Exhibit 1

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 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

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October 29, 2020

I, William R. Hutchison, declare as follows:

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, and I am competent to make this declaration.

2. I am an independent consultant with over 35 years of professional experience as a groundwater hydrologist. I have been retained by the State of Texas to provide consulting services on hydrologic issues presented in the Lawsuit. My professional resume is included as Attachment 1.

3. My street address is 16717 Captain Hook Road, Jamaica Beach, TX 77554. The United States Postal Service does not provide home mail service to my address. My mailing address is 9305 Jamaica Beach, Jamaica Beach, TX 77554.

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 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), and Jamaica Beach, Texas (January 2016 to present).

11. I have completed (or I am actively working on) over 60 consulting assignments for over 30 different clients in Texas.

12. In the last four years, I have testified as an expert witness in two cases.

13. In August 2016, I was retained by the Middle Pecos Groundwater Conservation District to testify at a mandamus action filed against the District by Republic Water Company of Texas, LLC (Republic). Republic sued the District to have its permit application declared administratively complete despite not including results from a model run, which was required by the rules of the District. My testimony involved details of the required model run. The Court agreed with the District's interpretation of the District's administrative completeness requirements.

14. In March 2019, I was retained as an expert witness for the General Manager of the Lost Pines Groundwater Conservation District in a contested case hearing. The Lower Colorado River Authority submitted eight applications to withdraw 25,000 acre-feet of water per year from eight wells in Bastrop County, Texas. I 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, I reviewed model runs of the applicant's and protesting parties' experts. Specifically, I 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 impacts to 39 monitoring wells for use in future monitoring. I was deposed on my expert report and pre-filed written testimony, and I testified at the contested case hearing.

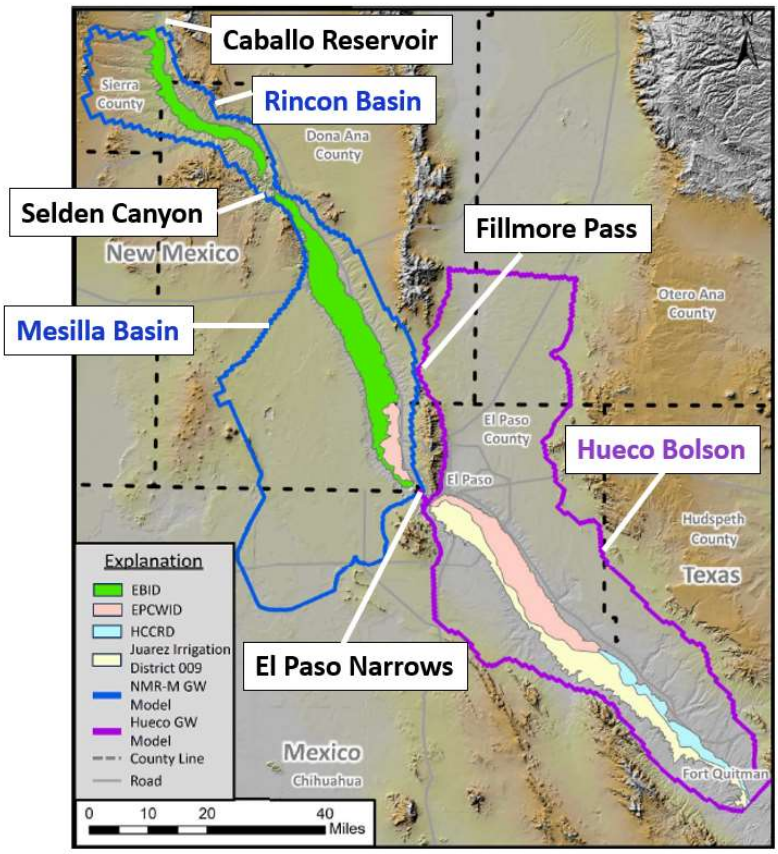
15. A summary of my experience with developing, reviewing, updating, and running simulations with 37 groundwater models in Texas since 2001 is presented in Attachment 2, and 24 models outside of Texas prior to 2001 is presented in Attachment 3.

16. My direct experience in the El Paso, Texas area began in 2001 as an employee of El Paso Water Utilities.

17. 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.

HYDROGEOLOGIC BACKGROUND

18. The map shown is a modified version of a map in the expert report of Daniel J. Morrissey, one of the New Mexico experts, and is intended to provide some geographic background of the surface water and groundwater resources of the El Paso area. The only modifications to Mr. Morrissey's version of the map is that the labeling in white boxes was added.



19. Water is released from Caballo Reservoir and flows in the Rio Grande through the Rincon Basin.

20. The Rio Grande flows through Selden Canyon from the Rincon Basin to the Mesilla Basin.

21. The Rio Grande flows through the El Paso Narrows from the Mesilla Basin to the El Paso Valley, where the groundwater basin is known as the Hueco Bolson.

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

23. The two major diversion points on the Rio Grande just below the El Paso Narrows are the Acequia Madre (for Mexico) and the American Canal (for Texas).

24. The Rincon Basin is entirely in New Mexico (the green area of the map).

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

26. Throughout the Rincon and Mesilla Basins in both New Mexico and Texas, there has been varying amounts of groundwater pumping for irrigated agriculture, municipal use, industrial, commercial, domestic, and livestock use.

27. Groundwater flow from the Rincon and Mesilla Basins to the Hueco Bolson is limited to minor flow through Fillmore Pass and the El Paso Narrows due to the geologic structure of the area. This hydrogeologic isolation between the basins means that the Rio Grande at El Paso stream gage is an ideal location to measure and assess impacts of groundwater pumping in the Rincon and Mesilla Basins to Rio Grande flow.

28. Because of the relative geologic isolation and the minimal flow between the Rincon-Mesilla Basin and the Hueco Bolson, groundwater models of the Rincon-Mesilla Basin and the Hueco Bolson can be developed independently.

29. Surface water and groundwater are connected in the Rincon and Mesilla Basins. As water flows in a surface water feature (i.e. a stream, canal, or river), the surface water flow can either increase from the inflow of groundwater or decrease due to seepage losses to the underlying aquifer.

30. When groundwater elevations are higher than surface water elevations, groundwater flows into the surface water body and surface flow increases (a gaining stream condition). Figure 1 conceptually illustrates a gaining stream condition.

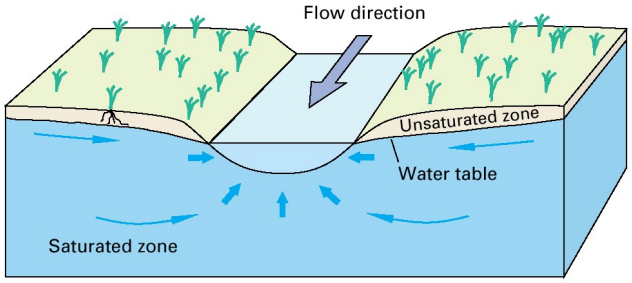


Figure 1. Illustration of a Gaining Stream (from Winter and others, 1988)

31. When groundwater elevations are lower than surface water elevations, surface water flows into the surrounding aquifer and surface flow decreases (a losing stream condition). Figures 2 and 3 conceptually illustrate two types of losing stream conditions.

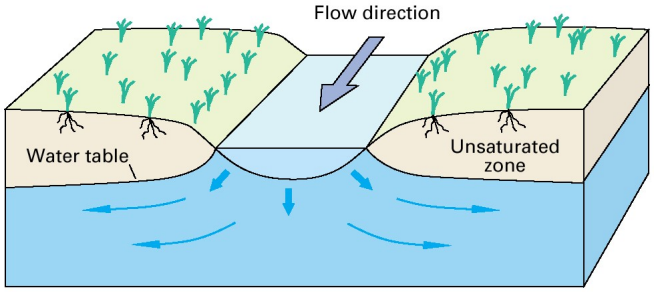


Figure 2. Illustration of a Losing Stream (from Winter and others, 1988)

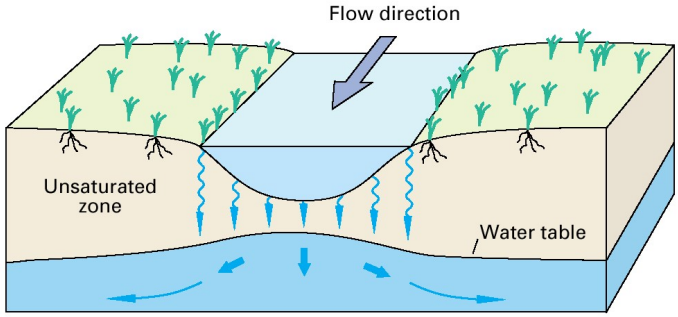


Figure 3. Illustration of a Disconnected Stream (from Winter and others, 1988)

32. Figure 2 illustrates a condition where groundwater elevations are lower than the stream elevation, but still connected to the stream bottom. This is a losing stream condition, and the seepage rate out of the stream is dependent on the difference between the elevation of the water in the stream and the elevation off the groundwater.

