappropriated water is available for appropriation for beneficial uses. Earlier water uses have priority over later uses. When there is insufficient supply, later, or junior, water rights must either stop diversions or replace their impacts to senior water rights. This is also called priority administration.
- 8) The state engineer administers water rights for compacts and promulgates rules to allow the state to meet its compact obligations, in accordance with Colorado law.
- 9) In the Rio Grande basin in Colorado these rules include: Rules Governing the Withdrawal of Groundwater in Water Division No. 3 (the Rio Grande Basin)

and Establishing Criteria for the Beginning and End of the Irrigation Season in Water Division No. 3 for all Irrigation Water Rights; Rules Governing the Measurement of Ground Water Diversions Located in Water Division No. 3, the Rio Grande Basin; and Rules Governing New Withdrawals of Ground Water in Water Division 3 Affecting the Rate or Direction of Movement of Water in the Confined Aquifer System.

- 10) Colorado administers the water rights appropriated by the United States like any other water user in the state. Water rights appropriated by the United States are adjudicated under the Colorado Water Right Determination and Administration Act of 1969. C.R.S. §37-92-101 et seq. The United States files an application for water rights in the Colorado courts which issues a final decree defining the scope of those rights. The United States is likewise subject to state administration for compact compliance. For example, surface rights owned by the United States are curtailed in the same manner as other similarly situated rights for compact deliveries to the Colorado/New Mexico state line. Wells owned by the United States are governed by groundwater management plans operated by water districts. The districts were formed in part to aid in compliance with Colorado's rules. These districts calculate impacts to senior rights caused by their member wells and provide replacement water or

otherwise ameliorate injury. The water districts also manage the Rio Grande aquifers in Colorado for sustainable use.

- 11) The Compact Decree adds gages and measurement methods consistent with past and current administration of the Compact.
- 12) The Compact uses an inflow-outflow index to determine Colorado's annual Compact delivery obligation. Several gages measure inflows in Colorado including: The Rio Grande near Del Norte, The Conejos River near Mogote, the Los Pinos River near Ortiz, and the San Antonio River at Ortiz. Colorado outflow gages are located on the Conejos River near Los Sauces and on the Rio Grande near Lobatos. Colorado's obligations are determined by measurement of flows not known until the end of the calendar year. This is a difficult task that requires knowledge of the hydrologic system, water demand, and estimates of future conditions. Colorado also uses up-to-date information to adjust curtailment of water diversions during the irrigation season. Using these estimates allows Colorado to better meet its end of year delivery targets while allowing use of Colorado's apportionment.
- 13) Accounting at the time of the signing of the Rio Grande Compact relied on twelve index gages and three reservoir gages: on the Rio Grande near Del Norte above the principal points of diversion to the San Luis Valley, on the Conejos River near Mogote, on the Los Pinos River near Ortiz, on the San

Antonio River at Ortiz, on the Conejos River at its mouths near Los Sauces, on the Rio Grande near Lobatos, El Vado Reservoir, on the Rio Chama below El Vado Reservoir, on the Rio Grande at Otowi Bridge near San Ildefonso, on the Rio Grande near San Acacia, on the Rio Grande at San Marcial, Elephant Butte Reservoir, on the Rio Grande below Elephant Butte Reservoir, Caballo Reservoir, and on the Rio Grande below Caballo Reservoir.

- 14) The Compact Commission has previously added and eliminated gages for Compact compliance.
- 15) For example, a 1948 resolution the Rio Grande Compact Commission (“Commission”) eliminated the San Marcial and San Acacio gages, added Elephant Butte Reservoir change in storage, and amended calculation of the New Mexico Article IV tabulation of relationship to eliminate the San Marcial Index Supply and use the new Elephant Butte Effective Index Supply.
- 16) The Compact requires that similar gaging stations shall be maintained and operated below any other reservoir constructed after 1929, and at such other points as may be necessary for the securing of records required for the carrying out of the compact; and automatic water stage recorders shall be maintained and operated on each of the reservoirs mentioned, and on all others constructed after 1929. Therefore, multiple additional stream and reservoir gaging stations have been installed and are currently utilized for the accounting of the Rio

Grande Compact. These include but are not limited to: Platoro Reservoir and the Conejos River below Platoro Reservoir, Abiquiu Reservoir and the Rio Chama below Abiquiu Reservoir, and Cochiti Reservoir and the Rio Grande below Cochiti Reservoir.

- 17) The addition of the El Paso gage in the Compact Decree is consistent with past practice of the Commission adding and deleting gage locations.
- 18) The proposed Compact Decree retains the authority of the Commission over compact accounting.
- 19) Each Compacting State has appointed an Engineer Adviser to collect, review, and present data and records for the administration of the Compact, among other duties.
- 20) The Engineer Advisers draft and present an annual report of all data pertinent to administration of the Compact and the Compacting States' rights and obligations under the Compact. The reports include data on gage flows, reservoir storage and evaporation, reservoir capacities, debits, credits, Usable Supply, Credit Water, etc. The Engineer Advisers have authority to determine accuracy of the data used in the report and that authority is retained under the Compact Decree.

EXHIBIT 8

DECLARATION OF MARGARET BARROLL,
PH.D., IN SUPPORT OF JOINT MOTION OF
THE STATE OF TEXAS, STATE OF NEW
MEXICO, AND STATE OF COLORADO FOR
ENTRY OF COMPACT DECREE
SUPPORTING THE RIO GRANDE COMPACT
(WITH ATTACHMENT)

No. 141, Original

In the
SUPREME COURT OF THE UNITED STATES

STATE OF TEXAS,

Plaintiff,

v.

STATE OF NEW MEXICO and STATE OF COLORADO,

Defendants.

OFFICE OF THE SPECIAL MASTER

**DECLARATION OF MARGARET
BARROLL, Ph.D.**

**IN SUPPORT OF JOINT MOTION OF THE STATE OF TEXAS, STATE OF
NEW MEXICO, AND STATE OF COLORADO FOR ENTRY OF COMPACT
DECREE SUPPORTING THE RIO GRANDE COMPACT**

August 29, 2025

I, Dr. Margaret (Peggy) Barroll, pursuant to 28 U.S. C. § 1746, hereby declare as follows:

- 1) I am over 18 years of age and have personal knowledge of the facts stated herein.
- 2) I earned a Bachelor's degree (with Honors) in Physics from Swarthmore College, Pennsylvania, and a Master's degree and Ph.D. in Geophysics, from New Mexico Institute of Mining and Technology in Socorro, New Mexico. My Ph.D. work involved groundwater modeling.
- 3) From 1988 until 1991, I was a hydrologist employed by D.B. Stephens and Associates in New Mexico.
- 4) From 1991 to 2017, I worked for the New Mexico Office of the State Engineer ("OSE"). During my career with the State Engineer, I was a staff member of the Hydrology Bureau, and I developed groundwater models, including models that simulated the operations of surface water irrigation systems; I evaluated water right applications; and I provided support to the adjudication branch of the OSE and to the Interstate Steam Commission ("ISC").
- 5) Currently, I am a senior water resources hydrogeologist consultant performing technical analysis and consultation for the OSE on Rio Grande basin issues.
- 6) In addition to my involvement in this case, I have provided written and oral testimony as to my expert opinions in numerous water rights administrative

hearings and cases in New Mexico, and I have been presented and accepted as an expert in hydrology and groundwater modeling. I have also provided expert testimony in the on-going New Mexico state water adjudication case relating to the Lower Rio Grande, *State of New Mexico ex rel. State Engineer v. Elephant Butte Irrigation District et al.*, No. D-307-CV-96-888 (the “LRG Adjudication”).

- 7) My professional involvement with Lower Rio Grande issues within New Mexico and Texas began around 2000. My technical work has involved, among other things:
- a) In-depth review of Rio Grande Project records relating to Project allocation, accounting, operations and history.
 - b) Quantitative analysis of Rio Grande Project allocation and accounting, compilation of Project allocation and accounting data from numerous sources, and analysis of that data.
 - c) Numerous field visits to Rio Grande Project locations in both New Mexico and Texas generally for the purposes of identifying and inspecting critical infrastructure and observing farm management practices.
 - d) Numerous meetings and discussions with the personnel who manage Rio Grande Project water allocation, accounting, and distribution.
 - e) Review and analysis of data and studies related to Lower Rio Grande surface water hydrology.

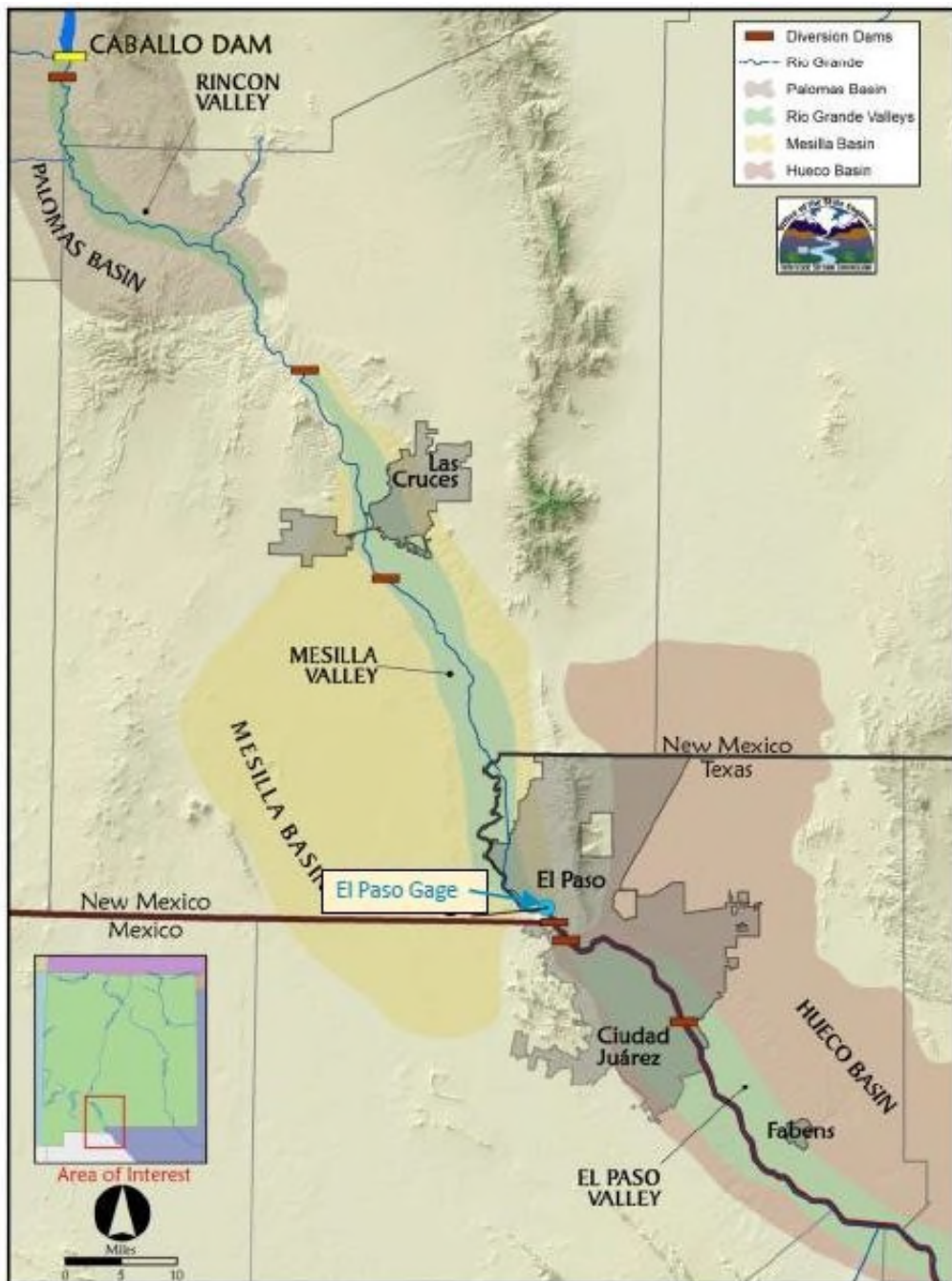
- f) Groundwater modeling of the Lower Rio Grande aquifer system in New Mexico, including the hydrologic effects of the operations of the Rio Grande Project.
 - g) Analysis of groundwater level data both spatially and temporally.
 - h) Trend analyses of groundwater pumping meter data.
- 8) My curriculum vitae is attached to this Declaration.
- 9) I have been retained by the State of New Mexico to provide expert consulting services pertaining to hydrologic and water resource matters presented in this case, and I have authored four reports presenting my analyses and opinions.
- 10) In this Declaration, I refer to the New Mexico District (Elephant Butte Irrigation District or “EBID”) and the Texas District (El Paso County Water Improvement District No. 1 or “EPCWID”) (jointly “Districts”) which are irrigation districts served by the Rio Grande Project (“Project”). The Project is operated by the Bureau of Reclamation (“Reclamation”).
- 11) In this Declaration, I also refer to the following:
- a) Compact, which is the Rio Grande Compact.
 - b) Compact Decree, or Decree, which is the proposed Consent Decree Supporting the Rio Grande Compact .
 - c) EEPI, which is the Effective El Paso Index described in the Compact Decree.

- d) Groundwater Settlement Agreement, which is an agreement between New Mexico and the United States addressing groundwater management issues in New Mexico and attached to the Motion to Dismiss of even date with this Declaration.
- e) Operations Settlement Agreement, which is an agreement between New Mexico, the United States, EBID, and EPCWID addressing Rio Grande Project operation issues and attached to the Motion to Dismiss of even date with this Declaration.
- f) Implementing Contract, which is the Third-Party Implementing Contract between New Mexico and EBID and approved by Reclamation, addressing the use of Project Allocation for Allocation Transfers.
- g) Elephant Butte, which unless specified includes both the dam and the reservoir.
- h) El Paso Gage, which is the stream gage designated Rio Grande at El Paso (USGS 08364000, sometimes referred to as the Courchesne Gage; see Figure 1).
- i) Caballo Release, which is the amount of water release from Caballo Reservoir annually as measured at the Caballo gage (USGS 08362500)
- j) Caballo Release Season, which is that part of a year during which water is released from Caballo Reservoir to meet the purposes of the Project..

- k) D2 Period, which is the time period from January 1, 1951, through December 31, 1978.
- l) Project Allocation, which is the annual amount of water each District is entitled to order from the Project for delivery to its canal headings, or the process (“Allocation Process”) by which Reclamation determines this amount.
- m) Project Accounting, which is the process by which deliveries to each District are accounted for and charged against each District’s Allocation.
- n) Project Operations, which includes Project Allocation, Project Accounting, and the process by which the Districts order and receive their share of water from the Project.
- o) Allocation Transfers, which are transfers of Project Allocation from one District to the other, as contemplated by the Compact Decree and the Operations Settlement Agreement.
- p) Depletion Reduction, which is the reduction in groundwater depletions by 18,200 acre-feet per year in New Mexico as contemplated in the Groundwater Settlement Agreement.
- q) The El Paso Valley, which is the part of the Rio Grande Valley, located downstream of the El Paso Gage, containing the larger part of the Texas District (see Figure 1).

- r) The Texas Mesilla, which is the part of the Rio Grande Valley located upstream of the El Paso Gage that is within Texas and contains the smaller part of the Texas District.'

Figure 1: Project Area



- 12) On behalf of New Mexico, I participated as a primary member of the technical review and support committee that assisted counsel in extensive negotiations and drafting of the Consent Decree and supporting Effective El Paso Index (“EEPI” or “Index”). I worked closely with counsel and technical personnel on evaluating the Index methodology and analyzed all data supporting the calculations for the Index methodology. I also participated as a primary member of the technical group that assisted council in negotiation and drafting of the Operations Settlement Agreement and the Groundwater Settlement Agreement, and parts of the Implementation Contract. My evaluation included analysis of the methodology under diverse possible situations to assure Compact compliance in various hydrologic scenarios. The Consent Decree, the EEPI, the Groundwater Settlement Agreement, and parts of the Operations Settlement Agreement and Implementing Contract are a result of my work with counsel and other technical experts. The statements in this declaration are my own opinions and derived from my direct involvement in assisting with drafting these four documents and supporting materials, and my analysis, and analysis I oversaw or participated in, evaluating the hydrologic outcome associated with implementation of these agreements.

New Mexico’s Compact Article IV Obligations

- 13) Article IV of the Compact (modified by the 1948 Resolution) defines New

Mexico's obligations to deliver water at Elephant Butte, more than 100 miles upstream of the New Mexico-Texas state line. The water delivered by New Mexico under Article IV supplies the Rio Grande Project, which allocates and distributes water to irrigation districts in New Mexico and Texas. The Project existed when the Compact was negotiated. Reclamation releases water from Caballo Dam and delivers that water to diversion points in New Mexico and Texas. Reclamation in effect accomplishes the delivery of the water apportioned to Texas and New Mexico below Elephant Butte. The Compact Decree addresses New Mexico's Compact obligation in this 100-mile reach of the Rio Grande, and the concurrent Groundwater Settlement Agreement and Operations Settlement Agreements address other issues in this reach and help facilitate New Mexico's Compact compliance.

Rio Grande Project

- 14) Reclamation operates the Rio Grande Project which distributes the waters of the Rio Grande below Elephant Butte between New Mexico and Texas within the Project and to Mexico in accordance with international treaty. The authorized acreage (155,000 acres) of the Project is divided 57% in New Mexico and 43% in Texas.
- 15) Initially, and up until about 1980, Reclamation took water orders directly from Project farmers and delivered water to those farmers. In the late 1940's,

Reclamation started to set allotments (expressed in acre-feet per acre), which limited those orders based on the available water supply. Each acre of Project land was entitled to order water up to the annual allotment set by Reclamation. Therefore New Mexico farmers were entitled to order approximately 57% of the water delivered by the Project and Texas farmers were entitled to order 43%.

- 16) During the years 1951 through 1978 (the D2 Period) the Project experienced severe water shortages. Farmers in both New Mexico and Texas drilled and heavily utilized numerous irrigation wells and pumped groundwater to make up for inadequate surface water supplies, thus maintaining the viability of the Project during a period of extreme drought.
- 17) Diversion and farm delivery data indicates that prior to and during the D2 Period, water delivered to the Districts split approximately 57% to the New Mexico District and 43% to the Texas District.
- 18) In approximately 1980, Project Operations changed so that Reclamation started allocating water to the Districts and delivering water to the Districts at canal headings, instead of allotting and delivering water to farmers. When Reclamation started allocating water to the Districts, the Districts began setting allotments for their farmers, limiting farm orders on an acre-feet per acre basis.
- 19) During the early 1980's Reclamation developed an Allocation Process based on a regression of Project releases and diversions during the D2 Period (1951-

1978), known as the D2 Equation. The D2 Equation incorporates the impact of groundwater pumping in both states on the surface waters of the Rio Grande Project during the D2 Period.