33. Figure 3 illustrates a condition where groundwater elevations have dropped lower than the stream bottom elevation. In this case (a disconnected stream), the seepage rate out of the stream has reached its maximum and is based on the depth of the stream only.

34. One of the impacts of groundwater pumping is the reduction of groundwater elevations (also known as drawdown). Long-term groundwater pumping can result in drawdown to the point where a stream that has been historically gaining (i.e. groundwater flows into the stream providing base flow) can be changed to a losing or disconnected stream (i.e. water percolates out of the stream and recharges the underlying aquifer).

SUMMARY OF NEW MEXICO MODEL (INTEGRATED LOWER RIO GRANDE MODEL)

35. New Mexico has disclosed the "Integrated Lower Rio Grande Model" (ILRGM) for use in this case. The ILRGM combines a River Ware model of the surface water network (and includes a simplified representation of the shallow groundwater system) and two detailed groundwater flow models using the MODFLOW-OWHM code: one of the Rincon Basin and the-Mesilla Basin and one of the Hueco Bolson.

36. One of the important outputs from the ILRGM is the flow of the Rio Grande in the El Paso Narrows (Rio Grande at El Paso). As described above, the El Paso Narrows represents the geographic and hydrogeologic boundary between the Mesilla Basin (upstream) and the El Paso Valley (downstream). If groundwater pumping in the Rincon and Mesilla Basins results in stream depletions, it can be measured at the gaging station in the El Paso Narrows. Any model that simulates surface water-groundwater interactions of the Rincon and Mesilla Basins should reproduce historic flows at this measuring point and should be capable of quantitatively assessing depletions at this measuring point.

37. As described in the expert reports of Greg Sullivan and Heidi Welsh, New Mexico completed a calibration run of the model (Run 0) simulating historic conditions from 1940 to 2017, a run simulating historic conditions using Rio Grande Project operations rules developed by New Mexico experts (Run 1), and 26 predictive simulations using the ILRGM.

38. The relevant ILRGM runs for this declaration are:

- Run 3 – NM Pumping Off (all New Mexico pumping off);
- Run 6 – RM Pumping Off (all Rincon-Mesilla pumping off); and
- Run 7 – TX Mesilla Pumping Off (all Texas pumping in the Mesilla Basin off).

39. These "pumping off" runs hypothetically assumed no groundwater pumping from 1940 to 2017 and resulted in higher simulated Rio Grande at El Paso flows as compared to the historic operation simulation (Run 1). Under the pumping off runs, groundwater elevations in the Rincon and Mesilla Basins are generally higher than the groundwater elevations in the Rincon and Mesilla Basins in the Run 1 simulation. The higher groundwater elevations result in more groundwater discharge to the surface water system (canals, drains and the Rio Grande itself), and, thus, results in higher surface water flows.

40. The New Mexico experts interchangeably use the terms "depletion" and "pumping impact" in the text of their reports, the figures associated with the reports, and the Excel spreadsheets that contain the results of the ILRGM simulations. New Mexico experts generally calculated depletion as the difference between the stream flow associated with a "no pumping" run of the ILRGM and the stream flow associated with the historic operation run of the ILRGM (Run 1).

ILRGM RIO GRANDE DEPLETION RESULTS

41. New Mexico experts provided ILRGM results for the relevant runs of the model in the following Excel spreadsheets:

- *Run 1 Summary – Operational – All Pumping On v116.xlsx*;
- *Run 3 Summary – Operational – NM Pumping Off v116.xlsx*;

- *Run 6 Summary – Operational – RM Pumping Off v116.xlsx*; and
- *Run 7 Summary – Operational – TX Mesilla Pumping Off v116.xlsx*.

42. New Mexico completed a specific analysis of Rio Grande at El Paso depletions using data and results from the ILRGM results described above. Attachment 4 is the *DataAnn* sheet of the Excel file named *Ferguson Rebuttal revised 9-15-20 v116.xlsx* that was disclosed by New Mexico.

43. The first line of Attachment 4 distinguishes results from the ILRGM, and calculations completed in the spreadsheet for the depletion analysis. The first eight columns are labeled "ILRG", which means that the data in the columns are directly from ILRGM. The final 11 columns are labeled "Calc", which means that the data in the columns are calculations completed in this spreadsheet based on ILRGM results. Please note that the blue color of the "Calc" columns was from the original Excel file disclosed by New Mexico.

44. The results in the *DataAnn* sheet of the Excel file can be grouped as follows:

- Rio Grande at El Paso Flow;
- Northwest Wastewater Treatment Plant (WWTP) Discharge;
- Sum of Rio Grande at El Paso Flow and Northwest WWTP Discharge;
- Pumping Impact in acre-feet per year; and
- Specific State Pumping Impact as a Percentage of Total Impact.

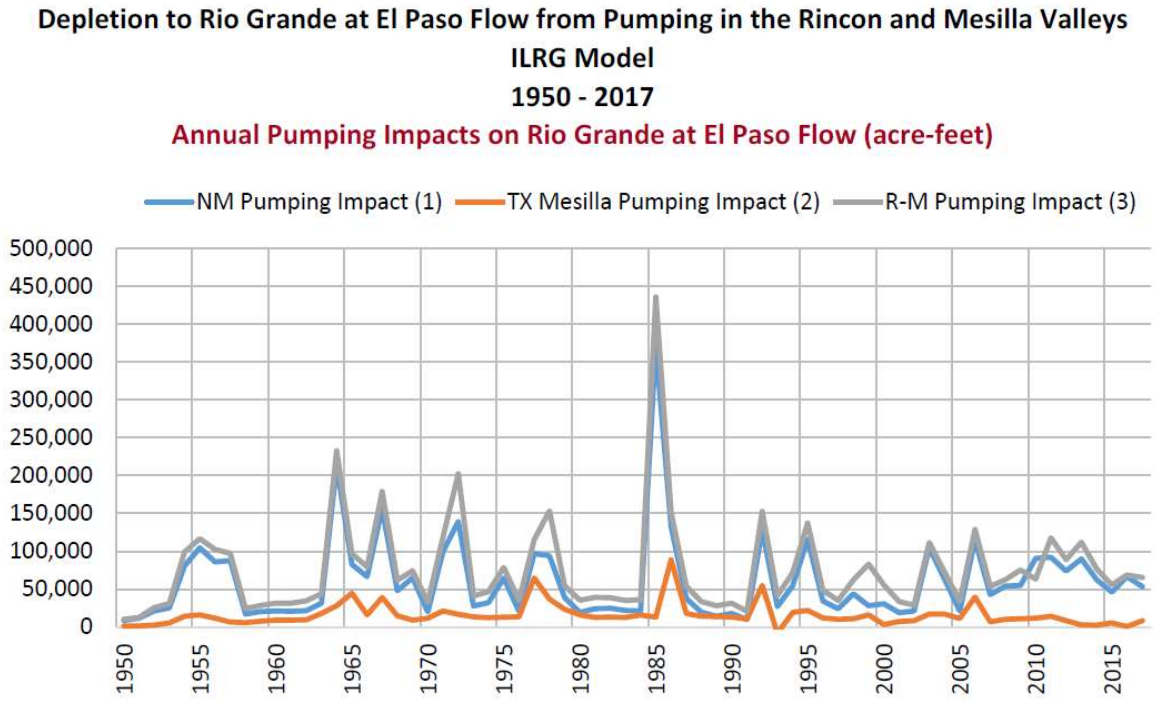
45. WWTP flow is from Texas Mesilla pumping Rio Grande at El Paso flow, Northwest WWTP discharge, and the sum of Rio Grande at El Paso flow and Northwest WWTP discharge are provided for each model run (Run 1, Run 3, Run 6, and Run 7) in the spreadsheet.

46. The Northwest WWTP is a El Paso Water facility that treats municipal wastewater from the west side of El Paso. The source of the water supply on the west side of El Paso (and, thus, the origin of the wastewater) is almost exclusively from groundwater pumping in the Texas portion of the Mesilla Basin (i.e. the Canutillo well field).

47. The Northwest WWTP discharge enters the Rio Grande downstream of the Rio Grande at El Paso stream gage. Thus, the sum of Rio Grande at El Paso and the Northwest WWTP discharge represents the available flow for diversions to the Acequia Madre (Mexico) and the American Canal (Texas) below the El Paso Narrows.

48. The difference in the sum of Rio Grande at El Paso flow and Northwest WWTP between a relevant "no pumping" run and the historic operation simulation (Run 1) is defined as the "pumping impact" in the spreadsheet (in acre-feet per year), and is either termed "depletion" or "pumping impact" in the text and figures of the New Mexico expert reports.

49. The annual depletions were presented in Figure 19-2 (page 147) of the September 15, 2020 version of the report by Greg Sullivan and Heidi Welsh and is reproduced below.



50. The columns on the right side of the *DataAnn* sheet (Attachment 4) are calculations of the pumping impact caused by each state's pumping expressed as a percentage of the total impact. New Mexico experts alternatively defined the total impact as

the impact simulated in Run 6 or as the sum of the impact simulated in the two state runs (Run 3 and Run 7), so there are two calculations of each state's impact.

51. The final line of New Mexico's spreadsheet with ILRGM results related to streamflow depletions (Attachment 4) are the average flows and depletions (calculated for each column in the spreadsheet) for the period 1940 to 2017.

52. Average stream depletions (or groundwater pumping impacts) as calculated at the Rio Grande at El Paso gage for the period 1940 to 2017 based on ILRGM results (as shown in Attachment 4) were reported by experts retained by New Mexico as follows:

- Total Rincon-Mesilla Groundwater Pumping Impact: 66,351 AF/yr
- New Mexico Groundwater Pumping Impact: 52,610 AF/yr
- New Mexico Groundwater Pumping Impact: 79 percent of total impact
- Texas Mesilla Groundwater Pumping Impact: 13,700 AF/yr
- Texas Mesilla Groundwater Pumping Impact: 21 percent of total impact

DISCUSSION OF ILRGM RESULTS AND ILRGM LIMITATIONS

53. The analysis presented in the spreadsheet (Attachment 4) completed by New Mexico experts establishes that groundwater pumping in New Mexico has depleted surface water flow in the Rio Grande.

54. In addition, Daniel J. Morrissey, one of New Mexico's experts acknowledged that the ILRGM shows depletions due to pumping in the Rincon and Mesilla Basins to streamflow measured at El Paso (Morrissey deposition, December 9, 2019, page 75, lines 12 to 18).

55. The ILRGM can be used for analyses that focus on large geographic areas and over a period of few to several years.

56. Limitations of the ILRGM affect the reliability of results focused on a single year or time periods less than one year, and results that focus on a small geographic area. The geographic and temporal scale limitation of ILRGM results is primarily because the

RiverWare model "governs" the results (Daniel J. Morrissey deposition of December 10, 2019, page 65, lines 13 to 23).

57. All models are simplifications of real-world systems. The New Mexico RiverWare model calculates surface water-groundwater interaction within "groundwater objects" that are several square miles in area. In contrast, the New Mexico groundwater models of the Rincon-Mesilla Basins and the Hueco Bolson calculates surface water-groundwater interactions in cells that are 10 acres in area. The groundwater objects in the RiverWare model are analogous to the groundwater model cells when comparing the surface water-groundwater interaction calculations. Daniel J. Morrissey acknowledged that the calculations in the RiverWare model are more "generalized" than in the groundwater models (Daniel J. Morrissey deposition of December 10, 2019, page 65, lines 6 to 12).

58. In summary, the ILRGM calculations rely on surface water-groundwater interaction calculations that are averaged over an area of several square miles and ignore groundwater model calculations that are averaged over an area of 10 acres in the groundwater models.

59. The surface water-groundwater interaction issue is one of the most important aspects of this litigation. Stream depletion is a reduction in streamflow that is caused by groundwater pumping. Calculations of stream depletion with the groundwater models are averaged over areas of about 10 acres, but calculations with the RiverWare model represent averages over areas that are several square miles. The choice by New Mexico experts to rely on the RiverWare model results instead of the groundwater model results is inconsistent with their claims of the sophistication and necessary complexity of the ILRGM (e.g. Daniel J. Morrissey deposition of December 9, 2019, page 44, line 22 to page 45, line 4).

60. Reliance on the ILRGM and its simplified representation of the surface water-groundwater interactions in the RiverWare model is appropriate for evaluating impacts of pumping over a large scale (i.e. impacts of pumping in New Mexico and impacts of pumping in Texas) and over a few to many years.

61. However, the limitations prevent reliable use of ILRGM results for analyses over smaller scales (several square miles) and for short time scales (months to a single year).

CONJUNCTIVE MANAGEMENT

62. Estevan Lopez, one of New Mexico's expert witnesses, defined conjunctive use during his July 6, 2020 deposition on page 68, lines 3 to 6 as: "using the available surface water as the primary irrigation supply and making up the difference up to the crop irrigation requirements with supplemental groundwater."

63. A proper conjunctive management approach increases total supply because the surface water component and the groundwater component are different sources.

64. If the groundwater supply is connected to the surface water supply (i.e. they are interconnected), the groundwater pumping depletes the surface water supply to some extent. The surface water depletion component of the groundwater pumping is not a "new supply" or "separate supply."

65. New Mexico's practice of conjunctive use is to use surface water ***and*** to pump interconnected groundwater limited only by crop needs or permit limits (Estevan Lopez 30(b)(6) deposition, September 18, 2020 page 36, lines 17 to 22).

66. New Mexico's "conjunctive use" as defined by Mr. Lopez ensures that New Mexico water users receive all the water they need while decreasing some water that would have otherwise flowed into Texas.

I declare under penalty of perjury that the foregoing is true and correct. Executed this 29th day of October 2020 at Aberdeen, North Carolina

William R Hutchison

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

Exhibit 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

DECLARATION OF ROBERT J. BRANDES, P.E., 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

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**Counsel of Record*

November 5, 2020

I, Robert J. Brandes, declare as follows:

BACKGROUND AND EXPERIENCE

1. My name is Robert J. Brandes, P.E., Ph.D. I am over the age of 18, have personal knowledge of the facts set forth in this Declaration, and if called as a witness could and would testify competently under oath to such facts.

2. I have been engaged in consulting engineering practice since the late 1960s specializing in water resources and related engineering and environmental disciplines. Today, I own and operate my consulting business Robert J. Brandes Consulting in Austin, Texas. My street address is 6000 Maurys Trail, Austin, Texas 78730.

3. I have been retained by the State of Texas to provide consulting services on hydrologic and water resources issues presented in this case.

4. A true and correct copy of my professional curriculum vitae is attached hereto as Attachment 1 and is incorporated as though fully set forth herein.

5. My education includes a Bachelor of Science degree in Civil Engineering from the University of Texas at Austin (1967), a Master of Science degree in Civil Engineering from the University of Texas at Austin (1968), and a Ph.D. in Water Resources from the from the University of Texas at Austin (1972).

6. I am licensed in Texas as a Professional Engineer, No. 39120.

7. I specialize in water resources and related engineering and environmental disciplines. I have represented numerous private, commercial, and governmental entities, providing various planning, analysis, permitting, design, and operational services for a wide range of water projects. I have directed and conducted numerous studies and investigations dealing with surface and groundwater hydrology and hydraulics; water resources planning and development; water availability modeling (WAMs), water rights permitting and related issues;

municipal, industrial and agricultural water supply; reservoir system operations; rural and urban flooding and stormwater management; water quality; irrigation system analyses; project site development engineering; and environmental impact assessments. My experience encompasses a wide variety of problems involving rivers and streams, lakes and reservoirs, groundwater aquifers, wetlands, and bays and estuaries, and I am especially familiar with the development and application of computerized simulation techniques for analyzing water-related phenomena in these systems.

8. I have prepared and presented testimony and served as an expert witness in various judicial proceedings in state and federal courts and in administrative and regulatory hearings conducted by the State Office of Administrative Hearings and natural resources agencies in Texas, as well as the Texas Legislature.

9. I have authored or co-authored numerous technical documents and project reports, and have presented many technical papers and lectures pertaining to water resources and water rights at professional society meetings, water conferences and short courses.

10. In the last four years, I have testified as an expert witness in two cases.

11. The Rio Grande is an interstate and international river, approximately 1,800 miles long, originating in southern Colorado. *See* 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, published in February 1938 (JIR) at 7 (Volume I). The JIR reflects an investigation by federal agencies at the request of the Rio Grande Compact Commissioners with input from Colorado, New Mexico, and Texas representatives. The primary purpose of the joint investigation was to compile factual data essential to support an apportionment of the waters of the Rio Grande above Ft. Quitman. JIR at vi-vii. A true and correct copy of the JIR is attached hereto as Attachment 2.

12. The Rio Grande winds southward approximately 400 miles across New Mexico, and crosses into Texas near the city of El Paso, where it defines the 1,250-mile international boundary between the United States and Mexico as it traverses to the Gulf of Mexico. The entire Rio Grande basin is depicted on the map below entitled **Figure 1**.

FIGURE 1: The Rio Grande basin

13. Along its entire course, the Rio Grande provides a source of surface water that is used extensively to meet the needs of municipalities, industries, and agricultural irrigators, as well as to support various environmental uses. Numerous dams and reservoirs exist along the river primarily for water supply and flood control purposes; consequently, flows in much of the river are substantially controlled and regulated.