- 20) Project Operations changed again in 2008 when the Districts and Reclamation entered into an Operating Agreement, which modified the Allocation Process. The 2008 Operating Agreement uses the D2 Equation as part of its Allocation Process to determine the Allocation to the Texas District.
- 21) As part of this original action, New Mexico has raised concerns about the 2008 Operating Agreement on several grounds, including that under the 2008 Operating Agreement EBID was receiving far less than 57% of the water delivered by the Project. New Mexico was also concerned that the implementation of the 2008 Operating Agreement had the following deleterious effects:
 - a) Reduced EBID's Project Allocation due to the impacts of groundwater pumping in Texas,
 - b) Reduced EBID's Project Allocation due to Project Accounting for EPCWID credits associated with operations in the El Paso Valley, and
 - c) Reduced EBID's Project Allocation by the introduction of "Project Carryover," by which one District can maintain its unused allocation from one year and make use of that Allocation in subsequent years.

Compact Decree

- 22) The Compact Decree quantifies New Mexico's obligation to deliver water to Texas below Elephant Butte by the EEPI methodology. The EEPI directly addresses how the water delivered by New Mexico to Elephant Butte, pursuant to the Article IV of the Compact, is divided between, and delivered to, southern New Mexico and to Texas.
- 23) I have reviewed the August 2025 declaration of Dr. William Hutchison, expert for Texas, and I agree that his declaration accurately describes and documents the EEPI and the development of the EEPI.
- 24) The EEPI methodology defines the following quantities:
- a) Index Delivery, which is the amount of water Texas receives each calendar year at the El Paso Gage, after Mexico's delivery has been accounted for (see below), minus Excess Flows (which are generally waters passing the El Paso Gage that are not available for use in Mexico or Texas), and adjusted for Texas depletions above the El Paso Gage (that is, in the Texas Mesilla).
 - b) Index Obligation, which quantifies Texas's annual entitlement to Index Delivery, and New Mexico's obligation to deliver to Texas its share of Rio Grande water. The Index Obligation is calculated as a function of the Caballo Release in the current and previous years, and this functional relationship was developed based on Index Deliveries during the D2 Period.

c) Annual Index Departure, which is the difference between the Index Obligation and the Index Delivery for a given year, computed as the Index Delivery minus the Index Obligation.

d) Accrued Index Departure, which is the ongoing sum of Annual Index Departures, subject to several Index accounting provisions in the Compact Decree.

25) A positive Annual or Accrued Index Departure indicates an over-delivery to Texas; a negative Annual or Accrued Index Departure indicates an under-delivery to Texas.

26) The hydrologic conditions and the state of water use and groundwater development during the D2 Period are incorporated into the Index Obligation Decree, II.B.2.e. The D2 Period is a reasonable baseline period for the development of the Index Obligation for the following reasons:

a) The Project's distribution of water between the states during this time (57% to New Mexico, 43% to Texas) is equitable and consistent with the 1938 Downstream Contract,

b) Water use during this period includes the groundwater pumping necessary to support the Project during drought, and the Project itself is integral to the delivery of Compact apportionments below Elephant Butte.

c) The D2 Period baseline is consistent with decades of Rio Grande Project

operations, in that Reclamation used this time period as the basis for Project Allocation methods since approximately 1980.

- 27) This division of water between New Mexico and Texas during the D2 Period is consistent with the percentage of Project-authorized acreage in each state, the normal operations of the Project that historically provided each Project acre with an equal entitlement to water, and also with the 1938 Downstream Contract, which provides for a 57% - 43% distribution of water in the event of a shortage.¹
- 28) The amount of groundwater pumping that occurred during the D2 Period is accounted for within the EEPI because the effects of that pumping are included in the foundational data from which the EEPI was developed. This constrains the amount of New Mexico water use and groundwater development to that which will allow compliance with the Compact Decree and the Index Obligation.
- 29) The Compact Decree provides for “Negative Departure Limits,” which are the limits on the negative Accrued Index Departure which determine whether or not New Mexico is in compliance with the Compact Decree. Decree, II.C. The Negative Departure Limits are analogous to the limits on New Mexico and

¹ See Contract (Feb. 16, 1938), Tr. Ex. JT-0426.; *see also* F. Clayton, Texas Compact Commissioner, to S. Smith, Tr. Ex. NM 2119.

Colorado accrued debits contained in Article VI of the Compact.

- 30) The Negative Departure Limit for the first 5 years of Compact Decree implementation is 150,000 acre-feet, and 120,000 acre-feet thereafter. Decree II.C.4.a. These Negative Departure Limits are based in part on the observed behavior of Accrued Index Departures during the D2 Period, which were determined by comparing the Index Deliveries for each year during the D2 Period to the Index Obligation calculated by the regression formula. Calculations using historical data (provided in the spreadsheet attached to Dr. Hutchison's August 2025 declaration) show that during the D2 Period the maximum negative Accrued Departure was approximately 154,000 acre-feet. Thus, the Negative Departure Limits are well supported by operational history for the baseline period used to determine the Index Obligation. The Negative Departure Limit is reduced to 120,000 acre-feet after 5 year on the assumption that the operations of the Project would by then have adapted to better conform with EEPI compliance.
- 31) If the Negative Departure Limit is exceeded, New Mexico is out of compliance with the Compact Decree. If the Negative Departure Limit is exceeded for three (3) or more consecutive years, New Mexico must deliver a specified additional amount of water to Texas ("Additional Index Adjustments"). Decree II.C.4.b.
- 32) The Compact Decree also provides that if the negative Accrued Index Departure

exceeds a “Trigger” amount of 80,000 acre-feet, then New Mexico will initiate the additional water management necessary to reduce the negative Accrued Index Departure to less than 16,000 acre-feet within six years. Decree II.D.2.

The purpose of this Trigger is to ensure that measures are taken by New Mexico to reduce the possibility of New Mexico falling out of compliance with the Compact Decree by exceeding the Negative Departure Limit.

- 33) The Compact Decree includes provision for Allocation Transfers, which are a transfer of Project Allocation between the Districts made to address over or under deliveries relative to the EEPI Obligation. Allocation Transfers will be conducted pursuant to the terms of the Operations Settlement Agreement and Implementing Agreement, which provide the operational framework for these Allocation Transfers to occur with the cooperation of Reclamation and the Districts.
- 34) The Compact Decree provides that at the same time an Allocation Transfer is made, there will be an automatic adjustment of the Accrued Index Departure in an amount equal to the Allocation Transfer. This automatic adjustment will cause the Allocation Transfer to have timely impact on Accrued Index Departure, allowing New Mexico to effectively address EEPI under-deliveries, as well as providing water users in the state receiving the Allocation Transfer access to additional water to be ordered when the water is needed. Decree

II.B.3.c.

- 35) The Compact Decree also provides that all positive or negative Accrued Index Departures will be extinguished when there is a Compact Spill. Decree II.E.4. This provision is analogous to the way the Compact treats New Mexico and Colorado Compact Credits and Debits in cases of Compact Spill.
- 36) The Compact Decree also provides protections to New Mexico against the negative impacts that may be Project Carryover.
- a) The Compact Decree provides that any negative Accrued Index Departure will be extinguished if EPCWID's Project Carryover exceeds certain limits over a 3-year period. Decree II.C.4.c. This provision was included in acknowledgement that if EPCWID has accumulated and maintained a large amount of Project Carryover, demands for water in the Texas District have been met, and New Mexico has not deprived it of needed water.
- b) The Compact Decree, in Appendix 1, also provides that the effect of EPCWID Project Carryover will be considered when determining whether New Mexico is in violation of the Negative Departure Limit. This provision was included so that New Mexico is not considered out of compliance at a time in which Texas has access to, and control of (through Project Allocation), the water that New Mexico would need to deliver to prevent violation of the Negative Departure Limit.

- 37) In my professional opinion, these provisions of the Consent Decree largely mitigate the impact of Project Carryover on the performance of the EEPI and generally protect New Mexico from potential adverse effects of Project Carryover by the Texas District. These provisions may have the added benefit of discouraging the Texas District from locking up large amounts of Carryover for multiple years.

Effect of Compact Decree on the Project

- 38) The Consent Decree will not alter the process by which the Project allocates water to the Districts. Allocations will continue to be calculated by Reclamation through an ongoing process in which initial allocations are updated and refined as new information becomes available (such as storage, releases, diversions, and allocation charges) and finalized at the end of the year. If Allocation Transfers associated with EEPI compliance occur, then one additional type of new information will be incorporated into the Allocation process at beginning of each irrigation season: the amount of the Allocation Transfer. The process for Allocation Transfers (including limitations and timing requirements) will be formally incorporated into Project Allocation as described in the Operations Settlement Agreement.
- 39) The Compact Decree will not change the day-to-day operations of the Project. As before, the Districts will order water against their respective Project

Allocations, and Reclamation will release water as needed to meet those orders. The EEPI is an end-of-year calculation, based on gaged flows and calculated depletions in the Texas Mesilla, and the EEPI calculation occurs independently of Project operations. Based on EEPI results, Allocation Transfers, as described above may occur in subsequent years, in accordance with the procedures described in the Operations Settlement Agreement.

- 40) During the Caballo Release Season, Reclamation receives ongoing water orders from the Districts, as the Districts utilize their Allocations. Each District order quantifies the flow rates required at delivery points. The Project operators then determine the release rate from Caballo Dam that will fulfill those orders, as well as the scheduled delivery to Mexico. Water is released from Caballo at the determined release rate and adjusted as necessary for variation in conditions. If conveyance losses are higher than expected, then releases from Caballo are increased until deliveries meet the orders. Under the Compact Decree, this process will not change.

Operations Settlement Agreement

- 41) The Operations Settlement Agreement (“OSA”) deals with a number of issues related to the Rio Grande Project, the irrigation Districts, and New Mexico including the following:
 - a) Calculation of Index Obligations, Index Delivery, and Index departures, to

be performed consistent with the EEPI calculations in the Compact Decree,

- b) Modifications to Project Allocation and Project Accounting that address concerns raised by New Mexico about the 2008 Operating Agreement and bring the Project operations into better alignment with the Compact Decree and EEPI methodology,
 - c) Provision for New Mexico to order Allocation Transfers from EBID to EPCWID, which allows New Mexico to address negative Accrued Index Departures (or under-delivery to Texas), by providing water to Texas when that water is needed, and
 - d) Provision for Allocation Transfer from EPCWID to EBID as necessary to address positive Accrued Index Departures (or over-delivery to Texas).
- 42) The OSA incorporates the calculation of Index Obligation, Index Delivery, and Index annual and accrued departure, to provide a basis for Allocation Transfer from EPCWID to EBID when the positive Accrued Index Departure exceeds 50,000 AF. These calculations are consistent with the EEPI calculation described in the Compact Decree (particularly in Appendix 1 of the Compact Decree), and the OSA provides for consultation with New Mexico if the Project's Index calculations differ significantly from that of the Compacting States.
- 43) I am aware of two discrepancies between the calculations described in the

Compact Decree and the Operations Settlement Agreement: 1) the OSA does not include a one-time adjustment of up to 20,000 acre-feet on the annual accrued departure which under the Compact Decree occurs within 5 years of the effective date of the Compact Decree; and 2) Also the OSA does not include adjustments to accrued departures that would occur associated with “Additional Index adjustments” associated with Negative Accrued Departures in excess of the 150,000/120,000 AF Negative Departure Limits. The parties have agreed that when the first issue arises, and if the second issue ever arises, the adjustment to the Index departure calculated under the OSA will be handled in the consultation process mentioned above in the previous paragraph of this declaration.

- 44) The OSA alters the Project Allocation Process by adopting the Modified D2 Equation. The Modified D2 Equation is a two-year regression equation derived from the same data as the D2 Equation. This change harmonizes Project Allocation with the EEPI methodology. The EEPI Delivery Obligation is also based on a two-year regression of a very similar data set from the D2 Period: Caballo releases, Project diversions above El Paso, and flows past the El Paso gage. As a result of this change in the Allocation Process, the Project Allocation to the Texas District, for a given Caballo release, will align with New Mexico’s EEPI Delivery Obligation to Texas for that same Caballo Release (although the

values will not be exactly the same).

45) The OSA modifies Project Accounting by making American Canal heading the point at which deliveries to EPCWID in the El Paso Valley are charged. This change simplifies Project Accounting for the El Paso Valley by eliminating accounting at a number of diversion points. This change also brings the Project charge point for the El Paso Valley close to (with about 1.5 miles of) the El Paso Gage, which is the EEPI delivery point for the Texas El Paso Valley. In addition, this change addresses some of New Mexico's concerns with Project Accounting by:

- a) Eliminating the Haskell Street Credit, thereby eliminating adverse effects on New Mexico causes by the application of that credit; and
- b) Changing the accounting for the ACE credit in a way that benefits New Mexico; and
- c) Eliminating any impacts of Texas groundwater pumping downstream of American Dam on Project Accounting.

46) The OSA and the Implementing Contract also provide a framework under which New Mexico can work cooperatively with the United States and the Districts to accomplish the Allocation Transfers that may be necessary for New Mexico's EEPI compliance, and ensuring that any over-delivery of water to Texas is addressed. These agreements place rules and conditions on Allocation

Transfers which provide New Mexico the ability to perform Allocation

Transfers when needed while limiting impacts on the annual operations of the Districts.

- 47) The OSE and Implementing Contract allow New Mexico to use EBID surface rights acquired as part of Depletion Reduction to supply Allocation Transfers. New Mexico will be able to transfer the annual Allotment water associated with those rights, and any annual Allotment water it does not transfer, or use elsewhere, accumulates in a credit account up to a maximum of 60,000 acre-feet. New Mexico may also acquire and transfer Allocation that EBID forbears. Once the 60,000 acre-feet limit on the credit account has been exceeded, any annual allotment water that New Mexico does not transfer or use elsewhere is available to EBID farmers, thus increasing their surface water supply, and reducing their need for groundwater pumping.
- 48) The OSA and Implementing Contract also place limitations on New Mexico's total annual Allocation Transfers, depending on EBID's annual Allocation, with provisions for exceptions if the parties to those contracts agree. New Mexico's accumulated credit or forbearance water cannot be part of an Allocation Transfer that makes EBID's Project Allocation to fall below 100,000 acre-feet, or make up more than 20% of EBID's Project Allocation. Regardless of these limitations New Mexico will be allowed to transfer that year's annual Allotment

water in any year, including any annual Allotment it leases from other EBID members.

- 49) In my professional opinion, the provisions and limitations of the OSA and Implementing Contract will allow New Mexico to make Allocation Transfers as necessary to maintain EEPI compliance under most circumstances, while preventing Allocation Transfers from disrupting the EBID allotment process under low-supply conditions. However, since New Mexico's acquisition of surface water rights through the Depletion Reduction Program will not occur instantaneously, and depends on willing sellers, there probably will not be a large amount of annual Allotment water for New Mexico to transfer in the early years of the implementation of the Compact Decree.

Groundwater Settlement Agreement

- 50) The Groundwater Settlement Agreement ("GSA") describes New Mexico's future actions to reduce groundwater depletions, protect the operations of the Rio Grande Project, and manage groundwater use.
- 51) The first part of the GSA describes New Mexico's commitment to reduce groundwater depletions in the New Mexico part of the LRG by 18,200 ace-feet per year ("Depletion Reduction"). Depletion Reduction will reduce the total depletions in the New Mexico LRG to a level consistent with the D2 Period, and it will therefore improve the ability of New Mexico to comply with the

EEPI, which is predicated on a D2 Period baseline.

- 52) The Depletion Reduction target of 18,200 acre-feet per year is based on a comparison of New Mexico's calculation of the average consumptive use of water in the New Mexico LRG during the D2 Period to the average consumptive use during a recent period (2008–2017), that is detailed in Attachment 2 to this Declaration. In summary:
- a) The consumptive use of irrigation water by irrigated agricultural has not increased since the D2 period, with changes to high-water use crop compensated for by a reduction in total irrigated acreage, and
 - b) The consumptive use of water by non-irrigation users has increased by approximately 18,500 acre-feet per year².
- 53) New Mexico will accomplish Depletion Reduction by acquiring and retiring active groundwater rights. All water rights acquired for this purpose must meet specific requirements for recent use and administrative standing. All irrigated acres retired for Depletion Reduction must have been irrigated a minimum of 5 years out of every moving 10-year period since 2010 or have already been accepted into New Mexico's ongoing Lower Rio Grande Groundwater Conservation Pilot Program, which has similar requirements for recent

² An earlier calculation of this quantity, 18,200 acre-feet per year, was adopted as the basis for Depletion Reduction.

irrigation.

54) The majority of the water rights New Mexico acquires for Depletion Reduction will be associated with Project lands that are irrigated by a combination of groundwater and Project surface water rights. When New Mexico acquires such combined rights, it will complete the following steps:

- a) Fallow the associated Project lands,
- b) Retire the groundwater component of these water rights, and
- c) Use part of the surface water component for Allocation Transfer, as provided for in the Compact Decree, and the Operations Settlement Agreement.

55) The GSA determines the groundwater depletion amounts associated with retirement of each acre of irrigated land that will be counted towards Depletion Reduction.

- a) For lands irrigated with a combination of groundwater and Project surface water (combined-right lands), the depletion amount is based on technical analysis of evapotranspiration from remote-sensing data, described in Appendix C of that Agreement, which finds a groundwater depletion of 1.97 acre-feet per acre.
- b) For lands supplied by groundwater only, the depletion amount associated with fallowing is determined to be 2.6 acre-feet per acre, which is consistent

with the analysis in Appendix C.

- 56) These depletion amounts are reasonable and conservative values that consider the fact that lands fallowed as part of Depletion Reduction are likely to have lower water use and lower depletions than the average of all irrigated lands in the Lower Rio Grande. Further depletion savings may occur when the surface water rights associated with combined-right lands are not fully utilized by New Mexico and are available to increase the water available to EBID farmers.
- 57) Depletion Reduction will improve New Mexico's ability to comply with the EEPI in three ways:
- a) Retirement of groundwater rights and fallowing of irrigated land will reduce groundwater pumping and thus reduce depletive effects on the Rio Grande;
 - b) Allocation Transfers supplied by the surface water rights that New Mexico acquires will reduce New Mexico's Negative Accrued Departures under the EEPI; and
 - c) New Mexico's surface water rights that are not needed for Allocation Transfers may be credited for future Allocation Transfers, and will in part be returned to EBID for use on irrigated lands, thus reducing the need for groundwater pumping on those lands.

GSA Enforceable Hydrologic Conditions

- 58) In addition, the GSA contains two sets of provisions termed "Enforceable

Hydrologic Conditions,” which provide for ongoing monitoring of the efficiency of surface water deliveries and of aquifer storage conditions. These provisions allow the United States to assess the effects of New Mexico groundwater pumping on Project operations and to confer with New Mexico about actions New Mexico may take to address groundwater issues.