14. With respect to the usage of water, the river is divided into two distinct sections at Fort Quitman. The Upper Rio Grande basin (the area above Fort Quitman, Texas) is comprised of parts of Colorado and New Mexico, and a very small part of Texas. The Upper Rio Grande basin itself is divided into three sections: (1) the San Luis section in

Colorado, (2) the Middle section in New Mexico, and (3) the Elephant Butte-Fort Quitman section in New Mexico, Texas, and Mexico. JIR at 7. This case is centered primarily upon issues involving the Elephant Butte-Fort Quitman section of the Upper Rio Grande basin. Figure 2 depicts the Upper Rio Grande basin.

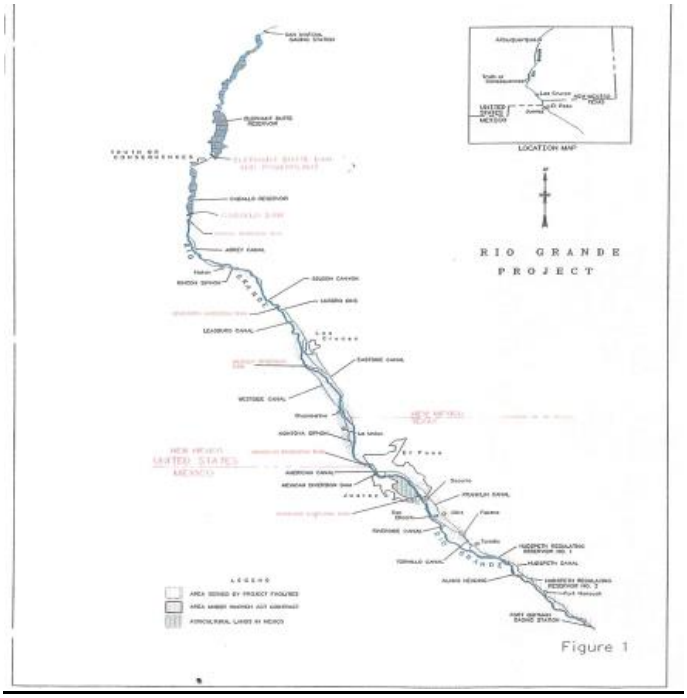

FIGURE 2: The Upper Rio Grande basin

15. A different naming system for the full Upper Rio Grande basin geographic area (upstream of Ft. Quitman, Texas) is used locally. The San Luis section in Colorado is referred to as the "Upper Rio Grande," the middle section in New Mexico is referred to as the "Middle Rio Grande," and the Elephant Butte-Fort Quitman section in New Mexico, Texas, and Mexico is referred to as the "Lower Rio Grande." This local naming system is used in my Declaration and in Texas's Memorandum of Points and Authorities in support of its Motion for Partial Summary Adjudication. Correspondingly, this case is primarily centered upon issues involving the Lower Rio Grande, as the term is used in this local naming system.

16. The Project was authorized pursuant to the Rio Grande Reclamation Project Act of 1905 as a federal project that provides water from the Rio Grande primarily for agricultural irrigation along the Rio Grande in southern New Mexico and in the El Paso Valley of Texas. Elements of the Project also provide hydropower, flood control, and water for municipal users. It included construction of Elephant Butte Dam and Reservoir ("Elephant Butte Reservoir" or "Reservoir") on the Rio Grande near Truth or Consequences, New Mexico, to provide stored water for Project users.

17. The states of Colorado, New Mexico, and Texas agreed to the Rio Grande Compact in 1938 (1938 Compact or Compact). As a result of the negotiations to formalize the 1938 Compact, depletions were frozen at pre-1938 conditions. Two delivery schedules, or indices, were adopted: one for Colorado to New Mexico, and one for New Mexico to Elephant Butte Reservoir. These schedules were derived from streamflow data and analyses developed primarily by the JIR – an effort to provide the needed data to resolve the impasse over the apportionment of the Rio Grande waters above Fort Quitman.

18. The total water supply available for diversion by Elephant Butte Irrigation District (EBID), El Paso County Water Improvement District No. 1 (EP#1), and Mexico included storage in and releases from Elephant Butte Reservoir and return flows generated within EBID and EP#1. New Mexico's post-Compact development has depleted that water supply by capturing returns flows that otherwise would have been available.

19. By 1938, and later, releases from Elephant Butte Reservoir comprised effectively all of the Rio Grande surface water supply in the Lower Rio Grande. In addition to releases from the Reservoir, small amounts of seasonal arroyo discharges contribute to available water in the Rio Grande. These arroyo flows were included in the total volume of water that was to be made available downstream of the Reservoir.

20. Mining of a groundwater basin means that more water is being pumped from the groundwater basin than can be replaced, causing groundwater levels to decline and, in the context of this case, has caused further depletion of the volume of water available to Texas. Groundwater pumping in New Mexico continues unabated today.

21. Colorado, New Mexico and Texas adopted the Compact in 1938 to ensure, among other things, a prescribed delivery of water from the Rio Grande in Elephant Butte Reservoir. The Project is dependent on the Compact for its water supply. The Project, in turn, is the means by which the water apportioned to Texas by the Compact is stored in Elephant Butte Reservoir, and subsequently delivered to Texas (subject to deliveries to EBID, pursuant to its contract with the United States, and to Mexico, pursuant to the 1906 Treaty). The relationship between the Compact and the Project is critical to the ability to effectively supply water from the Rio Grande to users in Texas, EBID, and Mexico. Both the Project and the Compact were conceived and implemented prior to the significant development of groundwater in the Rincon and Mesilla basins of New Mexico, which began in the early 1950s.

22. Today, the Project includes Elephant Butte Dam and Reservoir, Caballo Dam and Reservoir located immediately below Elephant Butte Dam, a hydropower plant at Elephant Butte Dam, three diversion dams on the Rio Grande in New Mexico (Percha, Leasburg, and Mesilla), two diversion dams on the Rio Grande in Texas (American and International, both owned and operated by the International Boundary and Water Commission), and an extensive system of canals, laterals, waste ways, and drainage ways that support irrigation operations in EBID and EP#1. The major dams and reservoirs and the diversion dams included in the Project are identified on the map of the region in **Figure 5**.

FIGURE 5: Map of Rio Grande Project Area

23. There are 159,650 acres authorized within the Project, with 90,640 acres within EBID in New Mexico and 69,010 acres within EP#1 in Texas. These acreages translate to approximately a 57/43 split for the distribution of irrigable acres between EBID and EP#1 (collectively "Districts").

24. Releases of Project water stored in Elephant Butte and Caballo Reservoirs are made at the start of the irrigation season (typically February) to Project users in New Mexico and Texas, and to Mexico. The Districts request releases of stored water during the irrigation season in response to irrigation demands. As a practical matter, however, diversions by the Districts and Mexico consist of varying amounts of reservoir storage, return flows from upstream irrigation operations, and occasional arroyo inflows. Return flows are a key part of Project operations, and interference with return flows removes a critical component of deliveries to Project users. Project return flows consist of excess irrigation tailwater and

groundwater seepage from irrigated fields that are collected in drains that convey these return flows to the Rio Grande. The proportion of return flows in the river increases in the downstream direction relative to stored water from the reservoirs, and the water diverted by Project users in the lower Mesilla basin and in the El Paso Valley of Texas includes diversion of significant quantities of return flows.

25. **Figure 6** is Table 90 of the JIR. It shows the percentage of net diversions for each valley for reservoir releases, arroyo flow, and drain flow for the period prior to the Compact. The net diversions in the Rincon portion of EBID contained 0.3 percent drain flow and seepage (return flows) and net diversions in the Mesilla portion of EBID contained 7.4 percent, while the net diversions into the Franklin canal in EP#1 contained 35.1 percent return flows and the net diversions into the Tornillo canal in EP#1 contained 57.7 percent return flows and only 38.2 percent of reservoir releases.

TABLE 90.—*Estimated percentages of reservoir water, arroyo inflow, and drainage in net diversions and disposal of reservoir releases, Elephant Butte-Fort Quitman section, 1930–36*

Division or item	Mean disposal of reservoir water 1930-36 (percentage distribution)	Mean percentage content, 1930-36, in net diversions, of—			
		Unused reservoir releases [1]	Arroyo inflow	Drain flow and seepage	Total
Rincon	8.5	97.5	2.2	[2] 0.3	100.0
Mesilla	46.4	89.8	2.8	7.4	100.0
El Paso	18.4	58.4			
Upper El Paso (Franklin canal)		61.5	3.4	35.1	100.0
Lower El Paso (Tornillo canal)		38.2	4.1	57.7	100.0
Rio Grande Project	73.3	79.8	3.0	17.2	100.0
Hudspeth	2.2	33.9	6.1	60.0	100.0
Juarez (Mexico)	11.4	49.5	5.4	45.1	100.0
Upper Juarez		58.3	3.1	38.6	100.0
Lower Juarez		24.4	11.8	63.8	100.0
Riverbed losses	9.2				
Passing Fort Quitman	3.9	17.2	14.8	68.0	100.0
Total	100.0				

[1] Distinguished from returned drainage originally from the reservoir.
[2] Invisible accretion to river.