59) The United States and New Mexico will monitor the efficiency of surface water deliveries through an annual calculation of the Upper Valley Diversion Ratio over the past three years (“UVDR3”). A higher UVDR3 indicates that the Project can delivery water more efficiently, including to the Texas at El Paso gage, which will assist New Mexico with complying with the EEPI.

a) UVDR3 is calculated as a three-year sum of Project canal diversions above the El Paso gage, plus the El Paso gaged flow, plus a term correcting for depletions in the Texas Mesilla. This sum is divided by Caballo Releases summed over the same 3-year period. UVDR3 will be calculated and reported each year.

b) If UVDR3 drops below 0.79, the United States may initiate formal consultation regarding New Mexico’s water resource management. The threshold of 0.79 was a negotiated number, based on review of historical UVDR values from the D2 Period. Dr. Ferguson, in his August 2025 Declaration, reported that the minimum UVDR3 experienced during the D2

Period was 0.79. Therefore, if UVDR3 going forward is below 0.79, that means the aquifer conditions is worse than that of the D2 period.

- 60) Aquifer storage conditions will be monitored under the “Aquifer Storage Loss” provision. This provision requires New Mexico and the United States to develop and maintain a suite of indicator wells in specified locations to monitor groundwater conditions. Data from these indicator wells (and from other existing monitoring wells as necessary) will be used to assess whether Aquifer Storage Loss has occurred from year to year. The parties have chosen indicator well sites that provide good north-to-south coverage of the Rio Grande Valley within New Mexico, in areas that historically have been sensitive to changes in surface water supply. The process will be as follows:
- a) An annual initial evaluation will take place, consisting of a review of water level data from the indicator wells and recent Caballo Release data.
 - b) If the initial evaluation determines that Aquifer Storage Loss has occurred, and the 3-year average of Caballo Release (“CAB3”) is greater than 400,000 AF/yr, then formal consultation between New Mexico and the United States will occur. Formal consultation may also be initiated by the United States if there is disagreement or uncertainty as to the outcome of the initial evaluation.
 - c) Formal consultation, as necessary, will involve technical analysis of

groundwater level data, evaluation of the causes of Aquifer Storage Loss, and evaluation of whether changes in New Mexico management are necessary to address Storage Loss, and what actions would be appropriate.

- 61) The GSA allows for Aquifer Storage Loss to occur when surface water supplies are sufficiently low, such that CAB3 is 400,000 AF or less. When CAB3 is above 400,000 AF, it is anticipated that the aquifer should be stable or should gain water. The 400,000 AF threshold was chosen through negotiation, and it is based on analysis of the amounts of aquifer recharge and groundwater pumping calculated to occur as a function of Caballo Release and irrigated acreage. This analysis suggests that for Caballo Releases above 400,000 AF, it would be possible to balance recharge and groundwater pumping, without fallowing more acreage than is currently thought to be compatible with Project viability. And as described by Dr. Ferguson in his August 2025 Declaration, further analysis indicates that preventing Aquifer storage loss when CAB3 is greater than 400,000 acre-feet will achieve a stable or gaining aquifer condition over the long term.
- 62) My review of historical observed groundwater level data and model simulated groundwater levels indicates that the consultation condition (aquifer storage loss occurring when CAB3 is greater than 400,000 AF/yr) is likely to occur from time to time, even when the aquifer is relatively “full” (high groundwater

levels) or when groundwater levels over the long term have been rising. Sharp changes in water supply may cause the consultation conditions to be met, even under favorable or generally improving aquifer conditions. Therefore, it is important that during the consultation process “the Parties will consider recent conditions as well as longer term trends” (GSA, Appendix E, page 6). If the consultation criteria have been met by a short-term drop in aquifer storage, but the longer-term trend shows aquifer gain, or adequate stability, that should be considered evidence that no new administration action by New Mexico is necessary. If, however, longer-term trends show continuing aquifer loss, that would be considered evidence for the need for additional actions by New Mexico, provided however, such actions must not threaten Project viability through large reductions in irrigated acreage or unbearable restrictions on irrigation groundwater pumping during times of drought.

- 63) My analysis and modeling and the analyses of other New Mexico technical experts indicate that Depletion Reduction will improve New Mexico’s ability to comply with both the UVDR3 and Aquifer Storage Loss provisions of the Groundwater Settlement Agreement. However, if unfavorable hydrologic conditions prevail, additional management actions may be required.

LRG Plan

- 64) The GSA requires that New Mexico will adopt a plan (“LRG Plan”) to manage

and administer water in the lower Rio Grande (LRG). The LRG Plan will address the following issues:

- a) Implementation and maintenance of Depletion Reduction, including maintaining the retirement of groundwater rights and fallowing of retired irrigated acreage;
- b) General water rights administration,
- c) Water rights administration required to address any future issues related to Compact compliance, or the UVDR and Aquifer Storage provision of the Groundwater Settlement Agreement, and
- d) State Engineer Orders, rules etc. necessary to accomplish water rights administration in the LRG

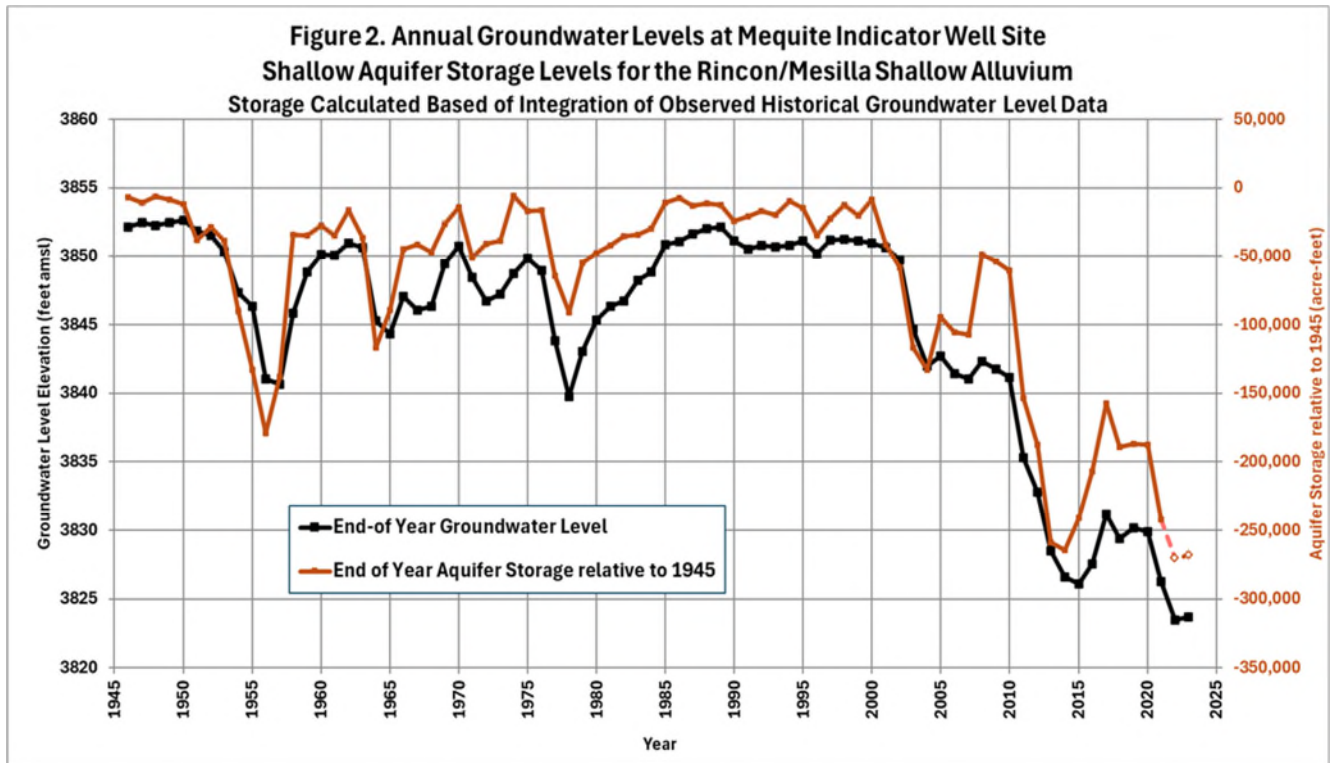
65) An important component of the LRG Plan is intended to allow New Mexico to address situations in which New Mexico, despite Depletion Reduction and Allocation Transfers, is in danger of not complying with the EEPI, or cannot maintain agreed upon surface water delivery efficiency or aquifer storage conditions. Such a situation is most likely to occur if climatic conditions cause consistently low surface water supply for the Project, so that the average surface water supply to the Project going forward is lower than that of the D2 Period.

Comparison of Current Hydrologic Conditions to Those During the D2 Period

66) Hydrologic conditions in the LRG depend greatly on the Rio Grande surface

water supply as provided from upstream. The surface water supply to the LRG can be measured either by the amount of water flowing into the LRG measured at the San Marcial gages, or the amount released into the at Caballo Dam. By either measure, the average surface water supply to the LRG has been lower during the past 20 years than during the D2 Period.

- 67) Groundwater levels, and aquifer storage changes calculated from those levels, are a direct indicator of aquifer condition. Historical groundwater level data from one indicator well site, and the historical aquifer storage changes calculated from groundwater level data from a large set of monitor wells, is shown in Figure 2 below. During the D2 Period groundwater levels fell in response to drought and recovered in subsequent better years. For the past 15 or more years, groundwater levels and aquifer storage values have been consistently as low or lower than groundwater levels during the worst drought years during the D2 Period. This is largely the result of low surface water supply conditions, and the large amounts of groundwater pumping necessary to supply Project irrigation during the past 20-plus years.



- 68) In recent years, low groundwater levels have resulted in extremely low amounts of flow in Project drains and relatively high levels of seepage loss from the Rio Grande. Both of these factors have reduced the efficiency by which the Project can convey water to Project diversion headings and the efficiency by which New Mexico can meet its obligation to Texas at the El Paso gage. Seepage loss from the Rio Grande helps recharge the aquifer, but under the EEPI and the operations of the Project, reduces the amount of surface water available for use by New Mexico farmers.
- 69) I conclude that current hydrologic conditions are worse than those of the D2 Period for which the EEPI was developed. Furthermore, the currently depressed state of the aquifer means that the initial condition today is much

worse than the initial condition for the D2 Period. Until surface water supplies and groundwater conditions improve, New Mexico's compliance with the EEPI will likely require Allocation Transfers from EBID to EPCWID. Until Depletion Reduction is accomplished, and until water supplies improve and groundwater levels recover from the current levels of extreme drought, New Mexico will receive less than 57% of the surface water supply, due to the residual effects of groundwater pumping.

- 70) Once New Mexico reduces depletions to the D2 level, and once surface water supply and hydrologic conditions improve, New Mexico's share of surface water supply under the EEPI will improve, more closely approximating 57%.

Overview Discussion of Global Settlement Package

- 71) The Compact Decree and negotiated agreements now adopted variously by New Mexico, the United States, and the Districts are interrelated. The Compact Decree provides New Mexico with a quantitative delivery requirement (the EEPI) to Texas below Elephant Butte Reservoir, measuring compliance with the Compact. Parts of the Groundwater Settlement Agreement and the Operations Settlement Agreement provide New Mexico with some of the tools New Mexico will need to comply with this delivery requirement.
- 72) In particular, the OSA (together with the Implementing Contract) provides New Mexico with a framework for making Allocation Transfers with the cooperation

of the United States and EBID. These Allocation Transfers will allow New Mexico to transfer water to Texas in such a way that Texas water users can order it when they need it. The Operations Settlement Agreement allows for similar Allocation Transfers from the Texas District to the New Mexico District, as necessary to address EEPI over-deliveries to Texas. The Compact Decree contains provision for these Allocation Transfers, allowing the EEPI delivery departure to be automatically adjusted when an Allocation Transfer occur. Furthermore, through the GSA, New Mexico has agreed to reduce depletions by acquiring and retiring groundwater rights and to monitor and address river efficiency and aquifer storage issues.

- 73) Fulfillment of these provisions of the GSA will generally improve New Mexico's ability to comply with the EEPI and address the United States' concerns with the aquifer conditions and Project delivery efficiency. Furthermore, the water rights acquisition associated with Depletion Reduction will provide New Mexico with Project surface water rights with which it can supply the Allocation Transfers it may need to comply with the Compact Decree.
- 74) I have conducted and participated in technical analysis of the combined effects of the Compact Decree, the Operations Settlement Agreement and the Groundwater Settlement Agreement. On the basis of that analysis, it is my

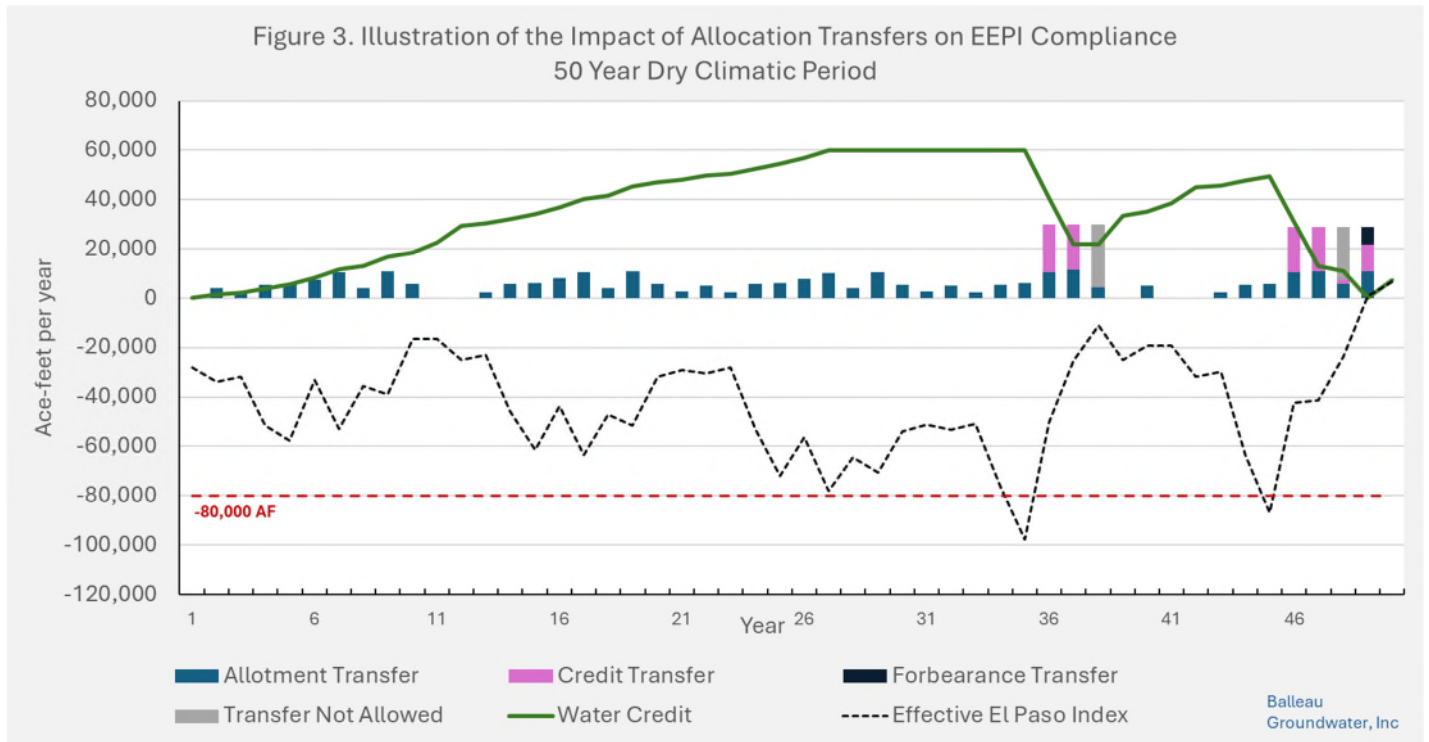
opinion that New Mexico will be able to comply with the EEPI, and the enforceable provisions of the GSA, under climatic conditions similar to the past 25 years, or conditions that are significantly drier, by the following means:

- a) Depletion Reduction to improve aquifer conditions and surface water delivery efficiency
- b) Allocation Transfers, largely supplied by surface water rights obtained as part of the Depletion Reduction, to reduce negative Accrued Departures.
- c) Further groundwater administration under the required LRG Plan, as necessary in response to low surface water supply conditions lasting multiple years.

75) Figure 3 is an illustration of how the Compact Decree and the other agreements are anticipated to work in practice. This figure was generated from a model simulation of the combined settlement package during a relatively dry hydrologic scenario. In this simulation, the annual surface water inflows to the Project are those from the driest 10-year period since 2000, repeated 10 time for a total of 50 years. Key features on Figure 3 are described below:

- a) The black-dashed line represents EEPI Accrued Index Departure. In this example, the departure is negative almost throughout, but does not exceed the -120,000/-150,000 Negative Departure Limit.
- b) The bars indicate Allocation Transfers.

- c) The blue bars indicate that New Mexico is transferring part of the annual Allotment water associated with EBID lands fallowed in New Mexico's Depletion Reduction.
- d) The pink bars indicate that New Mexico is transferring part of its credit account of previously un-transferred annual Allotment water.
- e) The gray bars occur when the amount of Allocation Transfer that can be ordered in that particular year is limited by the conditions of the Operations Settlement Agreement and the Implementing Contract, but because the negative Accrued Departure has recently surpassed the 80,000 Trigger, New Mexico would otherwise have ordered a larger Allocation Transfer.
- f) The black bar indicates that New Mexico is ordering Allocation Transfer when the -80,000 Trigger has been activated, but has insufficient annual Allotment water and credit water, and therefore has elected to use the Forbearance Transfer provision of the Implementing Contract.
- g) The green line indicates the size of New Mexico credit account, which is limited by agreement to 60,000 acre-feet.



- 76) In the Figure 3 example, Allocation Transfers occur regularly, transferring 75% of New Mexico's annual Allotment water occur in any year in which the previous year's negative Accrued Index Departure is greater than 20,000 acre-feet.
- 77) These regular low-magnitude Allocation Transfers have the effect of keeping the Accrued Index Departure above the -80,000 acre-feet Trigger until year 35, while minimizing disruption to EBID Allotments.
- 78) Once the -80,000 acre-feet Trigger is reached, a series of larger Allocation Transfers is initiated, making use of the credit account accumulated from New Mexico's un-used annual Allotment water.
- 79) In years 38 and 48, New Mexico cannot transfer from its credit account due to

the limitations set in the OSA and Implementing Contract, but EEPI compliance is maintained, nevertheless.

- 80) In year 45, the 80,000 AF Trigger is reached again, and another set of large Allocation Transfers is initiated. Forbearance Allocation forms part of the Allocation Transfer in year 49
- 81) Figure 3 shows that the credit account has reached its maximum in year 27. Whenever the credit account is at its maximum value, any annual Allotment water that New Mexico does not Transfer or use elsewhere, automatically increases the water available to EBID farmers.
- 82) Depletion Reduction is a 10-year process, and therefore in early years New Mexico will not have all of the annual Allotment water available for Allocation Transfer that is shown in Figure 3.
- 83) Based on my evaluation and analysis of the EEPI methodology, it is my professional opinion that the Compact Decree and the EEPI methodology provides a workable and comprehensive system for ensuring that both New Mexico and Texas have fair access to the water apportioned to them by the Rio Grande Compact.
- 84) Based on my evaluation of the OSA, and my knowledge and analysis of historical and recent Project Operations, it is my opinion that the OSA,
 - a) Improves Project Allocation and Project Accounting in a way that increases

the Project Allocation to the New Mexico District, addressing New Mexico concerns, and is compatible with the EEPI methodology, and

- b) Provides a workable, cooperative framework for Allocation Transfers that will address EEPI over-delivery (positive Accrued Index Departures) and under-delivery (negative Accrued Index Departures) issues.

85) Based on my evaluation of the GSA, and my knowledge and analysis of historical water use, groundwater conditions, and groundwater-surface water interaction, I conclude that the GSA,

- a) Provides an amount of Depletion Reduction that is reasonable and consistent with the D2 Period baseline condition that underlies the Compact Decree and Project Allocation.
- b) Provides reasonable monitoring of aquifer storage conditions and surface water delivery efficiency conditions using valid and useful measures of those conditions, and
- c) Provides for New Mexico water rights administration under an LRG Plan, that may be necessary if climatic conditions and water supply conditions make it difficult for to comply with the EEPI, or cause groundwater and surface water delivery conditions to degrade.

86) Collectively, the commitments in the GSA are intended to reduce depletions to roughly that which occurred during the D2 Period and to achieve stable or

gaining aquifer levels when CAB3 is above 400,000 acre-feet, while allowing continuing groundwater use within New Mexico, including irrigation well pumping to supplement Project deliveries, including during multi-year drought conditions

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct. Executed this 29th day of August, 2025, at Santa Fe, New Mexico.

Margaret Barroll

Margaret Barroll, Ph.D.

Margaret (Peggy) Barroll, Ph.D.
Senior Water Resource Hydrologist

Professional Resume

Peggy Barroll
691 East Zia Rd
Santa Fe, NM 8750

Phone: (505) 660 8079
pbarroll@gmail.com

Education:

Ph.D. Geophysics, with concentration in groundwater hydrology, 1989, New Mexico Tech, Socorro, New Mexico. Dissertation: "Analysis of the Socorro Hydrothermal System, Central New Mexico"

M.S. Geophysics, 1984, New Mexico Tech, Socorro, New Mexico

B.A. Physics, Honors, 1980, Swarthmore College, Swarthmore Pennsylvania

Award: 2020 New Mexico Earth Sciences Achievement Award

Employment:

2020-Current: Principle: Peggy Barroll, Water Resources Consultant

Fall 2017 -2019: Balleau Groundwater Inc. and West Consultants Inc. --
Senior Water Resource Hydrologist

1991 – 2017: New Mexico Office of the State Engineer -- Senior Water
Resource Hydrologist 1988-1991: D.B. Stephens and Associates -- Hydrologist
(part-time)

Relevant Expertise:

**1) Computer model development and effective model use for
scientific evaluation of hydrogeologic systems**

a. New Mexico Administration: Lower Rio Grande Basin

**i. Principal scientist in the development of multiple
MODFLOW groundwater models for the Lower Rio
Grande (LRG) aquifers**

**1. Development of farm budgets and groundwater
pumping inputs for these groundwater models**

**2. Committee member of modeling experts for 2007 LRG
Groundwater Model**

**ii. Completed in depth analysis of irrigation water demand and
water use through**

1. Analysis of well meter data
2. Calculation of irrigation well pumping for periods prior to well metering
- iii. Provided hydrogeologic consultation to developers of models to simulate Rio Grande Project operations
- iv. Provided hydrogeologic consultation to developers of salinity models
- v. Created compilations of hydrologic data: groundwater pumping, groundwater levels, surface water flows, etc.
- vi. Testifying Expert in the Consumptive Irrigation Requirement Determination in the Lower Rio Grande adjudication
 1. Prepared technical exhibits for Adjudication Court related to irrigation water use
- b. New Mexico Administrative Middle Rio Grande Basin
 - i. Principal scientist in the revision of the pre-existing USGS Middle Rio Grande groundwater MODFLOW model for determination of impairment in Office of the State Engineer (OSE) water right application proceedings
 - ii. Collaborated with the United States Geological Survey (USGS) in development of updated groundwater MODFLOW model of Middle Rio Grande Basin
- c. Taos Valley
 - i. Principal scientist for the OSE in the development and refinement of the Taos Valley MODFLOW groundwater model
 - ii. Collaborated with multi-agency Technical Committee (Federal, State and local representatives) on the creation and calibration of the Taos Valley MODFLOW groundwater model and associated processing tools
 - iii. Technically sound consultation and work product for assistance in the Taos adjudication settlement negotiations
- d. Pecos River Basin
 - i. Principal scientist for the OSE in the development, calibration, application and update of the Carlsbad Area Groundwater MODFLOW model and associated creation of preprocessing software necessary to initiate model runs
 - ii. Senior scientist for the OSE collaborating in the development, application and update of the Roswell-Artesian

Basin Groundwater MODFLOW model

- iii. Senior scientist for the OSE collaborating in the development of RiverWare model of the Pecos River
- iv. Senior scientist for the OSE in the development, support and technical management the Pecos Decision Support System (PDSS). The PDSS is comprised of four independent models, the Carlsbad Area Groundwater MODFLOW model, the Roswell-Artesian Basin Groundwater MODFLOW model, the Pecos River RiverWare Model, and a water balance model of the Pecos River from Carlsbad, NM to the New Mexico-Texas state line. The PDSS was developed to inform negotiators of the Pecos River Settlement Agreement of the impacts of various proposals for New Mexico's compliance with the United States Supreme Court's Amended Decree from Original Action No. 65

2) Groundwater resources development, management and protection

a. Lower Rio Grande

- i. Analysis of Rio Grande Project Operations, historical and present, within New Mexico and Texas
- ii. Utilized the application of models to provide the SE information on historic and proposed Lower Rio Grande water management issues
- iii. Provided technically sound consultation and work product in the development of administrative guidelines, and proposed rules for the Lower Rio Grande within the OSE's jurisdiction
- iv. As the Principal scientist, provided technical evaluation and input on District Specific Rules developed under the OSE's framework rule set for the State of New Mexico's Active Water Resource Management
- v. Engaged with stakeholders from the Lower Rio Grande region on the development of rules for alternative administration of water rights in the OSE's jurisdiction and provided multiple presentations on the 2008 Operating Agreement and associated Operations Manuals
- vi. Acted as technical expert in litigation regarding Rio Grande Project operations
- vii. Acted as technical expert in litigation and mediated settlement negotiations associated with TX v NM #141 orig.

- b. Middle Rio Grande
 - i. Development of State Engineer Water Right Application Guidelines for the Middle Rio Grande Administrative area
 - ii. Guideline technical basis stemmed from groundwater water modeling
 - iii. Determined Critical Management Areas where groundwater pumping is constrained to ensure limits of aquifer drawdown
- c. Pecos
 - i. Acted as technical expert witness in litigation related to Intrepid Potash LLC's proposed reanimation of large, abandoned surface water rights in southern New Mexico.
- d. Miscellaneous assignments as Principal scientist for New Mexico Office of the State Engineer
 - i. Hydrologic assessments for pending water right applications.
 - ii. Hydrologic assessments for adjudications, subdivision water availability determinations
 - iii. Technically sound consultation and work product for SE consideration in water resource management and supervision
 - iv. Technically sound consultation and work product for the Office of the State Engineer litigation activities, including interrogatory questions and responses, technical memoranda, exhibits and expert reports, written and oral testimony

Attachment 2, Barroll Declaration 8/29/2025

D2 Baseline Consumptive Use in New Mexico LRG: 2008-2017 Compared with the D2 Period (1951-1978)

Margaret (Peggy) Barroll 8/2025

Agricultural Consumptive Use (CU) of Irrigation Water:

Consumptive Use is calculated as the product of the Consumptive Irrigation Requirement (CIR, New Mexico Expert determinations) and the total irrigated acreage. Irrigated acreage values for the D2 period irrigated acreage are based largely on Project records. Recent irrigated acreage values are based on remote sensing analysis. All quantities represent the average values for the associated time period.

Table 1. Change in Consumptive Use of Irrigated Agriculture			
Years	Average Total NM Irrigated Acreage in LRG (including both EBID assessed and non-EBID, groundwater-only acres)	Average CIR AF/Acre	Annual Consumptive Use of Applied Water: Acreage * CIR
D2 Period: 1951-1978	88,100 acres	2.60	229,500 AF
2008-2017	76,200 acres	3.00	228,700 AF
Increase in CU			-800 AF

Consumptive use associated with irrigated agriculture in the New Mexico LRG has not increased since the D2 period. Currently, the amount of net fallowing that had occurred since the D2 period has compensated for the increased CIR of current crops.

Domestic, Commercial, Municipal and Industrial (DCMI) Net Consumptive Use

The net consumptive use associated DCMI pumping is calculated by adjusting DCMI pumping by the estimated return-flow percentage (33.34%, based on measured and estimated effluent discharge to Rio Grande and return flow to the aquifer.)

Table 2. Change in Consumptive Use by DCMI uses		
Years	Average Annual DCMI Pumping in Rincon/Mesilla Basins (NM Only)	Net CU (= Pumping *0.6666)
1951-1978	12,200 AF	8,100 AF
2008-2017	40,100 AF	26,700 AF
Increase in CU		18,500 AF

Recent Pumping data obtained from LRG Water Master Records, omitting pumping from Jornada del Muerto basin. Return flow estimate of 33.34% does not include the additional return flow associated with Jornada del Muerto pumping used in the Mesilla Basin.

The consumptive use of water associated with NM LRG DCMI use has increased by approximately 18,500 AF/yr.

SIGNATURE CERTIFICATE



REFERENCE NUMBER

C69B26FD-C356-4392-9FCF-574C921013E7

TRANSACTION DETAILS

Reference Number

C69B26FD-C356-4392-9FCF-574C921013E7

Transaction Type

Signature Request

Sent At

08/29/2025 01:38 PM EDT

Executed At

08/29/2025 01:48 PM EDT

Identity Method

email

Distribution Method

email

Signed Checksum

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Signer Sequencing

Disabled

Document Passcode

Disabled

DOCUMENT DETAILS

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20250829 Barroll Declaration 10 AM

Filename

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SIGNERS

SIGNER	E-SIGNATURE	EVENTS
Name Margaret Barroll Email pbarroll@gmail.com Components 1	Status signed Multi-factor Digital Fingerprint Checksum 4f53cda18c2baa0c0354bb5f9a3ecbe5ed12ab4d8e11ba873c2f11161202b945 IP Address 65.19.46.186 Device Chrome via Windows Typed Signature Margaret Barroll Signature Reference ID 8381765B	Viewed At 08/29/2025 01:44 PM EDT Identity Authenticated At 08/29/2025 01:48 PM EDT Signed At 08/29/2025 01:48 PM EDT

AUDITS

TIMESTAMP	AUDIT
08/29/2025 01:38 PM EDT	Kaleb Brooks (kbrooks@spencerfane.com) created document '20250829_Barroll_Declaration_10_AM.pdf' on Firefox via Windows from 50.227.182.78.
08/29/2025 01:38 PM EDT	Margaret Barroll (pbarroll@gmail.com) was emailed a link to sign.
08/29/2025 01:44 PM EDT	Margaret Barroll (pbarroll@gmail.com) viewed the document on Chrome via Windows from 65.19.46.186.
08/29/2025 01:48 PM EDT	Margaret Barroll (pbarroll@gmail.com) authenticated via email on Chrome via Windows from 65.19.46.186.
08/29/2025 01:48 PM EDT	Margaret Barroll (pbarroll@gmail.com) signed the document on Chrome via Windows from 65.19.46.186.

EXHIBIT 9

DECLARATION OF GREGORY K.
SULLIVAN, P.E., IN SUPPORT OF JOINT
MOTION OF THE STATE OF TEXAS, STATE
OF NEW MEXICO, AND STATE OF
COLORADO FOR ENTRY OF COMPACT
DECREE SUPPORTING THE RIO GRANDE
COMPACT (WITH ATTACHMENT)

No. 141, Original

In the

SUPREME COURT OF THE UNITED STATES

STATE OF TEXAS,

Plaintiff,

v.

STATE OF NEW MEXICO and STATE OF COLORADO,

Defendants.

OFFICE OF THE SPECIAL MASTER

DECLARATION OF GREGORY K. SULLIVAN, P.E.

**IN SUPPORT OF JOINT MOTION OF THE STATE OF TEXAS, STATE OF
NEW MEXICO, AND STATE OF COLORADO FOR ENTRY OF COMPACT
DECREE SUPPORTING THE RIO GRANDE COMPACT**

August 29, 2025

I, Gregory K. Sullivan, P.E., hereby declare as follows:

1. I am over 18 years of age and have personal knowledge of the information stated herein. I am competent to testify to the matters herein. If called to testify, I can and will testify in accordance with the following.
2. I am a disclosed expert in this case.
3. I have a Bachelor of Science degree in Civil Engineering from Colorado State University (1985), and a Master of Science degree in Civil Engineering from the University of Colorado, Denver (1990).
4. From 1985 until 1990, I was employed as a water resources engineer by J.W. Patterson and Associates in Denver, Colorado.
5. From December 1990 to the present, I have been employed by Spronk Water Engineers, Inc. ("SWE") in Denver, Colorado. My current position at SWE is President and Senior Water Resources Engineer.
6. Throughout my career with SWE, I have served as a primary consultant to numerous water providers in the areas of water supply planning and water rights engineering. In that role, I have been responsible for technical analyses supporting changes of water rights, exchanges, augmentation plans, and other water right matters.
7. I have led the development of complex surface water operations models that simulate water demands and how those demands may be met by available water supplies and water rights. On behalf of the State of Kansas, I operated and maintained the Hydrologic-Institutional Model of the Arkansas River Basin that supported Kansas' successful original action lawsuit in *Kansas v. Colorado* in the U.S. Supreme Court (No. 105 Original), and I provided expert testimony in that role before the Special Master in that case. Since 1996, I have served on the Eastern Snake Hydrologic Modeling Committee that guides the development and use of a regional ground water model of the Eastern Snake River Plain Aquifer in Idaho.
8. I have been accepted by various courts as an expert in water resources engineering, water rights engineering, hydrologic modeling, groundwater

modeling, hydrology, water measurement, evaluation of beneficial use, and data analysis.

9. My professional involvement with Lower Rio Grande issues in New Mexico and Texas began in 1999 and my work has involved, among other things:
 - a. Compilation and review of hydrologic and water use data in the Lower Rio Grande area.
 - b. Development of a surface water database that supports New Mexico's technical analyses and hydrologic modeling.
 - c. Development of canal and farm budget models of the irrigation systems of the Rio Grande Project ("Project"), the Hudspeth County Conservation and Reclamation District No. 1, and the Juarez Irrigation District in Mexico.
 - d. Review and analysis of the 2008 Operating Agreement ("2008 OA") for the Project.
 - e. Review and analysis of historical Project operations.
 - f. Development of the Integrated Lower Rio Grande Model ("ILRGM") described below.
 - g. Use of the ILRGM to analyze the claims and counterclaims of the parties to this case.
 - h. Review of technical analyses and modeling submitted by experts for the State of Texas and the United States.
 - i. Litigation support for New Mexico counsel.
 - j. Use of the ILRGM to evaluate the proposed settlement terms.
10. My curriculum vitae is attached.

Proposed Compact Decree

11. The proposed Compact Decree establishes an index-based methodology termed the Effective El Paso Index (“EEPI”) for computing and accounting New Mexico’s annual delivery to Texas consistent with the equitable apportionment of water between Texas and New Mexico downstream of Caballo Reservoir under the Rio Grande Compact. Appendix 1 to the proposed Compact Decree contains technical information related to the EEPI methodology and accounting.
12. On behalf of New Mexico, I participated as a member of the technical review and support committee that assisted New Mexico’s counsel in review and evaluation of the 2022 proposed Consent Decree and supporting EEPI appendix. I worked closely with counsel on evaluating the EEPI methodology and data supporting the calculations for the EEPI methodology. I have also assisted New Mexico with modeling evaluations of the States’ final Compact Decree. The statements in this declaration are my opinions and derived from my direct involvement in evaluating the Compact Decree and supporting materials through ILRGM simulations.
13. Key provisions of the proposed Compact Decree and the EEPI methodology are described in concurrent declarations prepared by New Mexico expert, Dr. Margaret Barroll and by Texas expert, Dr. William R. Hutchison. I have reviewed the declarations of Dr. Barroll and Dr. Hutchison and agree with their descriptions of the EEPI methodology.

Effective El Paso Index Derived from D2 Period Data (1951-1978)

14. The EEPI was derived based on analysis of historical Project operations during the D2 Period from 1951-1978. This is the same period that was used by Reclamation to derive the D1/D2 method of Project allocation. From 1979 – 2005, Reclamation used the D1/D2 method to determine annual Project allocations to EBID and EPCWID. Since 2005, the annual Project allocation to EPCWID has continued to be based on the D1/D2 method, while the Project allocation to EBID was changed by Reclamation to the different method described in the 2008 OA.
15. Since the EEPI was developed using data from the D2 Period, both the D1/D2 method for allocating Project water and the EEPI reflect the same D2 “Baseline” Condition. This Baseline Condition effectively incorporates the

historical effect on Project deliveries and Rio Grande flows resulting from New Mexico pumping in the Rincon and Mesilla basins and Texas pumping in the Texas portion of the Mesilla basin during the D2 Period.

EEPI Departures

16. There are various factors that will prevent the Index Delivery from matching the Index Obligation each year resulting in positive and negative Index Departures. Factors that will contribute to Index Departures include the following:
 - a. Changing river conditions between Caballo Reservoir and the El Paso gage caused in part by variations in surface water and groundwater uses by New Mexico and Texas water users.
 - b. EPCWID carrying over portions of its Project allocation in the current year for delivery in subsequent year(s).
 - c. Variations in return flows that accrue upstream of the El Paso Gage during the non-release season.
 - d. Use of release accounting when only one District is ordering Project water.
 - e. Other differences between the EEPI accounting and Project accounting.
17. In consideration of the above factors, the proposed EEPI methodology allows for departures between the annual Index Deliveries and annual Index Obligations provided that the accrued Index Departures remain within certain limits.
18. The accrued Negative Departure limits of 150,000 acre-feet during the first five years and 120,000 acre-feet thereafter are necessary to accommodate potential Index Departures that may result from the factors listed above, many of which are not within New Mexico's control.
19. The accrued Negative Departure limits of 150,000 acre-feet during the first five years and 120,000 acre-feet thereafter are relatively small considering the amounts of water that are typically delivered to Texas.