Estimates based on detail study of all available data, 1930-36, on river flow, reservoir releases, diversions, wastes, drain flow, and arroyo inflow.

FIGURE 6: Table 90 of the JIR

26. After diversion by EP#1, Project water is delivered to the city of El Paso for municipal use under agreements with EP#1 and its constituents that assign their Project water

allotments for specific land parcels to the city. Excess canal flows and return flows from Project lands within EP#1 also provide a supplemental water supply for approximately 18,000 acres of land within the Hudspeth County Conservation and Reclamation District No. 1 (HCCRD) below EP#1 down to Fort Quitman, Texas.

27. Within the Project area from Elephant Butte Reservoir downstream to Fort Quitman, Texas, the Rio Grande covers approximately 210 river miles. Project water was to be allocated between irrigators in southern New Mexico and in the El Paso Valley of Texas in proportion to the irrigated acreage of Project lands within each state.

28. A water budget is an accounting for a defined time period of the inflows into, and the outflows from, a defined control area. Often, performing a water budget with known volumes of inflows and outflows for a specific time period can lead to the quantification of one or more unknown variables for that same time period. Performing multiple water budgets for a specific control area for different time periods can provide information regarding how certain phenomena may have changed. Even a visual depiction of the water budget for a control area showing the generalized movement of water into, within, and out of the area under different conditions and circumstances can be informative and help to understand how the Project water supply system was originally conceived to work and how it has changed with the development of groundwater in New Mexico.

29. I have utilized conceptual water budgets to illustrate the effect of groundwater depletions in the Project area within the Rincon and Mesilla basins of New Mexico where significant groundwater development began in the early 1950s. Prior to the development of extensive groundwater pumping in the Rincon and Mesilla basins, groundwater levels generally were relatively high and fluctuated in response to the seasonal application of irrigation water from the Rio Grande on Project lands. In the early days of the Project, this

phenomenon created a serious problem. Soon after the Project began delivering water to the irrigators, groundwater levels rose in New Mexico to and above ground level, thereby waterlogging and making useless land previously capable of growing crops. The solution was to construct a complex system of drains that would capture excess groundwater created by irrigation and return it to the river. This "return flow" became a significant source of irrigation water for downstream irrigators, particularly in Texas, a fact recognized and catalogued in the JIR. With the construction of the drains, irrigation water not consumed by crops and other vegetation or by evaporation, percolated down through the soil into the groundwater system, which typically flowed toward and into drains specifically designed for collecting groundwater and for conveying groundwater and excess irrigation tailwater away from fields and to the Rio Grande. This condition is illustrated in a general fashion by the diagram in Figure 10.

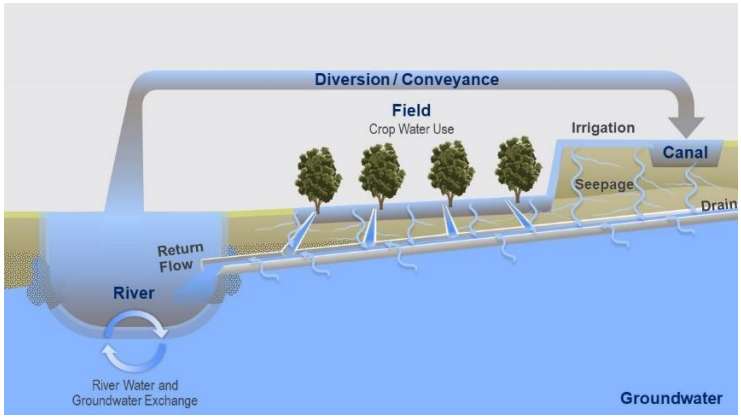

FIGURE 10: Schematic of Rio Grande and Groundwater System Interaction Prior to Development of Groundwater Pumping in Rincon and Mesilla basins

30. As shown in Figure 10, Project water is diverted from the Rio Grande into an irrigation system canal and then distributed to individual irrigated fields, where it is either consumptively used by the growing crops or evaporated into the atmosphere. Any excess irrigation water is either discharged directly to the drain as tailwater or percolated through the subsurface into the groundwater system. The bottom of the drain is below the upper level of

the groundwater; thus, groundwater is induced to flow toward and into the drain. Similarly, the bottom of the river channel is below the level of the groundwater, with water shown flowing in both directions depending on the relative heights of the water in the river and the groundwater from location to location. The irrigation tailwater and groundwater that is collected in the drain flows to the river and is referred to as return flow. The return flow from the drain that is discharged into the Rio Grande provides an important supply of Project water for users located downstream, namely users in the lower Mesilla basin and in the El Paso Valley of Texas. This important source of water for Project users was contemplated in the early development of Project operations and in the negotiations among the states leading up to the adoption of the 1938 Compact.

31. For example, the JIR investigation determined that approximately 35 percent of the total supply of Project water delivered to Texas in the El Paso Valley was from upstream return flows, with the majority of the balance originating as releases from Caballo Reservoir. Conversely, since water for Project users in New Mexico was diverted from the Rio Grande farther upstream, i.e., above the river outfalls of most drains, less than seven percent of New Mexico's total deliveries originated from return flows.

32. With the extensive development of groundwater in the Rincon and Mesilla basins of New Mexico that began during the early 1950s – particularly in the relatively shallow aquifers with generally high groundwater levels such as those along the Rio Grande – groundwater levels began to fluctuate and decline in some areas. This in turn caused discharges of groundwater into the drains, and directly into the river, to be reduced. Eventually, with enough groundwater pumping, the groundwater gradient in many areas reversed, with significant reductions in the groundwater inflows to the drains and into the river. This condition is illustrated by the diagram in Figure 11.

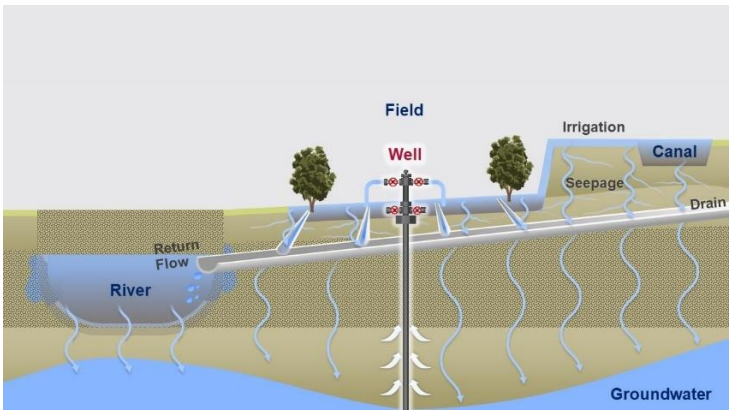

FIGURE 11: Schematic of Rio Grande and Groundwater System Interaction After Development of Groundwater Pumping in Rincon and Mesilla basins

33. As shown in Figure 11, the level of the groundwater is below the bottom of the river channel and the drain, and water flowing in the river and in the drain moves toward and into the groundwater system, rather than the other way around, as it was prior to the initiation of groundwater pumping. The discharge of return flow from the drain into the river is substantially curtailed, if not reduced to zero, thereby also reducing the flow in the river.

34. The phenomenon of reduced river flows caused by groundwater withdrawals is an underlying component of what is referred to as streamflow depletions, and these streamflow depletions have increased along the Rio Grande within the Rincon and Mesilla basins since significant groundwater development began in the early 1950s. One of the obvious impacts of these increased streamflow depletions has been to alter the Project water budget by reducing flows in the Rio Grande that otherwise would ultimately reach water users in the lower Mesilla basin and in the El Paso Valley in Texas. In essence, the release of a specific quantity of water from Caballo Reservoir now contributes less to the surface water supply for these users because of the losses of flow due to the increased seepage from the Rio Grande and interior drainage ways, thus altering the previously existing Project water budget.

35. In the early 1980s, the BOR developed the D1 and D2 allocation curves for the Project based on 1951-1978 operating data, and under normal supply conditions for the Project, these curves provided for 122 percent of the annual Caballo Reservoir release to be diverted from the Rio Grande for Project users. This additional 22 percent was almost entirely from return flows discharged into the Rio Grande from drains. This is shown on Figure 10 (Schematic of Rio Grande and Groundwater System Interaction Prior to Development of Groundwater Pumping in Rincon and Mesilla basins), discussed above. These D1 and D2 allocation curves reflect conditions that are different from the flow regime that existed at the time of the Compact. The D1 and D2 allocation curves were based upon the depleted flow conditions influenced by the extensive groundwater pumping in New Mexico during the 1951-1978 period.