20. The EEPI methodology should result in annual Index Obligations to Texas that will on average be consistent with the average annual deliveries to Texas during the D2 Period under similar hydrologic conditions.
21. The changes to Project accounting that are described in the proposed Operations Settlement Agreement should result in Project allocations and deliveries to EPCWID that are more consistent with the computed Index Obligations.
22. For the reasons described above, implementation of the EEPI will result in positive and negative annual and accrued Index Departures. To keep accrued positive and negative departures within reasonable limits, transfers of Project allocation from one district to the other may be needed from time to time. Details of the proposed allocation transfers are described in the Barroll declaration.

Simulation of the EEPI Using the New Mexico ILRGM

23. The New Mexico experts developed a linked surface water – groundwater model of the Lower Rio Grande area from Elephant Butte Reservoir in New Mexico to Fort Quitman, Texas, known as the Integrated Lower Rio Grande Model (often referred to as ILRGM), that was used to help support New Mexico’s positions in the litigation. The ILRGM consists of a RiverWare model that simulates operation of the reservoirs and canal systems of the Rio Grande Project, and which is linked to two MODFLOW groundwater models of the Rincon-Mesilla aquifer and the Hueco Bolson aquifer. A map showing the geographic areas simulated in the ILRGM is provided in the attached **Figure 1**.
24. The ILRGM was recently modified to simulate the key elements of the EEPI described in the proposed Compact Decree.
25. The modified ILRGM was used to project the effects of implementation of the EEPI methodology during a 78-year projection period containing a varied mix of dry, average, and wet years. The simulated hydrologic inputs were from 1940 – 2019, excluding the extremely wet years of 1941 and 1942 that resulted in a spill of Project storage. By excluding these years, the early decades of the simulation period test the EEPI methodology under a long period of generally drier than average conditions.

26. For the projection simulation, the irrigated area, municipal pumping, and starting groundwater storage and reservoir storage were set at current levels. Consistent with the proposed Groundwater Settlement Agreement, 9,240 acres of irrigated land in New Mexico were assumed followed.
27. The results from the EEPI projection run are summarized below in **Figure 2 - Figure 7**. These results show that through groundwater management and allocation transfers New Mexico can manage the Index Departures to comply with the accrued departure limits and other EEPI requirements described in the Compact Decree under varying hydrologic conditions.
28. **Figure 2** shows the simulated annual Index Obligations (black line) and Index Deliveries (orange line) during the 78-year projection period. The plotted results show that the Index Deliveries generally track the Index Obligations with slight or modest over-deliveries and under-deliveries from year to year. Index Deliveries and Index Obligations are not shown for the simulated spill years, nor for the years with annual Caballo Reservoir releases less than 200,000 AF.

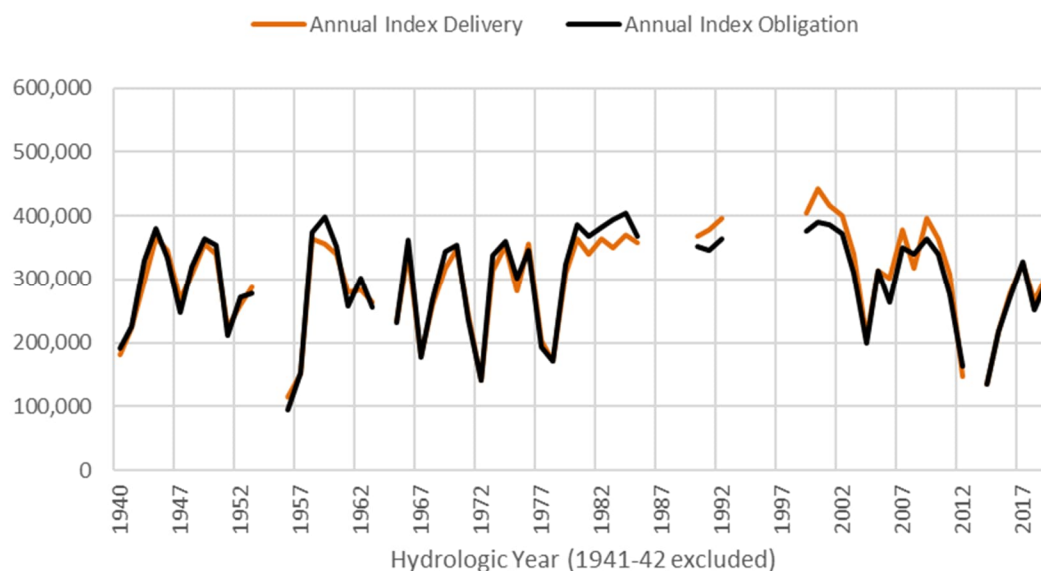


Figure 2: Annual Index Obligation and Index Delivery (acre-feet)

29. **Figure 3** shows the accrued Index Departures (red line) during the simulation. Accrued Index Departure resetting events are indicated by the pink and blue dots near the top of the chart. A pink dot indicates a reset of the accrued Index Departures because of a Project spill and a blue dot indicates a reset of the accrued negative Index Departures because the

three-year average EPCWID carryover exceeded 180,000 acre-feet. In general, the proposed land fallowing in New Mexico and allocation transfers from EBID to EPCWID are effective in managing the accrued departures to stay within the maximum accrued negative departure limits (-150,000 AF during years 1-5 and -120,000 AF thereafter).

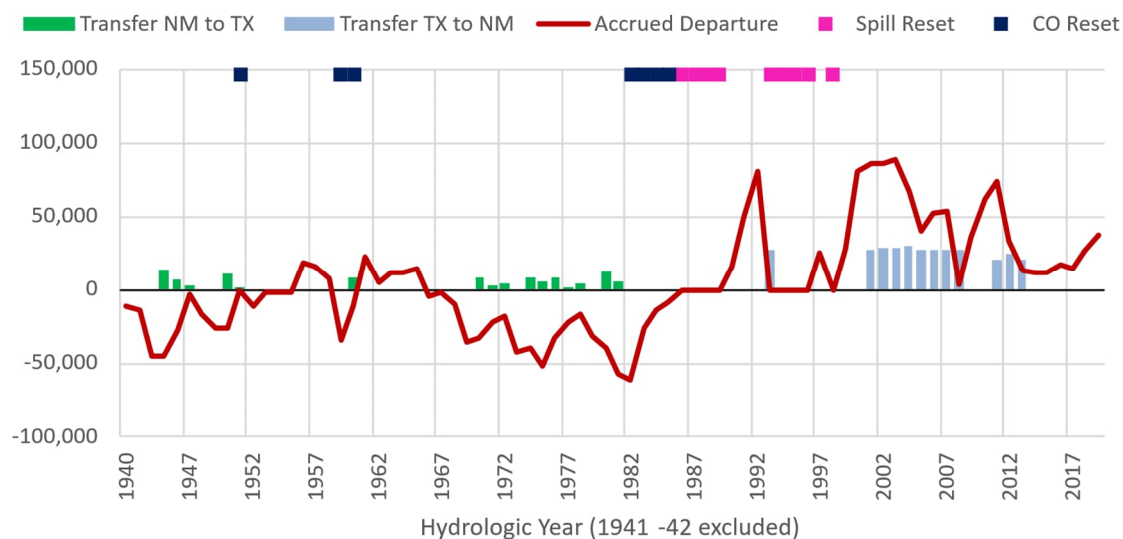


Figure 3: Accrued Index Departures and Annual Allocation Transfers (acre-feet)

30. **Figure 4** shows the simulated annual deliveries to EPCWID and EBID during the Caballo Reservoir release season over the 78-year projection period. The simulated annual deliveries to EPCWID fully meet EPCWID's demand for up to 43% of the available Project supply computed using the D2 equation developed from data during the D2 Period (1951-1978). The remaining 57% of Project supply is available to meet New Mexico water demands simulated at slightly less than the D2 Period average. The New Mexico demands are satisfied through Project deliveries either as farm headgate deliveries of surface water or via pumped groundwater. Overall, considering use of groundwater and surface water, the 57/43 division of water from the D2 Period can generally be met using the EEPI.

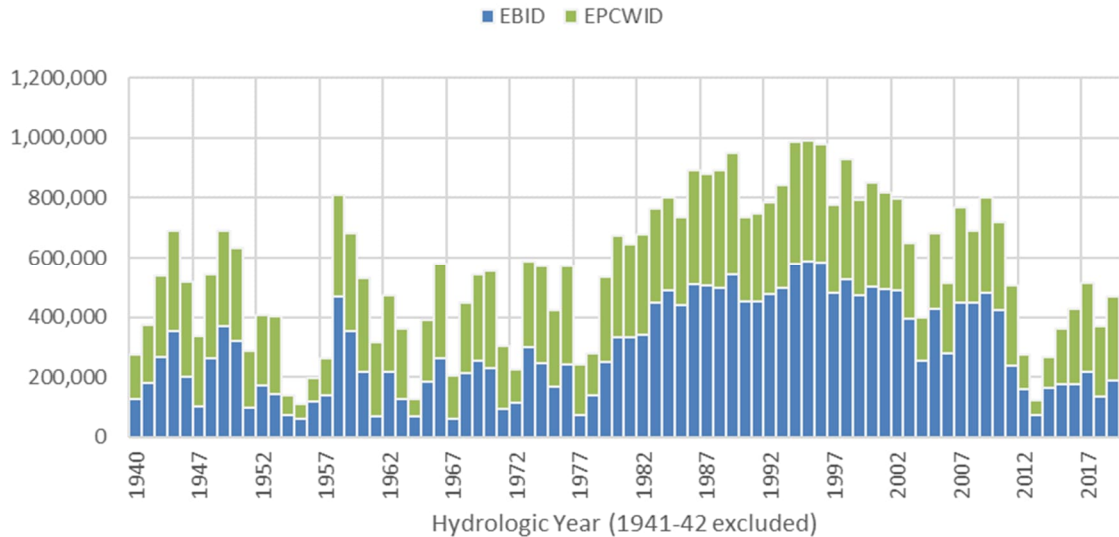


Figure 4: Annual Deliveries of Project Water (RHG) (acre-feet)

31. **Figure 5** shows the simulated alluvial aquifer storage relative to aquifer conditions in 2005. The simulated aquifer storage decreases during dry periods with heavy pumping and recovers during wet periods with less pumping and more recharge from surface water irrigation. Despite the ups and downs through the study period, the aquifer storage remains relatively stable with ending storage similar to the beginning storage.

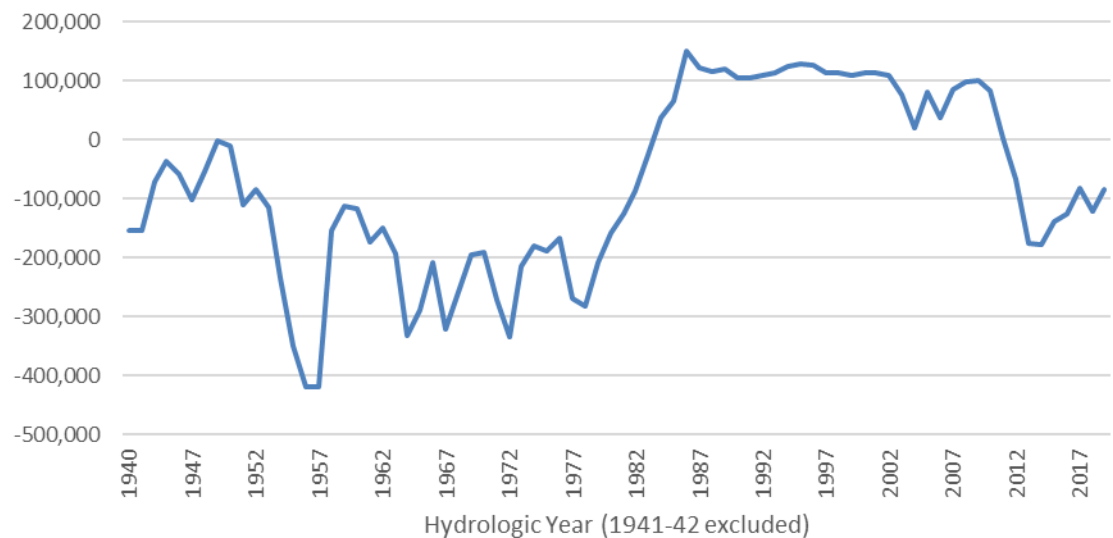


Figure 5: Rincon-Mesilla Alluvial Aquifer Storage (relative to 2005) (acre-feet)

32. The proposed Groundwater Storage Agreement provides for monitoring of two hydrologic conditions going forward; the UVDR3 and the Aquifer Storage Loss defined as follows:

- a. UVDR3 is computed using three-year totals for each of the elements in the numerator and denominator of the Upper Valley Diversion Ratio (“UVDR”) equation:

$$UVDR = \frac{\left(\begin{array}{l} \text{Total Project Diversions above El Paso Gage} \\ + \text{Total Flow at the El Paso Gage} \\ + \text{Texas Mesilla DCMI Pumping in Excess of D2} \end{array} \right) - (\text{El Paso Carriage})}{\text{Project Release}}$$

If the UVDR3 falls below 0.79, the parties are to consult to determine whether any remedial actions are necessary.

- b. Aquifer Storage Loss is monitored by tracking the running three-year change in Rincon-Mesilla alluvial aquifer storage compared to the running three-year average Caballo Reservoir release. If the three-year change in groundwater storage is negative when the three-year average Caballo Reservoir release is greater than 400,000 AF, the parties are to consult to determine whether any remedial actions are necessary.
33. **Figure 6** shows the simulated UVDR3 during the 78-year projection period. The results show that the UVDR3 declines to as low as 0.83 during dry periods but does not fall below the 0.79 threshold.

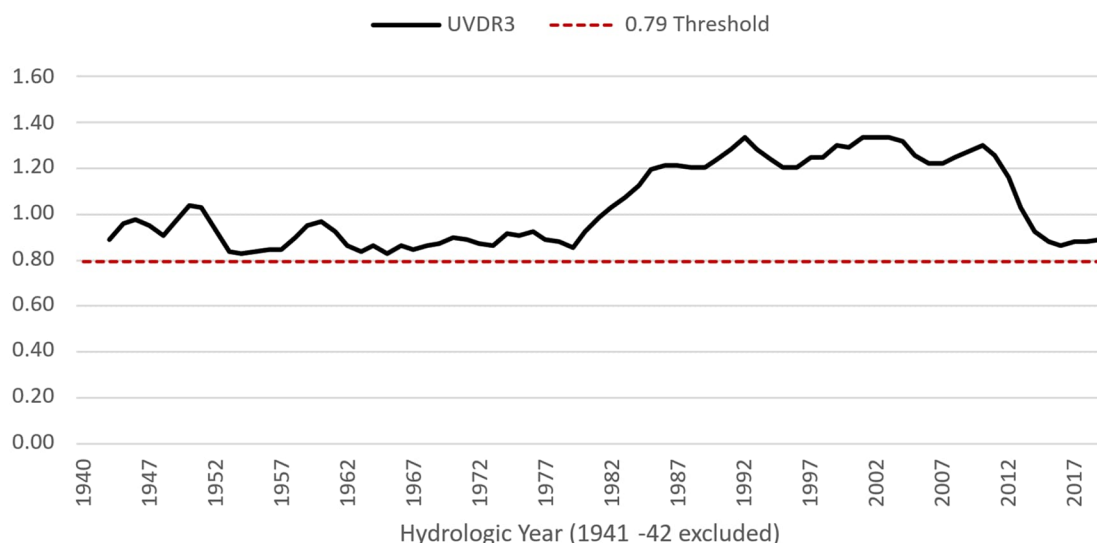


Figure 6: 3-year Upper Valley Diversion Ratio (UVDR3)

34. **Figure 7** shows the simulated Aquifer Storage Loss monitoring condition. The 3-year aquifer storage change is shown as the positive and negative bars. The three-year average Caballo Reservoir release is shown as a black line (read on the second y-axis to the right). The bars are shaded blue when the three-year storage change is negative at the same time that the 3-year average Caballo Reservoir release exceeds 400,000 AF. There are 34 activations of the Aquifer Storage Loss criteria during the 78-year projection period. Most of the activations are either relatively small or occur during times that the aquifer storage begins to decline from a relatively full condition. As such, these conditions are not cause for concern because the simulation shows that the overall aquifer storage is relatively stable over the long term.

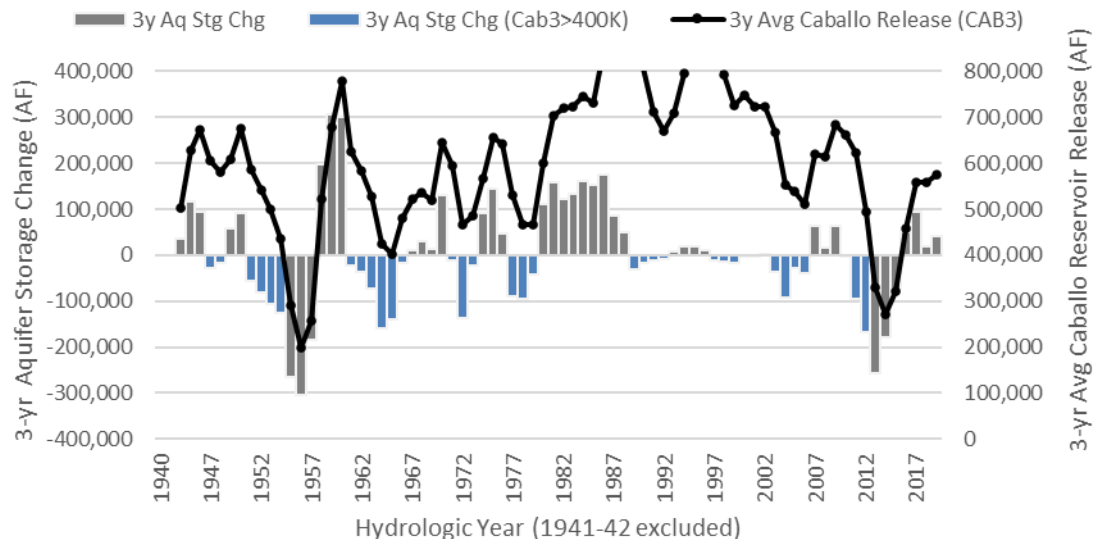


Figure 7: 3-year Alluvial Aquifer Storage Change and 3-year Average Caballo Reservoir Release (acre-feet)

35. The results of the ILRGM simulation of the proposed EEPI methodology and other conditions of the Compact Decree described herein demonstrate that New Mexico can comply with the proposed settlement under the variety of hydrologic conditions that occurred during the historical period from 1940 to 2019.

I declare under penalty of perjury that the foregoing is true and correct.
Executed on **August 29, 2025**.

Gregory K. Sullivan

Gregory K. Sullivan, P.E.

Education: M.S., Civil Engineering, 1990, University of Colorado - Denver
B.S., Civil Engineering, 1985, Colorado State University

Professional Registration: Professional Engineer in Colorado, Idaho, and New Mexico

Professional Experience:

1990 - Present: [Spronk Water Engineers, Inc., President and Senior Water Resources Engineer](#)

Mr. Sullivan has over thirty-five years of experience completing a wide variety of water resources engineering projects. Mr. Sullivan has extensive experience performing historical consumptive use analyses, stream depletions analyses, and reservoir operations studies. Mr. Sullivan serves as the primary consultant to numerous water providers for water supply planning and water rights engineering. In that role, he has been responsible for technical analyses in supporting applications for adjudication of water rights, changes of water rights, exchanges, augmentation plans, and other water right matters. He has led the development of complex surface water operations models that simulate municipal water demands and how those demands may be met by available water supplies and water rights. Mr. Sullivan has served on the Eastern Snake Hydrologic Modeling Committee that guides the development and use of a regional ground water model of the Eastern Snake River Plain Aquifer since 1996. Mr. Sullivan has provided expert testimony in the U.S. Supreme Court, Colorado Water Courts, Snake River Basin Adjudication Court (Idaho), and in administrative hearings before the Idaho Department of Water Resources.

Representative Projects:

[Water Supply Modeling - Texas v. New Mexico and Colorado – Rio Grande Basin](#)

Mr. Sullivan is the lead modeling expert for the State of New Mexico in an active lawsuit filed by the State of Texas in the U.S. Supreme Court concerning alleged violations of the 1938 Rio Grande Compact. Mr. Sullivan is leading a multidisciplinary team of renowned experts from across the country that is analyzing and modeling the historical operation of the Rio Grande Project and the effects of alleged compact violations asserted in the



claims and counterclaims of the parties. The ongoing work includes compilation and analysis of historical data from before the time of the compact to the present, and development of farm budget models of large irrigation systems in New Mexico, Texas, and Mexico. In addition, Mr. Sullivan is coordinating development and use of a linked surface water (RiverWare) and ground water (MODFLOW) models of the Lower Rio Grande area from Elephant Butte Reservoir in New Mexico to Fort Quitman, Texas. The Integrated Lower Rio Grande Model simulates the essential hydrologic and institutional/management processes associated with irrigation and municipal water systems in the study area, including the allocation, operation, and accounting mechanisms of the Rio Grande Project.

Water Supply Modeling - Kansas v. Colorado – Arkansas River Basin

Mr. Sullivan was involved in the refinement and use of the H-I Model of the Arkansas River system in Colorado that was developed to support claims by the State of Kansas that Colorado was violating the terms of the 1948 Arkansas River Compact. The model simulates daily operation of irrigation water uses under approximately two dozen canal systems along the Arkansas River in Colorado between the City of Pueblo and the Colorado-Kansas from 1950 to the present. In addition, the model simulates the operation of sole-source and supplemental irrigation wells, and the impact of those wells on the flow of the Arkansas River. Mr. Sullivan provided expert testimony before a Special Master appointed by the U.S. Supreme Court regarding the use of the H-I Model to evaluate the effects on state line flows resulting from post-compact well development in Colorado.

Injury Analysis - Kansas v. Colorado – Arkansas River Basin

Mr. Sullivan developed a model that was used as part of an analysis to compute the economic impacts and monetary damages to Kansas resulting from the compact violations by Colorado that were determined in the Kansas v. Colorado lawsuit. The model was used to translate monthly depletions to usable stateline flows over a 45-year period into impacts to (a) surface water users in Kansas, (b) to supplemental pumping demands in Kansas and (c) to recharge of the regional ground water system. Mr. Sullivan testified before the Special Master regarding the model development, operation, and results.

Analysis of Replacement Plans - Kansas v. Colorado – Arkansas River Basin

To continue use of post-compact Arkansas River alluvial wells, the well owners in Colorado were required to develop Replacement Plans to offset the impacts of pumping on senior surface water rights in Colorado and on usable stateline flows to Kansas. Mr. Sullivan analyzed the adequacy of these replacement plans through preparation of historical use analyses, water budgets, and other analyses. In addition, Mr. Sullivan used the H-I Model to simulate the effectiveness of the replacement plans in meeting Colorado's delivery obligations under the Arkansas River Compact. Mr. Sullivan provided expert testimony before the Special Master concerning his analyses of the Colorado Replacement Plans.

Change of Water Rights - City of Loveland, Colorado

Mr. Sullivan was the principal investigator for ditch-wide historical use analyses of the major Big Thompson River irrigation ditches that serve lands in and around the City of Loveland. These analyses served as the basis for successful changes of water rights that were approved by the Division 1 Water Court to allow the City to divert its ditch shares at the City's municipal water intakes to help meet its water supply needs. He also guided development of detailed water rights accounting for the City to Mr. Sullivan provided expert testimony in support of the changes of water rights in a contested trial.

Water Supply Yield Modeling - City of Loveland, Colorado

Mr. Sullivan led the development of a model to simulate the daily water supply and demand of the City of Loveland over a study period from 1950 - 2017. The water supplies that are simulated in the model include the ditch shares that have been changed to municipal use, Colorado-Big Thompson Project units, Windy Gap Project units, and the operation of the City's Green Ridge Glade Reservoir. The model is used by the City to evaluate the firm yield of its water supply, and how that yield can be increased through acquisition of additional supplies, development of additional storage, changes in water supply operations and other actions.

Water Supply Planning – ACWWA, Colorado

Mr. Sullivan has provided water resources and water rights consulting for the Arapahoe County Water and Wastewater Authority for over 30 years. ACWWA serves lands in the Cherry Creek basin south of Denver through a

combination of shallow alluvial wells and deep nontributary Denver Basin wells. Water use from these sources is integrated and optimized through operation of a complex plan for augmentation that provides for replacement of out-of-priority depletions to Cherry Creek to protect downstream senior water users. Mr. Sullivan has performed numerous analyses to evaluate the yield of ACWWA's water supplies, including completion of a raw water master plan in 2018.

[Plan for Augmentation - Upper Cherry Creek Water Association, Colorado](#)

Mr. Sullivan was instrumental in the development of an umbrella plan for augmentation for five major water users in the Cherry Creek Basin upstream of Cherry Creek Reservoir. The members have pooled their augmentation sources to replace the combined out-of-priority depletions resulting from alluvial well pumping and out-of-priority storage in Cherry Creek Reservoir. The plan includes an innovative method of computing depletions that considers times when Cherry Creek is dry in the vicinity of the member wells.

[Cherry Creek Aquifer Modeling Project – Colorado](#)

Mr. Sullivan led the development of a basin-wide simulation model of the hydrology and water use in the Cherry Creek basin upstream of Cherry Creek Reservoir. The model simulates the water supplies and water rights of all municipal water providers in the study area and optimizes the alluvial pumping of the water users and the use of Denver Basin ground water replacement supplies. The model also simulates the operation of Cherry Creek Reservoir and Rueter-Hess Reservoir. The model is used by the study participants to evaluate changes in water supply operations and acquisition of new water supplies.

[Snake River Basin Adjudication - Idaho](#)

Mr. Sullivan assisted the City of Pocatello in filing claims to adjudicate water rights as part of the SRBA. This work included historical research of facilities and water uses to document historical flow rates, volumes, and priority dates to assign to the claimed water rights. Mr. Sullivan provided expert testimony before the SRBA Court to help defend the City's claims that were disputed by others.



Snake River Delivery Calls - Idaho

Mr. Sullivan has provided technical analysis and expert testimony to the City of Pocatello in their participation in complex litigation involving water right delivery calls by senior surface water users on the Snake River in Idaho. Pocatello's water supply is derived primarily from junior priority wells that are tributary to the Snake River, and its water supply is threatened by the delivery calls. Mr. Sullivan analyzed the historical operation of seven major irrigation districts that placed the delivery calls to assess the extent of their claimed irrigation water shortages. The irrigation districts serve a combined area of 560,000 acres with annual diversions averaging 3.2 million acre-feet per year. Mr. Sullivan provided expert testimony in several hearings before the Idaho Department of Water Resources.

ESPA Cities Mitigation Plan – Snake River Basin, Idaho

Mr. Sullivan provided technical expertise and analysis in development of a mitigation plan for Pocatello, Idaho Falls, and more than a dozen other cities to mitigate the impacts of municipal groundwater pumping from the Eastern Snake Plain Aquifer in Idaho. The plan relies largely on aquifer recharge to mitigate the impacts of aquifer depletions from pumping that is projected to increase from about 60,000 acre-feet per year to over 120,000 acre-feet per year over the next 50 years.

Division 3 Rules Case - Rio Grande Basin, Colorado

Mr. Sullivan represented a group of surface water right owners that opposed the enactment of administrative rules governing the withdrawal and use of ground water in the Rio Grande Basin in Colorado (Water Division 3). The primary basis for their opposition was that the rules did not provide for mitigation of impacts to a large spring that was the source of their surface water rights and which dried up in conjunction with the large-scale development of ground water irrigation in the area. Mr. Sullivan's work included analysis of the historical irrigation water use by his clients, review of hydrologic data and records, and review of a ground water modeling of the San Luis Valley performed by the State of Colorado. Mr. Sullivan provided expert testimony on behalf of his clients in a trial before the Division 3 Water Court.

Ground Water Administrative Proceeding – Wood River Basin, Idaho

Mr. Sullivan represented the Sun Valley Company and the Cities of Ketchum, Hailey, and Bellevue in an administrative proceeding in the Wood River Valley in Idaho. Holders of senior surface water rights are seeking curtailment of junior ground water rights based on allegations of injury being suffered by the seniors, and the Idaho Department of Water Resources is proposing to implement conjunctive administration of groundwater rights and surface water rights to address the injury claims. A groundwater model of the Wood River Valley developed by IDWR with input from stakeholders is being used in the dispute to assess impacts from pumping on surface water supplies. Mr. Sullivan provided expert testimony on behalf of SVC and the Cities in a contested administrative hearing before the IDWR Director. Mr. Sullivan is also a member of a technical working group that has been assembled to develop a groundwater management plan that is hoped to settle the ongoing dispute.

1985 – 1990:

J. W. Patterson & Associates, Inc., Water Resources Engineer

Performed water supply, hydraulic and hydrologic analyses for agricultural, industrial, commercial, and municipal developments. Managed yield and impact analyses of water rights adjudications, transfers, exchanges and plans for augmentation. Conducted ground water studies including aquifer testing, project dewatering and water well design and construction monitoring.

Continuing Education:

Applied Ground-Water Flow Modeling. International Ground Water Modeling Center, Colorado School of Mines, Golden, CO. March 1993.

Introduction to Simulation Training in RiverWare, Center for Advanced Decision Support for Water and Environmental Systems, University of Colorado, May 2016.



SIGNATURE CERTIFICATE



REFERENCE NUMBER
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TRANSACTION DETAILS

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Transaction Type
Signature Request

Sent At
08/29/2025 11:47 AM EDT

Executed At
08/29/2025 11:49 AM EDT

Identity Method
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Distribution Method
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Signer Sequencing
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DOCUMENT DETAILS

Document Name
Sullivan Declaration rev1

Filename
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Pages
19 pages

Content Type
application/pdf

File Size
2.57 MB

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SIGNERS

SIGNER	E-SIGNATURE	EVENTS
Name Greg Sullivan	Status signed	Viewed At 08/29/2025 11:48 AM EDT
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AUDITS

TIMESTAMP	AUDIT
08/29/2025 11:47 AM EDT	Kaleb Brooks (kbrooks@spencerfane.com) created document 'Sullivan_Declaration_rev1.pdf' on Firefox via Windows from 50.227.182.78.
08/29/2025 11:47 AM EDT	Greg Sullivan (gsullivan@spronkwater.com) was emailed a link to sign.
08/29/2025 11:48 AM EDT	Greg Sullivan (gsullivan@spronkwater.com) viewed the document on Chrome via Windows from 47.199.21.75.
08/29/2025 11:49 AM EDT	Greg Sullivan (gsullivan@spronkwater.com) authenticated via email on Chrome via Windows from 47.199.21.75.
08/29/2025 11:49 AM EDT	Greg Sullivan (gsullivan@spronkwater.com) signed the document on Chrome via Windows from 47.199.21.75.

EXHIBIT 10

DECLARATION OF RYAN J. SERRANO IN
SUPPORT OF JOINT MOTION OF THE
STATE OF TEXAS, STATE OF NEW
MEXICO, AND STATE OF COLORADO FOR
ENTRY OF COMPACT DECREE
SUPPORTING THE RIO GRANDE COMPACT

No. 141, Original

In the

SUPREME COURT OF THE UNITED STATES

STATE OF TEXAS,

Plaintiff,

v.

STATE OF NEW MEXICO and STATE OF COLORADO,

Defendants.

OFFICE OF THE SPECIAL MASTER

DECLARATION OF RYAN J. SERRANO

**IN SUPPORT OF JOINT MOTION OF THE STATE OF TEXAS, STATE
OF NEW MEXICO, AND STATE OF COLORADO FOR ENTRY OF
COMPACT DECREE SUPPORTING THE RIO GRANDE COMPACT**

August 29, 2025

I, Ryan J. Serrano, pursuant to 28 U.S.C. § 1746, hereby declare as follows:

1. I am over 18 years of age and have personal knowledge of the facts stated herein. I am competent to testify to the matters herein. If called to testify, I can and will testify in accordance with the following.
2. I am currently employed by the New Mexico Interstate Stream Commission as the Lower Rio Grande Bureau Chief. In this role I am primarily responsible for the complete management and oversight of the Interstate Stream Commission's administrative, institutional, legislative, technical/engineering activities and policies related to the Lower Rio Grande (LRG) in New Mexico. This includes providing technical oversight and expertise to guide effective water resources management and to support the Interstate Stream Commission's Rio Grande Compact activities in the LRG.
3. Prior to my current position, I was the LRG Water Master for the Lower Rio Grande Water Master District (LRG Water Master District) with New Mexico Office of the State Engineer (OSE) Water Rights District Office in Las Cruces (District IV) from May 12, 2012 through October 14, 2023.
4. Prior to my position as LRG Water Master, I was an Assistant Lower Rio Grande Water Master with OSE in District IV, a position I held from June 27, 2009 until my promotion to the LRG Water Master in 2012.
5. I earned my Bachelor of Science degree in Geography, with a minor in Geographic Information Systems, from New Mexico State University in May 2009.
6. Since 2013, I have participated in Texas v. New Mexico, No. 141. I was disclosed as a witness for New Mexico in 2019. My deposition was taken on February 16, 2019 and April 17, 2019, and my first Declaration was filed with the court on December 22, 2020. I was designated as a trial witness and testified at the first phase of the bifurcated trial on November 9, 2021.
7. Throughout the course of this litigation and settlement discussions, I have been directly involved in multiple capacities, including discovery and

disclosure of evidence, basin tours, testimony, mediation, and settlement negotiations. This declaration focuses on New Mexico's ability to administratively implement the terms and conditions of the settlement agreements.

A. WATER ADMINISTRATION IN THE LOWER RIO GRANDE BASIN:

1. All water rights in New Mexico must comply with state water statutory requirements, as well as State Engineer's regulations, permits, licenses, and orders. NMSA 1978, § 72-2-18. State statutes allow the State Engineer to issue Compliance Orders, hold hearings, and file civil actions against offenders. Id.
2. The State Engineer issued an Order declaring the LRG Underground Basin in 1980 and expanded it in 1982. JT-EX 467 and 468. The OSE has not permitted any new appropriations of groundwater in the Mesilla or Rincon basins within the LRG without requiring offsets of expected Rio Grande depletion effects.¹
3. The State Engineer issued an Order in 2004 establishing the LRG Water Master District and LRG Water Master. NM-EX 429, In the Matter of the Creation of the Lower Rio Grande Water Master District Order No. 169, (12-3-2004) (Water Master Order #169).
4. The OSE District IV office in Las Cruces administers water rights for the Lower Rio Grande. There are numerous State Engineer Orders and guidelines which the OSE District IV office is responsible for implementing and enforcing.
5. The State Engineer issued a Metering Order in 2004 (later amended and supplemented). The OSE District IV office is responsible for enforcing this Order and requires metering on all wells (other than single-family wells and small stock wells). NM-EX 433, State Engineer Supplemental Order No. 180 (3-28-2007) (Final Metering Order). As of 2020 there were approximately

¹ As identified in R. Serrano's previous declaration (December 22, 2020), there are three trivial exceptions that upon further investigation were not post-basin rights.

3,000 actively metered irrigation, municipal, commercial and industrial wells in the LRG.

6. The LRG Water Master ensures compliance with the New Mexico Water Code, well permits and licenses issued by the State Engineer, orders issued by the LRG adjudication court, and State Engineer orders, regulations, and policy guidance and directives. Water Masters “shall have immediate charge of the apportionment of waters in the water master's district under the general supervision of the state engineer, and the water master shall so ... regulate and control the waters of the district as will prevent waste.” NMSA 1978, § 72-3-2.
7. The LRG Water Master’s primary duties include (but are not limited to): bringing enforcement actions against illegal diversions; measuring and reporting water usage within the LRG Water Master District; preventing out-of-priority diversions; and coordinating with the Bureau of Reclamation and the Elephant Butte Irrigation District (EBID). These duties regulate and control groundwater withdrawals in the LRG Water Master District.
8. The LRG Water Master has several Assistant Water Masters who assist in determining well permit compliance, including diversion limits, place of use or purpose of use, or requirements to retire water use on lands. The Assistant Water Masters also conduct field investigations and inspections of wells, take flow measurements, and analyze aerial photographs and water use records to evaluate historic use of water rights.
9. Within the LRG Basin, there is an ongoing water rights adjudication. An adjudication court order that applies to irrigation water rights in the LRG is the LRG SS101 Adjudication Order. NM-EX 541. That court order establishes the total amount of surface and groundwater that may be used on an acre of land in the LRG. To assure compliance with that order OSE District IV monitors water diversions, place of use and other aspects of water rights affected by LRG SS101. OSE District IV does not measure or limit individual EBID farmer diversions of surface water. That is the responsibility of the Bureau of Reclamation and EBID. NMSA 1978, §§ 73-10-16, -24.
10. Accordingly, every irrigation season Reclamation calculates the Rio Grande Project’s water allocation for the year with input from EBID and El Paso

County Water Improvement District (EPCWID) through an Allocation Committee. The total final allocation is the amount of available Project water for irrigation of Project lands in EBID and EPCWID (and delivery to Mexico). Within New Mexico, EBID then determines the individual allotments to EBID farmers. This allotment may be adjusted based on changes in Project allocation during the irrigation season. The OSE District IV office obtains this surface water allotment information from EBID and inputs it into a database to determine the amount of pumping that will be allowed on authorized acreage for each supplemental groundwater right.