36. I have reviewed, and am familiar with the contents of, the 2001 Report of the Rio Grande Compact Commission. A true and correct copy of the 2001 Report of the Rio Grande Compact Commission is attached hereto as Attachment 3. Within that report, beginning at page 3, is the Report of the Engineer Advisors to the Rio Grande Compact Commissioners, dated February 22, 2002 (2/22/02 EA Report). The 2/22/02 EA Report demonstrates that there is nothing in all the figures that the Compact Commission collects that addresses the 57/43 split. This is because that is an allocation issue and not a Compact issue. If it were a Compact issue, it would have been accounted for as such. Section 2.1 of the Memorandum of Understanding between the Rio Grande Compact Commission and the BOR, included in the 2001 Report of the Rio Grande Compact Commission, confirms that the Compact accounting data includes "deliveries by New Mexico to Texas at Elephant Butte." 2001 Report of the Rio Grande Compact Commission, at 19.

37. Regarding the 57/43 split, referable to Project allocations, the Project delivers the *water available to it* at the points of diversion on the river. The volume of Project water that was split 57/43 in 1938 for the Project to make the allocation to EBID and EP#1 pursuant to the contracts with the United States reflected the acreages of irrigated land in the two Districts at that time and the generally gaining condition of the river below Caballo Reservoir as influenced by relatively high groundwater levels in the absence of significant pumping. This changed beginning in the 1950s with the extensive development of groundwater in New Mexico and the subsequent lowering of groundwater levels along the Rio Grande that altered the condition of the river from a generally gaining stream to a generally losing stream. The implications of this change are obvious - river flow losses mean greater depletions and less Project water for downstream users. The Project has no control over New Mexico's depletions and can only allocate the amount of water remaining after the New Mexico groundwater pumping depletes Project water in the river, including Reservoir releases.

38. I declare under penalty of perjury that the foregoing is true and correct. Executed this 4th day of November 2020 at Austin, Texas.

Robert J. Brandes, P.E., Ph.D.

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Exhibit 3

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 ROBERT J. BRANDES, P.E., 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

Stuart L. Somach, Esq.*
Andrew M. Hitchings, Esq.
Robert B. Hoffman, Esq.
Francis M. Goldsberry II, Esq.
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**Counsel of Record*

December 22, 2020

I, Robert J. Brandes, declare as follows:

BACKGROUND AND EXPERIENCE

1. My name is Robert J. Brandes, P.E., Ph.D. I am over the age of 18, have personal knowledge of the facts set forth in this declaration, and if called as a witness could and would testify competently under oath to such facts.

2. I have been engaged in consulting engineering practice since the late 1960s specializing in water resources and related engineering and environmental disciplines. Today, I own and operate my consulting business Robert J. Brandes Consulting in Austin, Texas. My street address is 6000 Maurys Trail, Austin, Texas 78730.

3. I have been retained by the State of Texas (Texas) to provide consulting services on hydrologic and water resources issues presented in this case.

4. Details of my education and professional background can be found in paragraphs 1 - 10 of the November 5, 2020, Declaration of Robert J. Brandes, P.E., 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 Procedure 56 (Brandes First Declaration). TX_MSJ_000001 - 000016.

5. My resume was also appended to the Brandes First Declaration. TX_MSJ_000017 - 000021.

6. I have reviewed the State of New Mexico's (New Mexico) Motion for Partial Summary Judgment to Exclude Texas's Claim for Damages in Certain Years. New Mexico claims that because the years 1985-2002, 2005 and 2007-2010 were years in which the Rio Grande Project (Project) made available a full supply to the Districts, Texas's damages claims for those years should be excluded.

7. I have also reviewed the report of Margaret (Peggy) Barroll Ph.D. (October 31, 2019) ("Barroll Report") and the Spronk Water Engineers, Inc. Report dated October 31, 2019 ("Spronk Report"). I have also reviewed the subsequent reports filed by Barroll and Spronk in July and September of 2020; however, the results and underlying data reported in the later reports do not change the conclusions I've drawn from review of the October 31, 2019 reports of Barroll and Spronk.

8. I have reviewed Project allocations for the years 1985-2002, 2005 and 2007-2010 (Subject Years) identified by New Mexico as "full supply" years for the Rio Grande Project. I generally agree; however, based on annual allocations presented in the Barroll Report, the allocation for the year 2007 was less (by about 23,000 acre-feet) than the full supply allocation for the El Paso County Water Improvement District No. 1 (EP#1) as determined from the Bureau of Reclamation's D2 Curve. *See* Figure 1.

9. Although the Subject Years may represent "full supply" for the Project, I disagree with New Mexico's assertion that Texas did not suffer damages from failure to receive its entire Compact apportionment during those years.

A. New Mexico's modeling demonstrates that Texas would have been allocated more water during "full Project supply" years without New Mexico's groundwater pumping.

10. Figure 2 presents a bar graph showing annual allocations to EP#1 from 1980 through 2017 as simulated with New Mexico's ILRG model under historical conditions with groundwater pumping (Run 1, green bars). The orange bars above the green bars represent the additional allocation EP#1 would have received as simulated with the New Mexico model for a hypothetical condition without groundwater pumping by New Mexico (referred to as Run 3). The blue dots at the top of the graph signify full supply years as identified by New Mexico. As

shown, additional allocations were simulated for 2007, 2009, and 2010 without New Mexico groundwater pumping, all designated as full supply years by New Mexico. The same is also true with respect to 2017, also a full supply year according to the Barroll Report. With more water allocated during these full supply years, EP#1 very likely would have benefitted, suggesting that EP#1 very likely suffered damages historically due to New Mexico's groundwater pumping.

11. The diversions of Project water simulated with the New Mexico model for these same Run 1 and Run 3 conditions further demonstrate that EP#1 could have experienced increased Project water supplies during the full supply years but for New Mexico's groundwater pumping. Figure 3 presents a graph using the same format as that in Figure 2, but here annual diversions are plotted instead of allocations, with these results extending from 1980 to 2017. Again, the extended orange bars for some of the years, as simulated with New Mexico's Run 3 model, indicate additional diversions by EP#1 without New Mexico groundwater pumping, and many of these years are full supply years as they coincide with the blue dots at the top of the graph. This is further evidence based on New Mexico's own modeling that damages to EP#1 could have occurred due to limited Project water supplies during full supply years.

B. The "full supply" condition New Mexico relies on is the D2 Curve, which Incorporates Ground Water Pumping Depletions from 1951-1978

12. In the Subject Years, the "full Project supply" that the Bureau of Reclamation made available was based on the D2 Curve.

13. The D2 Curve was developed by Reclamation in the early 1980s to reflect the relationship between releases from Caballo Reservoir and deliveries to the Elephant Butte Irrigation District (EBID) and EP#1 (collectively "Districts") between 1951-1978 assuming that EBID received 57 percent of available Project water and EP#1 received 43 percent of available Project water.

14. I have plotted the D2 Curve in attached Figure 4 as the red line and data points.

15. The D2 curve incorporates the effects of groundwater pumping during the years 1951 - 1978.

16. During the years 1951 - 1978, New Mexico groundwater pumping was continuous from year to year, ranging from about 50,000 acre-feet/year up to 250,000 acre-feet per year and averaging about 140,000 acre-feet per year, as shown in Figure 5. Significant pumping occurred even in the full-supply years identified by New Mexico.

17. By contrast, the blue line and "x" data points plotted on attached Figure 4 reflect the same delivery relationship as the D2 Curve but are based on depletion conditions in 1938 when there was very little groundwater pumping in the Rincon and Mesilla Valleys of New Mexico. The data corresponding to the blue "x" data points shown on Figure 4 are from Run 2 of New Mexico's model with all groundwater pumping in New Mexico and Texas turned off, which is essentially the 1938 condition. And as illustrated, the 1938 Condition representation of the D2 Curve lies considerably above the 1951 - 1978 D2 Curve, obviously indicating that groundwater pumping that began in the early 1950s reduced annual diversions (deliveries) of Project water relative to Caballo releases.

18. Figures 6 and 7 show overall change in the number of wells in the Lower Rio Grande below Caballo between 1938 and 2020. Based on Figure 6 there were very few wells and very little groundwater pumping in 1938, in contrast to the numerous wells in place along the Rio Grande in 2020 shown in Figure 7.