11. In accordance with the SS101 LRG Adjudication Order, OSE District IV is then responsible for calculating allowed groundwater pumping that may supplement individual surface water irrigation rights that receive water stored and diverted as part of the Rio Grande Project within EBID. NM-EX 541. Specifically, OSE District IV inputs EBID members' full surface water allotments and then calculates the allowed groundwater pumping. This determination is a conservative calculation because it assumes all EBID members take delivery of their surface water allotments before using groundwater. NM-EX 541, SS101 LRG Adjudication Order. This conservative calculation limits the amount of groundwater available to EBID members. OSE then calculates how much of each water right owner's 4.5 acre-feet/acre (afa) (or up to 5.5 afa) combined water right may be satisfied by surface water and the diversion of groundwater. This calculation is in compliance with the SS101 LRG Adjudication Order.
12. OSE District IV also tracks all municipal, commercial and industrial use based on meter readings. Municipal, commercial and industrial groundwater use in the LRG (including the unmetered single-family wells and small stock wells use) is approximately 40,000 acre-feet/year afy. See, e.g., NM-EX 540, 2018 WM Report at 17-18.
13. Single-family wells and small stock wells are typically not metered but are only estimated to divert roughly 2,000 - 3,000 acre-feet of water each year in the LRG, and often much of that diverted water returns to the aquifer as return flows. Under the State Engineer's 2006 Domestic Well rules, domestic wells for single-family use are permitted for 1 afy, and if livestock is present the permit may allow for up to 3 afy.

B. OPERATIONS SETTLEMENT AGREEMENT:

1. In the Operations Settlement Agreement, the United States, New Mexico, and EBID agree to seek to amend, no earlier than October 1, 2026 and by no later than January 31, 2027, the SS101 LRG Adjudication Order to:
 - a. Recognize a priority date of 1903 for administrable combined surface and groundwater diversions measured at the farm headgate and groundwater point of diversion of up to 3.024 AF/acre per year for EBID members with administrable, combined surface water and supplemental groundwater rights; and otherwise amend the SSI 101 LRG Adjudication Order as necessary to implement the Groundwater Settlement Agreement (as described further below).
 - b. Based on the Ground Water Settlement Agreement, the OSE District IV office through its Water Master, will administer combined surface water and supplemental groundwater rights within EBID with a priority date of 1903 for diversions at the farm headgate and groundwater points of diversion of up to 3.024 afa. Additional groundwater diverted beyond 3.024 afa, up to 4.5 afa (or 5.5 afa), are considered a primary groundwater right and will be administered a priority date associated with the date of drilling and be subject to the limits set forth in SSI 101 LRG Adjudication Order.
2. Groundwater administration of supplemental and primary groundwater rights within the LRG will continue to be consistent with New Mexico water law; State Engineer regulations, permits, licenses, and orders; and orders entered by an adjudication court or other court of competent jurisdiction.

C. DEPLETION REDUCTION IN GROUNDWATER SETTLEMENT AGREEMENT:

1. In the Groundwater Settlement Agreement between the United States and New Mexico, New Mexico agrees, among other things, to meet certain depletion reduction obligations, as defined in that agreement, through the acquisition and permanent retirement of groundwater rights.

2. Pursuant to the Groundwater Settlement Agreement, New Mexico will reduce depletions in the LRG by 18,200 acre-feet per year within ten (10) years of the Groundwater Settlement Agreement effective date. New Mexico shall meet this Depletion Reduction obligation by permanently retiring groundwater rights to reduce Depletions (as defined in the Groundwater Settlement Agreement) by 18,200 acre-feet per year. Within five (5) years New Mexico will reduce Depletions by a minimum of 9,100 acre-feet per year. New Mexico will be required to maintain the Depletion Reduction obligation as described in the agreement.
3. The ISC and OSE will ensure that the Depletion Reduction occurs within the requirements of the agreement. This includes ensuring that irrigation groundwater rights considered for permanent retirement have been used on the lands a minimum of 5 years out of every moving 10-year period since 2010. Additionally, the groundwater rights must be in good standing with the OSE.
4. Irrigation groundwater rights that were enrolled in New Mexico's LRG Groundwater Conservation Program (GCP) shall be deemed to have been used during the period of enrollment.
5. The purpose of the GCP is to initiate groundwater conservation actions that will ensure that New Mexico has a sustainable groundwater supply. Under the program, financial compensation is awarded to water right owners in the LRG for temporarily conserving groundwater by not irrigating their land for designated periods of time between 12 and 36 months. Since the inception of the program as a pilot project in 2020, there has been robust participation with a total of approximately 11,800 acres of land enrolled, and \$11.2 million in payments issued to participants. As a result of these conservation measures, there have been between 12,000-16,000 acre-feet of groundwater conserved.
6. In my current experience overseeing and implementing the GCP, as a previous LRG Water Master, and with my daily interactions with the staff from OSE District IV, I believe the ISC will achieve the 18,200 afy Depletion Reduction within the 10-year requirement.
7. OSE and ISC will transition the GCP from a temporary retirement program to a permanent retirement program where groundwater rights and the land

following program will serve as the primary mechanism to meet its Depletion Reduction commitments described in the Groundwater Settlement Agreement. OSE and ISC have the structure in place to achieve the 18,200 afy Depletion Reduction within the 10-year requirement.

8. ISC will also ensure that non-irrigation rights considered for permanent retirement have been used a minimum of 5 years out of every moving 10-year period since 2010. ISC will also require that the groundwater rights must be in good standing with the OSE to be eligible.
9. OSE District IV, the LRG Water Master, and the ISC will account for and track all depletions. Each acre of Groundwater-Only Land that is permanently retired shall be deemed to reduce Depletions by 2.6 afy. New Mexico may retire groundwater from Combined-Right Lands to satisfy its Depletion Reduction obligation; and each acre of Combined-Right Land that is retired shall be deemed to reduce Depletions by 1.97 afy. As noted in the agreement, if New Mexico were to meet its Depletion Reduction obligation solely by retiring groundwater on Combined-Right Lands, it would satisfy its obligation by retiring groundwater rights on 9,240 acres.
10. Permanently Retired Lands will be tracked and monitored by the OSE District IV office in both tabular and spatial formats. Groundwater rights associated with Permanently Retired lands will be administratively retired in the OSE's water right database and in records on file in the OSE District IV office. This will ensure no further water rights transactions will occur following permanent retirement of a water right used for Depletion Reduction. Spatially, the Permanently Retired Lands will be cataloged in a Geographic Information System geodatabase and mapped by the OSE District IV office. Periodic field verifications will be conducted to ensure that no improper use of water is occurring on permanently retired lands except as provided for in the Groundwater Settlement Agreement or subsequent permitting through the OSE.
11. The surface water rights from Permanently Retired Lands will not be used on the lands from which they were acquired except for uses incidental to land ownership such as planting a cover crop or nuisance control. Permanently Retired Lands may also be served by a utility, mutual domestic, or other water provider for non-irrigation purposes, provided it results in no net increase in

Depletions. OSE and ISC will track the use of the surface water from the Permanently Retired Lands.

12. New Mexico may also retire non-irrigation groundwater rights to satisfy its Depletion Reduction obligation. Depletion Reduction from non-irrigation groundwater rights shall be calculated as the reduction in consumptive use in any associated with the retirement of those rights. OSE and ISC will use best available evidence to calculate the depletions of groundwater associated with non-irrigation groundwater rights including for example historical aerial photography, records of historical diversions, or historical studies containing evidence regarding water use.
13. The OSE and ISC will prepare an annual report that details the previous calendar year's Permanent Groundwater Retirement for the Depletion Reduction obligation. The annual report will document the groundwater rights that were retired during the previous year, the acreage and calculation of the Depletion Reduction, the total groundwater rights retired since the Effective Date, and any use of the surface water rights associated with Permanently Retired Lands.
14. The annual report will be available as a draft for review and comment by Reclamation no later than the third Friday in February. New Mexico will finalize the annual report no later than the first Friday in April.
15. After New Mexico has satisfied its Depletion Reduction requirements no further annual reports will be required. However, New Mexico will include information in the LRG Water Master's Annual Report on:
 - a. the use of the surface water rights associated with Permanently Retired Lands,
 - b. the continuing non-use of water on Permanently Retired Lands,
 - c. maintenance of the Depletion Reduction obligation, and
 - d. any approved transfers onto Permanently Retired Lands.
16. The LRG Water Master's Annual Report will include the information required by the Groundwater Settlement Agreement described above and identify all administrative action taken under or required by Active Water Resource Management. The report will include a record of total diversions within the LRG, , and any other pertinent issues or aspects of administration within the

LRG Water Master District. The report will also provide such other information as the State Engineer may require.

17. OSE District IV, the LRG Water Master, and ISC will ensure the Depletion Reduction obligation is achieved, the Permanently Retired Lands remain out of production, and the Depletion Reduction obligation is maintained. As described above, the Depletion Reduction calculations will be transparent and consistent with Compact Decree's D2 Period baseline.

D. THIRD-PARTY IMPLEMENTING CONTRACT

1. Under the Miscellaneous Purposes Act Contract (Contract No. 25-WC-40-1028), Reclamation allows for the conversion of up to 100,000 acre-feet per year of irrigation water for other miscellaneous uses and authorizes EBID to enter into Third-Party Implementing Contracts with Third-Party Contractors for the delivery of Project Water for uses other than irrigation, subject to approval by Reclamation.
2. A Third-Party Implementing Contract was entered into between EBID and ISC (Contract No. 25-WC-40-1029). This contract specifies the terms and conditions upon which New Mexico may use up to 50,000 acre-feet per year of Project surface water for EBID Allocation Transfers (as described in the Compact Decree) when New Mexico has Negative Accrued Departures.
3. The Third-Party Implementing Contract allows for four sources of converted water for EBID Allocation Transfers.
 - a. Base Allotment
 - b. Converted Water Credits
 - c. Leased Allotment
 - d. Allocation Forbearance
4. There are a few notable restrictions detailed in the Third-Party Implementing Contract. EBID Allocation Transfers cannot reduce EBID's initial allocation below 100,000 acre-feet. Also, the total amount of Converted Water used for an EBID Allocation Transfer shall not exceed twenty percent (20%) of EBID's Allocation at the time of the transfer. Further, the amount of the EBID Allocation Transfer is the lesser of ISC's available water for the EBID

Allocation Transfer and the Negative Accrued Departure. With regard to EPCWID, EBID Allocation Transfers shall not cause EPCWID's end-of-year Project Allocation balance to exceed its carryover limit (232,915 acre-feet), and EBID Allocation Transfers in excess of 30,000 acre-feet in any one calendar year will require unanimous approval of EPCWID, EBID, and Reclamation.

5. When an EBID Allocation transfer is requested by ISC and Reclamation implements the Transfer, New Mexico's Negative Accrued Departure under the terms of the Compact Decree will be concurrently reduced by an amount equal to the Allocation Transfer.
6. Pursuant to the terms of the Third-Party Implementing Contract, ISC will provide Forbearance Payments to EBID for the amount of EBID's Allocation Forbearance water converted to EBID Allocation Transfer.
7. The Allocation Transfer process under the terms of the Third-Party Implementing Contract will provide a fair and reasonable mechanism for New Mexico to remain in compliance with its Index Delivery Obligations under the Compact Decree.

I declare under penalty of perjury that the foregoing is true and correct.
Executed on **August 28, 2025**.

Ryan J. Serrano

Ryan J. Serrano

SIGNATURE CERTIFICATE



REFERENCE NUMBER
A6B3D05D-7CD6-4103-AA53-71F2B984CE95

TRANSACTION DETAILS

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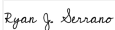
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SIGNERS

SIGNER	E-SIGNATURE	EVENTS
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AUDITS

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08/28/2025 04:18 PM EDT	Ryan J. Serrano (ryan.serrano@ose.nm.gov) was emailed a link to sign.
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08/28/2025 04:42 PM EDT	Ryan J. Serrano (ryan.serrano@ose.nm.gov) authenticated via email on Microsoft Edge via Windows from 164.64.190.57.
08/28/2025 04:42 PM EDT	Ryan J. Serrano (ryan.serrano@ose.nm.gov) signed the document on Microsoft Edge via Windows from 164.64.190.57.

EXHIBIT 11

DECLARATION OF HANNAH RISELEY-
WHITE IN SUPPORT OF JOINT MOTION OF
THE STATE OF TEXAS, STATE OF NEW
MEXICO, AND STATE OF COLORADO FOR
ENTRY OF COMPACT DECREE
SUPPORTING THE RIO GRANDE COMPACT

No. 141, Original

In the
SUPREME COURT OF THE UNITED STATES

STATE OF TEXAS,

Plaintiff,

v.

STATE OF NEW MEXICO and STATE OF COLORADO,

Defendants.

OFFICE OF THE SPECIAL MASTER

DECLARATION OF HANNAH RISELEY-WHITE

**IN SUPPORT OF JOINT MOTION OF THE STATE OF TEXAS, STATE OF
NEW MEXICO, AND STATE OF COLORADO FOR ENTRY OF COMPACT
DECREE SUPPORTING THE RIO GRANDE COMPACT**

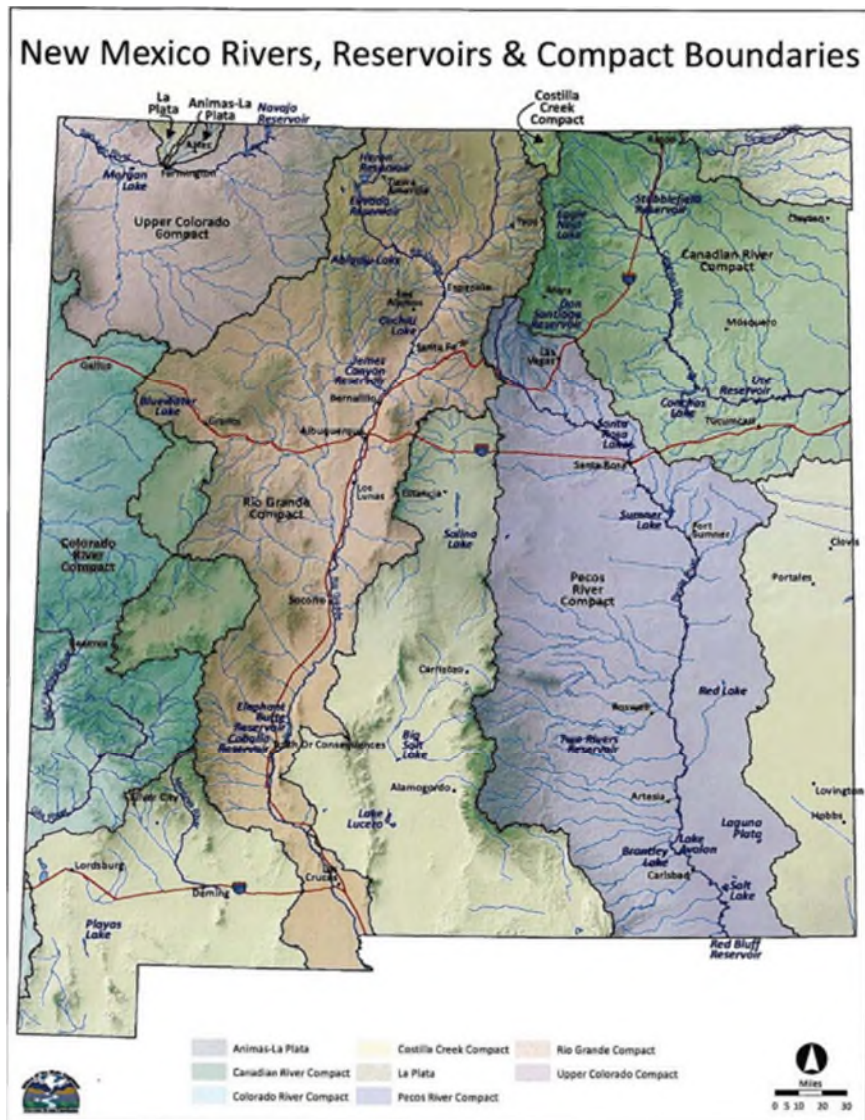
August 29, 2025

I, Hannah Riseley-White, pursuant to 28 U.S.C. § 1746, hereby declare as follows:

1. I am over 18 years of age and have personal knowledge of the facts stated herein. I am competent to testify to the matters herein. If called to testify, I can and will testify in accordance with the following.
2. I earned a Bachelor's degree in Politics from New York University in 1999 and a Master's degree in Environmental Science and Management with a Water Resources Management specialization from U.C. Santa Barbara in 2014.
3. I worked for 12 years for non-governmental organizations in New York City supporting community-managed green spaces. Upon completion of my Master's degree, I was hired by the New Mexico Interstate Stream Commission ("ISC") in 2014 to conduct Pecos River Compact accounting and support compact compliance activities in the Pecos Basin. I then served as ISC Pecos River Bureau Chief between 2016 and 2020, and as ISC Deputy Director from 2020 to 2023.
4. I am currently the Director of the New Mexico Interstate Stream Commission ("ISC"). In this position I supervise ISC staff and implement and execute the ISC's statutory duties to investigate, protect, conserve, and develop the state's water resources, including overseeing efforts to comply with interstate compacts. As the ISC Director I also serve as the Deputy State Engineer. I have held this position since late July of 2023.

The Interstate Stream Commission

5. The ISC was created in 1935. It has broad powers to investigate, protect, conserve, and develop the state's water supplies. Its separate duties include managing and protecting New Mexico's right to water under eight (8) interstate stream compacts and ensuring the state complies with each of those compacts, as well as developing and promoting regional and statewide water planning. A map showing the compacts to which New Mexico is a party is provided below.



6. The ISC is made up of nine members. Eight Commissioners are appointed by the Governor. The ninth Commissioner is the State Engineer, who also serves as the Secretary of the ISC.

7. In addition to compact administration, the ISC is responsible for ensuring compliance with the provisions of United States Supreme Court Decrees governing water allocations. Currently that responsibility includes duties on the Pecos, Canadian, and Gila rivers.

8. The ISC's work in the Rio Grande Basin includes both a Middle Rio Grande Basin Bureau and a Lower Rio Grande Basin ("LRG") Bureau with extensive coordination between the two bureaus to support holistic

management of the overall basin. Over the last two years, the ISC increased staffing in the LRG Basin Bureau from two full-time employees to six, including five based in Las Cruces. The LRG Basin Bureau is also supported by staff from ISC's Office of the General Counsel and Program Support group. The LRG Basin Bureau works extensively with the NM Office of the State Engineer District IV staff and supports a wide range of water management initiatives in the LRG.

9. In fiscal year 2026, the LRG Basin Bureau plans to undertake the following projects:
 - a. Groundwater conservation leasing program
 - b. Groundwater and surface water acquisition program
 - c. Stormwater capture and aquifer recharge assessment
 - d. Supply augmentation or importation evaluation
 - e. Brackish water and re-use evaluation
 - f. Develop accounting for the proposed Compact Decree
 - g. Hydrological studies
 - h. Community outreach and engagement
 - i. United States Geological Survey (USGS) geohydrology and water quality monitoring program
 - j. Support for the NM Office of the State Engineer District IV activities related to the LRG
10. If the Supreme Court enters the Consent Decree Supporting the Rio Grande Compact ("Compact Decree") and the Operations Settlement Agreement, Groundwater Settlement Agreement, and Third-Party Implementing Agreement become effective, the ISC will play a significant role in monitoring and complying with New Mexico's obligations under the Compact Decree.

Depletion Reduction

11. As described by other declarants, New Mexico has an obligation under the Groundwater Settlement Agreement to reduce depletions in the LRG by 18,200 acre-feet over a ten-year period by Permanently Retiring Groundwater.
12. New Mexico has experience with depletion reduction programs for

compact purposes. For example, New Mexico successfully implemented a similar program under settlement provisions on the Pecos River to comply with the Pecos River Compact and a Supreme Court decree requiring state line deliveries. New Mexico successfully retired over 20,000 acres of irrigated farmland within the Pecos River valley. That effort resulted in New Mexico accruing a Pecos River Compact credit of up to 176,000 acre-feet. New Mexico will have the benefit of lessons learned in the Pecos program when it undertakes the Depletion Reduction obligation under the Groundwater Settlement Agreement.

13. In addition, as discussed by Mr. Serrano in his Declaration, New Mexico has a temporary Depletion Reduction program in the LRG known as the Lower Rio Grande Groundwater Conservation Program. The success of that program provides further evidence that New Mexico will be able to satisfy its Depletion Reduction obligation.
14. New Mexico has been evaluating the cost of the Depletion Reduction obligation, and it will be working with the New Mexico Legislature to obtain appropriations beginning in 2026. Such appropriations would represent an investment in the LRG aquifer and the long-term vitality of the region. To date, the State has already appropriated approximately \$60 million to the ISC to begin work on the Depletion Reduction program, in addition to other initiatives to support aquifer sustainability and develop additional sources of supply. In addition, the U.S. Bureau of Reclamation (“Reclamation”) has been a valued partner to New Mexico in the LRG. Even as the litigation was ongoing, ISC was the recipient of a funding award from Reclamation for \$60 million, of which \$40 million can be used to supplement State appropriations to support the Depletion Reduction program.

Enforceable Hydrologic Conditions

15. New Mexico has a longstanding interest in maintaining the Rincon and Mesilla aquifers (“Aquifer”) in the LRG. New Mexico farmers in the LRG historically relied on groundwater in times of drought when Project surface water was short. Then, when increased surface water supplies were available, the Aquifer would recover. This created an equilibrium that maintained the Aquifer at a sustainable level.

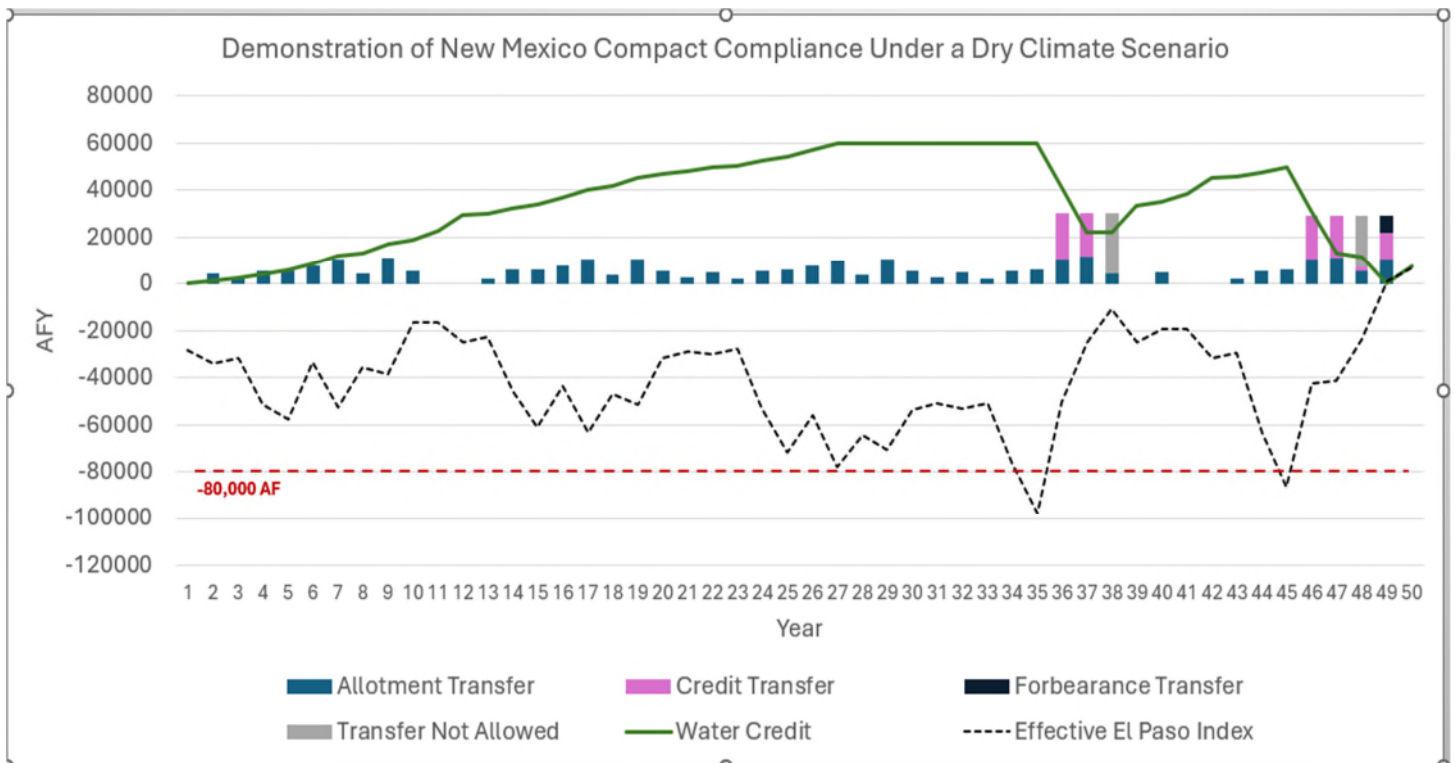
16. One of the issues New Mexico raised with the 2008 Operating Agreement in this litigation is that it deprived Elephant Butte Irrigation District (“EBID”) farmers of surface water and forced them to rely more heavily on groundwater. Groundwater monitoring by the ISC showed significant declines in groundwater levels in the LRG that upset the hydrologic equilibrium. The Groundwater Settlement Agreement and changes to Project operations in the Operations Settlement Agreement should help to address these issues.
17. Another reason that New Mexico agreed to the Enforceable Hydrologic Conditions is that when water levels decline in the Aquifer, or there is significant storage loss, it causes some Rio Grande water to be lost to the Aquifer as it travels towards Texas. Poor conditions in the Aquifer therefore not only have implications for New Mexico farmers but would also make it more difficult for New Mexico to meet its Index Obligation under the Compact Decree.
18. New Mexico and the United States share a common objective of ensuring that groundwater in the LRG is used efficiently and effectively and conserved to the extent possible for future use.
19. The Groundwater Settlement Agreement, including the two Enforceable Hydrologic Conditions (UVDR3 and Aquifer Storage Loss), strikes a fair and reasonable balance between groundwater use and reliance on groundwater in times of drought on the one hand, and protecting the Aquifer on the other.
20. The Groundwater Settlement Agreement provides a process for Reclamation to consult with New Mexico if either UVDR3 falls below 0.79 or Aquifer Storage Loss is occurring when the three-year average release from Caballo Reservoir (CAB3) is 400,000 acre-feet or more. If one of those metrics is met, it may signal an issue with groundwater management that impacts the sustainability of the Aquifer and the ability of the Project to deliver water to the state line. To evaluate the issues, the consultation process for the two Enforceable Hydrologic Conditions requires New Mexico and Reclamation to consider relevant data, evaluate the potential causes, and assess possible actions that New Mexico may take. While New Mexico ultimately retains discretion to determine what actions are needed (subject to judicial review), it welcomes this

consultation process and the valuable expertise that Reclamation will provide.

Complying with the Compact Decree

21. As I explain above, the ISC will play a significant role in monitoring and complying with New Mexico's obligations under the Compact Decree. Each year, the Rio Grande Compact Commission ("RGCC") will determine the Annual and Accrued Departure for purposes of tracking Compact compliance. Based on the Accrued Departure, New Mexico will act, as necessary, to stay within the Negative Departure limit of 120,000 acre-feet established in the Compact Decree.
22. Because the Compact Decree utilizes a D2 baseline, satisfying the Depletion Reduction obligation in the Groundwater Settlement Agreement and reducing depletions to the same D2 baseline will facilitate New Mexico's compliance with the Compact Decree.
23. As described by State Engineer Anderson in her Declaration, one of the tools New Mexico may utilize to comply with its obligations is priority administration, or alternative administration if applicable, to curtail water use in New Mexico.
24. The Operations Settlement Agreement provides additional tools for New Mexico to comply with the Compact Decree. Specifically, New Mexico has a right, subject to the provisions and limitations in the Third-Party Implementing Contract, to order Allocation Transfers from EBID to the El Paso County Water Improvement District ("EPCWID") of up to 50,000 acre-feet each year. As described by Mr. Serrano in his Declaration, those Allocation Transfers are from converted water from one of four sources:
 - a. First, as part of the Depletion Reduction obligation, New Mexico will obtain water rights associated with Combined-Right Lands within EBID that have both groundwater and surface water. The groundwater will be Permanently Retired, but the surface water can be used elsewhere within EBID or for Allocation Transfers, at New Mexico's discretion. This source of converted water for Allocation Transfers is referred to as Base Allotment.

- b. Second, New Mexico may lease allotment water from other EBID members and use it for an Allocation Transfer. This source of converted water for Allocation Transfers is referred to as Lease Allotment.
 - c. Third, New Mexico can notify EBID to include New Mexico's allotment water from the Combined-Right Lands in its Allocation for use by other EBID members. In this circumstance, the ISC receives a credit in the same amount as the allotment water that can be used for Allocation Transfers in future years. This source of converted water for Allocation Transfers is referred to as Converted Water Credits. New Mexico can build a credit of up to 60,000 acre-feet which can be used for Allocation Transfers.
 - d. Fourth, New Mexico can order an Allocation Transfer from the same year EBID Project Allocation. This source of converted water for Allocation Transfers is referred to as Allocation Forbearance. Under the Third-Party Implementing Contract, this source of converted water is costly, and New Mexico intends to use Allocation Forbearance only as a last resort.
25. As described elsewhere, when an Allocation Transfer occurs from EBID to EPCWID, the Negative Accrued Departure under the Compact Decree are reduced by an equal amount. Thus, if necessary, Allocation Transfers are an effective method for New Mexico to manage Accrued Departures.
26. To illustrate how the ISC might utilize the tools provided under the Operations Settlement Agreement for compliance with the Compact Decree, I provide the following demonstrative figure. Dr. Barroll uses the same demonstrative figure in her Declaration. This figure was created from one of the models that New Mexico has used to evaluate its options going forward. The scenario shown below is intentionally dry. I used a dry scenario because our modeling suggests that once the Depletion Reduction has been completed, under average, or even moderately dry conditions, New Mexico may not need to order Allocation Transfers to satisfy its obligations under the Compact Decree. The modeled scenario below takes the driest ten-year period since 2000 (which was itself a relatively dry period) and repeats those years 5 times for a total of 50 years.



27. The demonstrative figure contains the following components:

- a. The dashed black line represents the modeled Accrued Departures from the amount New Mexico is required to deliver under the Compact Decree (the “Index Obligation”) (Compact Decree, Section II.B.2.e-f); “0” represents the Index Obligation.
- b. The red dashed line represents the “Trigger” (Compact Decree, Section II.D). Under the Compact Decree, if the Negative Accrued Departure reaches 80,000 acre-feet, New Mexico has an obligation to take actions to reduce the Negative Accrued Departure to 16,000 acre-feet within six years. The intent is to take action before the Negative Departure Limit of 120,000 acre-feet is reached.
- c. The green line at the top represents the running total credit from the Converted Water Credits.
- d. The blue bars represent Allocation Transfers from Base Allotment.
- e. The pink bars represent Allocation Transfers from Converted Water Credits.

- f. The black bars represent Allocation Transfers from Allocation Forbearance.
 - g. The Negative Departure Limit is 120,000 acre-feet at the very bottom of the scale.
- 28. In the scenario shown in the demonstrative figure, we assume that New Mexico elects to use 75% of its Base Allotment for Allocation Transfers each year (blue bars). The rest of the Base Allotment goes into the credit account (green line). Again, depending on hydrologic conditions, it is possible that no Allocation Transfers will be necessary. New Mexico will carefully monitor the Accrued Departure and is likely to use Base Allotment proactively to keep the Negative Accrued Departure at manageable levels. That approach is illustrated in the demonstrative figure above, and even in this dry scenario, New Mexico is able to stay within the limits established by the Compact Decree.
- 29. When larger Allocation Transfers are necessary and the Base Allotment is not enough, New Mexico will rely on Allocation Transfers from Converted Water Credits (pink bars). Again, that is reflected in the scenario above.
- 30. New Mexico has conducted modeling with different hydrologic scenarios to predict and understand how the overall settlement package will work. In a number of those scenarios, the Positive Accrued Departure limit of 50,000 acre-feet (Section I.C.4.c(1)) is reached and Allocation Transfers from EPCWID to EBID are required. From New Mexico's perspective, that type of Allocation Transfer helps maintain the 57/43 division of water required by the Compact.
- 31. As I state above, the RGCC will calculate Accrued Departure for purposes of Compact compliance. However, for purposes of the Operations Settlement Agreement, Reclamation and the Districts (EBID and EPCWID) will separately calculate the Accrued Departure. Because Allocation Transfers are an important tool for New Mexico, it is important that the Accrued Departure calculated by Reclamation and the Districts matches the Accrued Departure from the RGCC for Compact purposes. To address this concern, the Operations Settlement Agreement requires Reclamation and the Districts in determining Accrued Departure: (1) to

accept the Negative Annual Departure value reported for the previous year by New Mexico; and (2) to calculate Positive Annual Departures using the same methodology and equations as are used in calculating departures under the El Paso Effective Index (“EEPI”) (Sections I.C.4.a & b and Exhibit A). It is therefore expected that the two calculations will be the same. If there is a difference, the Operations Settlement Agreement provides a mechanism for Reclamation, the Districts, and New Mexico to meet to reconcile the calculations.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on August 28, 2025.



Hannah Riseley-White

SIGNATURE CERTIFICATE



REFERENCE NUMBER

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SIGNERS

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No. 141, Original

In the

SUPREME COURT OF THE UNITED STATES

STATE OF TEXAS,

Plaintiff,

v.

STATE OF NEW MEXICO and
STATE OF COLORADO,

Defendants.

OFFICE OF THE SPECIAL MASTER

CERTIFICATE OF SERVICE

This is to certify that on this August 29, 2025, I served a true and correct copy of the below listed documents upon all parties and *amici curiae*, by and through the attorneys of record and/or designated representatives for each party and *amicus curiae* in this original action. As permitted by order of the Special Master, and agreement among the parties, service was made by electronic mail to those individuals listed on the attached service list.

1. NOTICE OF JOINT MOTION AND JOINT MOTION OF THE STATE OF TEXAS, STATE OF NEW MEXICO, AND STATE OF COLORADO TO ENTER COMPACT DECREE SUPPORTING THE RIO GRANDE COMPACT;
2. MEMORANDUM OF POINTS AND AUTHORITIES IN SUPPORT OF THE JOINT MOTION OF THE STATE OF TEXAS, STATE OF NEW MEXICO, AND STATE OF COLORADO TO ENTER COMPACT DECREE SUPPORTING THE RIO GRANDE COMPACT;

3. COMPENDIUM OF EXHIBITS IN SUPPORT OF THE JOINT MOTION OF THE STATE OF TEXAS, STATE OF NEW MEXICO, AND STATE OF COLORADO TO ENTER COMPACT DECREE SUPPORTING THE RIO GRANDE COMPACT, including the following:

EXHIBIT 1	Consent Decree Supporting the Rio Grande Compact Appendix 1: Effective El Paso Index – Consent Decree Supporting the Rio Grande Compact Appendix 2: Map - Rio Grande Basin above Fort Quitman Gage
EXHIBIT 2	Declaration of Texas Rio Grande Compact Commissioner Robert Scott Skov in Support of the Joint Motion of the State of Texas, State of New Mexico, and State of Colorado to Enter Compact Decree Supporting the Rio Grande Compact Exhibit A: Resolution of the Rio Grande Compact Commission Regarding the Proposed Compact Decree in Original Action No. 141 <i>Texas v. New Mexico and Colorado</i>, in the United States Supreme Court (August 22, 2025)
EXHIBIT 3	Declaration of Texas Rio Grande Compact Commissioner Engineer Adviser Sue Ellyn “Suzy” Summers Valentine, P.E., C.F.M., in Support of the Joint Motion of the State of Texas, State of New Mexico, and State of Colorado to Enter Compact Decree Supporting the Rio Grande Compact
EXHIBIT 4	Declaration of William R. Hutchison, Ph.D., P.E., P.G., in Support of the Joint Motion of the State of Texas, State of New Mexico, and State of Colorado to Enter Compact Decree Supporting the Rio Grande Compact Attachment A: William R. Hutchison, Ph.D., P.E., P.G. Resume (August 2025) Attachment B: EEPI Excel Spreadsheet
EXHIBIT 5	Declaration of Scott A. Miltenberger, Ph.D., in Support of the Joint Motion of the State of Texas, State of New Mexico, and State of Colorado to Enter Compact Decree Supporting the Rio Grande Compact Attachment A: Scott A. Miltenberger Resume

EXHIBIT 6	Declaration of Elizabeth K. Anderson, P.E., in Support of Joint Motion of the State of Texas, State of New Mexico, and State of Colorado for Entry of Decree Supporting the Rio Grande Compact Exhibit A: Elizabeth K. Anderson, P.E., Resume Exhibit B: Subfile Order and Final Judgment in SSI 104
EXHIBIT 7	Declaration of Craig W. Cotten, P.E., in Support of Joint Motion of the State of Texas, State of New Mexico, and State of Colorado for Entry of Compact Decree Supporting the Rio Grande Compact
EXHIBIT 8	Declaration of Margaret Barroll, Ph.D., in Support of Joint Motion of the State of Texas, State of New Mexico, and State of Colorado for Entry of Compact Decree Supporting the Rio Grande Compact Attachment: Margaret Barroll, Ph.D., Resume
EXHIBIT 9	Declaration of Gregory K. Sullivan, P.E., in Support of Joint Motion of the State of Texas, State of New Mexico, and State of Colorado for Entry of Compact Decree Supporting the Rio Grande Compact Attachment: Gregory K. Sullivan, P.E., Resume
EXHIBIT 10	Declaration of Ryan J. Serrano in Support of Joint Motion of the State of Texas, State of New Mexico, and State of Colorado for Entry of Compact Decree Supporting the Rio Grande Compact
EXHIBIT 11	Declaration of Hannah Riseley-White in Support of Joint Motion of the State of Texas, State of New Mexico, and State of Colorado for Entry of Compact Decree Supporting the Rio Grande Compact

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