C. Effect of New Mexico Groundwater Pumping has been to disconnect drain flows to the Rio Grande, reducing Project supplies and Texas's apportionment

19. Based on work by William Hutchison using his Texas model and Shane Coors' assessment of New Mexico's model, groundwater pumping withdrawals beginning in the early

1950s in the Rincon and Mesilla basins caused groundwater levels to fall from conditions in 1938 at the time of the Compact. Expert Report of William Hutchison, Ph.D., P.E., P.G. (May 31, 2019) (Hutchison 2019 Report) and Expert Report (Supplemental Rebuttal Report) of Adolph (Shane) Coors V, M.E., P.E. (May 6, 2020) (Coors 2020 Report).

20. When Texas entered into the Compact it anticipated adequate drain flows to satisfy part of its apportionment. As shown in the 1938 report of the National Resources Committee, Regional Planning: Part VI-The Rio Grande Joint Investigation in the Upper Rio Grande Basin in Colorado, New Mexico and Texas 1936-7, the reliance on drain flows by Project water users increased relative to the distance downstream from Elephant Butte Reservoir. *See* Figure 8.

21. Based on the long-term volumes of groundwater pumping in the Rincon and Mesilla Valleys and the resulting lowered groundwater levels, the Lower Rio Grande basin experiences significantly reduced drain inflows to the Rio Grande due to:

a. infiltration of excess irrigation water from the fields directly to the subsurface rather to the drains;

b. increased seepage losses from the drains to the subsurface due to the lowered groundwater levels; and

c. increased seepage losses from the Rio Grande to the subsurface due to the lowered groundwater levels.

An illustration of how drain flows have been reduced since significant groundwater pumping began in the early 1950s is shown on the graph in Figure 9.

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D. Long Term Effects of New Mexico Groundwater Pumping

22. Texas' claims for damages arises primarily from the long-term effects of groundwater pumping by New Mexico, not effects that can be broken into an annual timestep.

23. These changes in the hydrologic system are not readily apparent when viewed from year to year, but when examined over long periods of time, they become quite evident. The effects of sustained groundwater pumping translate to long-term changes in hydrologic conditions that can extend the adverse effects of groundwater pumping over many years. Coors 2020 Report.

24. The prolonged effects of groundwater pumping in terms of reduced drain flows, increased seepage losses from the Rio Grande, and lower Rio Grande flows at El Paso continued from year to year with or without full Project water supplies. These prolonged effects have been demonstrated by plotting historical cumulative flows in the Rio Grande at El Paso versus historical cumulative releases from Caballo Reservoir. Expert Report of Robert J. Brandes, May 31, 2019; *see* Figure 10. On this plot, the distinct break in slope of the historical data around the early 1950s supports the conclusion that groundwater pumping in the Rincon and Mesilla basins, which significantly increased about that time in response to drought conditions, was the cause of the reduced river flows. These conclusions are confirmed by the simulated model results with (historical) and without (hypothetical) groundwater pumping as produced by Hutchison 2019 Report based on his Texas model and by Coors 2020 Report based on his analysis of results from New Mexico's model.

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E. New Mexico's Undisputed Facts Asserted in the NM MSJ on Apportionment Are in Dispute

25. I have reviewed the State of New Mexico's (New Mexico) Motion for Partial Summary Judgment on Compact Apportionment and Brief in Support (NM MSJ on Apportionment).

26. Based on review and evaluation of the Barroll and Spronk Reports and underlying data, I dispute certain of the assertions in the "Statement of Undisputed Material Facts" section.

27. New Mexico's reference in paragraphs 60, 63 and 64 of NM MSJ on Apportionment regarding how Project supply was historically allocated based on an equal acre-foot per acre basis is not relevant to apportionment of Rio Grande water under the Compact. This allocation applies solely to Project water already stored in Elephant Butte Reservoir and inflows to the Rio Grande downstream of the reservoir, whereas the Compact applies to Rio Grande deliveries to Elephant Butte Reservoir. Project allocations made to respond to orders by the District water users do not form the basis of Texas's Compact apportionment. The Compact requires New Mexico to deliver prescribed and indexed quantities of Rio Grande water to Texas in Elephant Butte Reservoir. The 1906 treaty with Mexico and the contracts between the federal government and the Districts then allocate the stored water in Elephant Butte Reservoir, along with downstream inflows to the Rio Grande, to Mexico, EBID, and EP#1.

28. New Mexico's own data as reported in the underlying files of the Spronk Report are inconsistent with the diversion percentages reported in paragraph 65 of NM MSJ on Apportionment and attributed in paragraph 65 to the work of New Mexico's other expert, Peggy Barroll. In paragraph 65, New Mexico states that from 1931 to 1979, diversions by EP#1 totaled 45.5 percent of total diversions, but the Spronk data show only 41.7 percent, slightly less than the 43 percent allocation. Similarly, for 1951 to 1979, in paragraph 65 New Mexico reports that

EP#1 diverted 43.8 percent of the total diversions, whereas the Spronk data show that EP#1 diverted only 38.5 percent. Methods used by Peggy Barroll and those described in the underlying data of the Spronk Report also differ in how the distributions of diversions by EP#1 in Mesilla Valley were made, with Barroll assuming 20 percent and Spronk an average of 14 percent.

29. The D1/D2 method referenced in paragraphs 68 through 70 and paragraphs 72 through 76 of NM MSJ Motion on Apportionment has nothing to do with Compact apportionment; rather, it relates to how the Project was operated during 1951 through 1978. The Compact requires Rio Grande water deliveries from New Mexico to Elephant Butte Reservoir for Texas, and the 1906 treaty with Mexico and the contracts between the federal government and the Districts allocate the stored water in Elephant Butte Reservoir, along with downstream inflows to the Rio Grande, to Mexico, EBID, and EP#1. Furthermore, the D1/D2 method does not reflect Project water supply conditions as they existed at the time of Compact adoption in 1938. The D1/D2 method understates the supply of Project water available under the Compact because it is based on Project delivery conditions that occurred during 1951 and 1978 when substantial groundwater pumping had already developed in the Rincon and Mesilla basins of New Mexico (*See* Figure 5) causing flows in the drains and in the Rio Grande at El Paso relative to releases from Caballo Reservoir and the deliveries to EP#1 to be reduced. (*See* Figures 9 and 10).

30. In paragraph 79 of NM MSJ on Apportionment, New Mexico asserts that the 2008 Operating Agreement "changed the way that water was allocated between the two Districts, and therefore the amount of water that was available for lands in New Mexico and Texas." In paragraph 80, New Mexico asserts its "primary concern" with the 2008 Operating Agreement is

that it is not consistent with the Compact and does not allocate 57 percent of Project supply to New Mexico lands.

31. In fact, under the Operating Agreement New Mexico has received more water than it otherwise should have based solely on the D2 Curve prior to implementation of the Operating Agreement. This is demonstrated by the graph in Figure 11. The blue x's show total Project surface water diversions between 2008 and 2016; the black x's show the total amount of diversions, including groundwater pumping by New Mexico, for the same period.

32. As stated in paragraph 83, the use of the D1/D2 method produces 376,000 acre-feet for EP1. However, as I have said elsewhere in my declaration, the D1/D2 method does not reflect 1938 conditions and does not represent Texas's Compact apportionment.

I declare under penalty of perjury that the foregoing is true and correct. Executed this 21st day of December 2020 at Austin, Texas.

Robert J. Brandes

Robert J. Brandes, Ph.D.

Figures follow on the next page.

Figure 1 - Analysis of New Mexico Full Supply Years

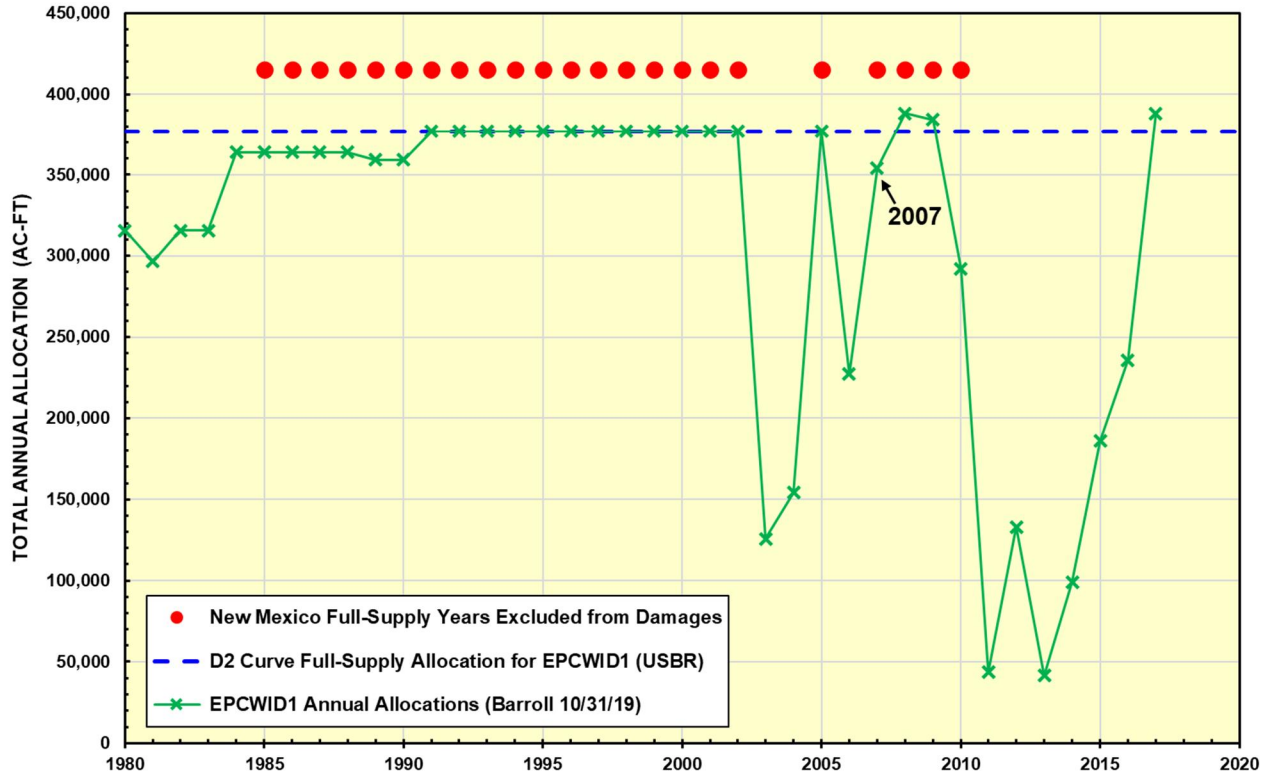


Figure 2 - Allocations to EP1 Based on New Mexico Model Run 1 (Historical) and Model Run 3 Without New Mexico Groundwater Pumping

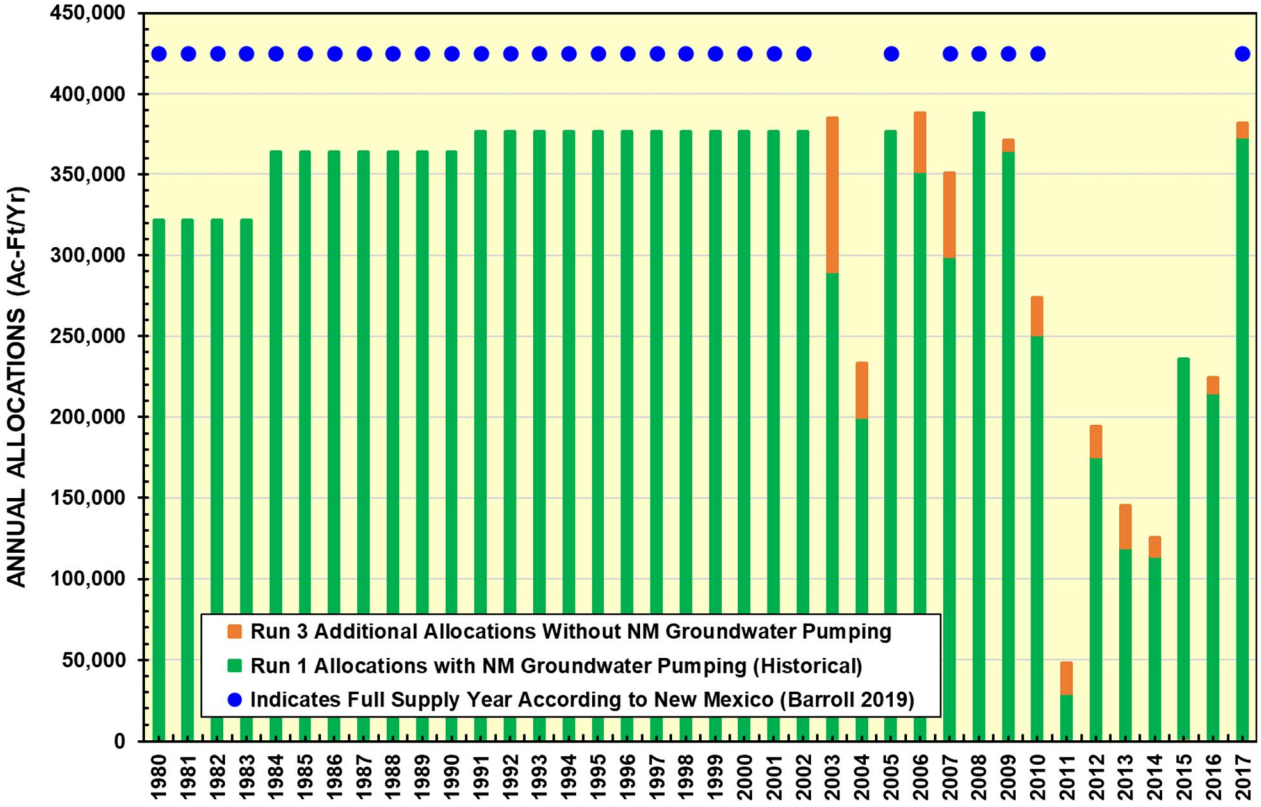


Figure 3 - EP1 Diversions Based on New Mexico Model Run 1 (Historical) and Model Run 3 Without New Mexico Groundwater Pumping

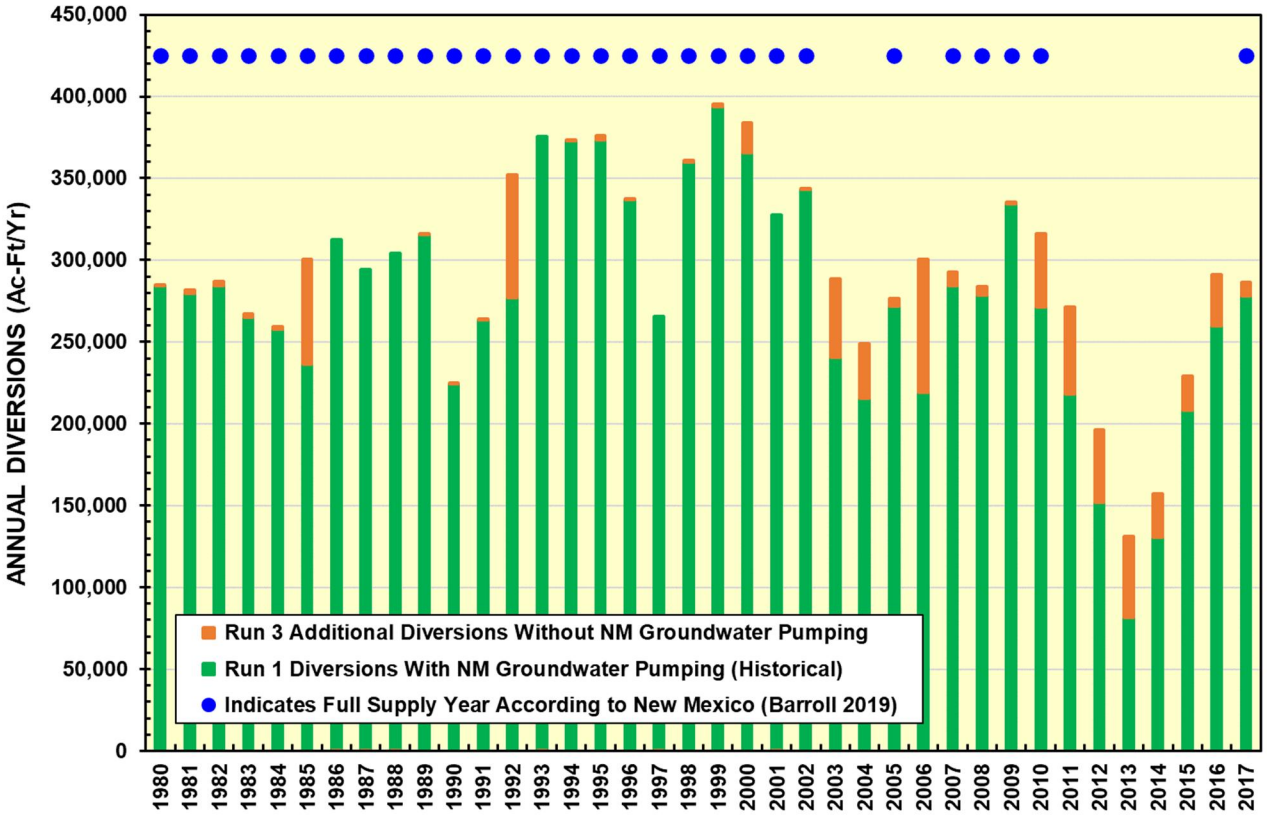


Figure 4 - D2 Curve and Similar 1938 Condition Curve Based on Results from New Mexico's Model Without Groundwater Pumping

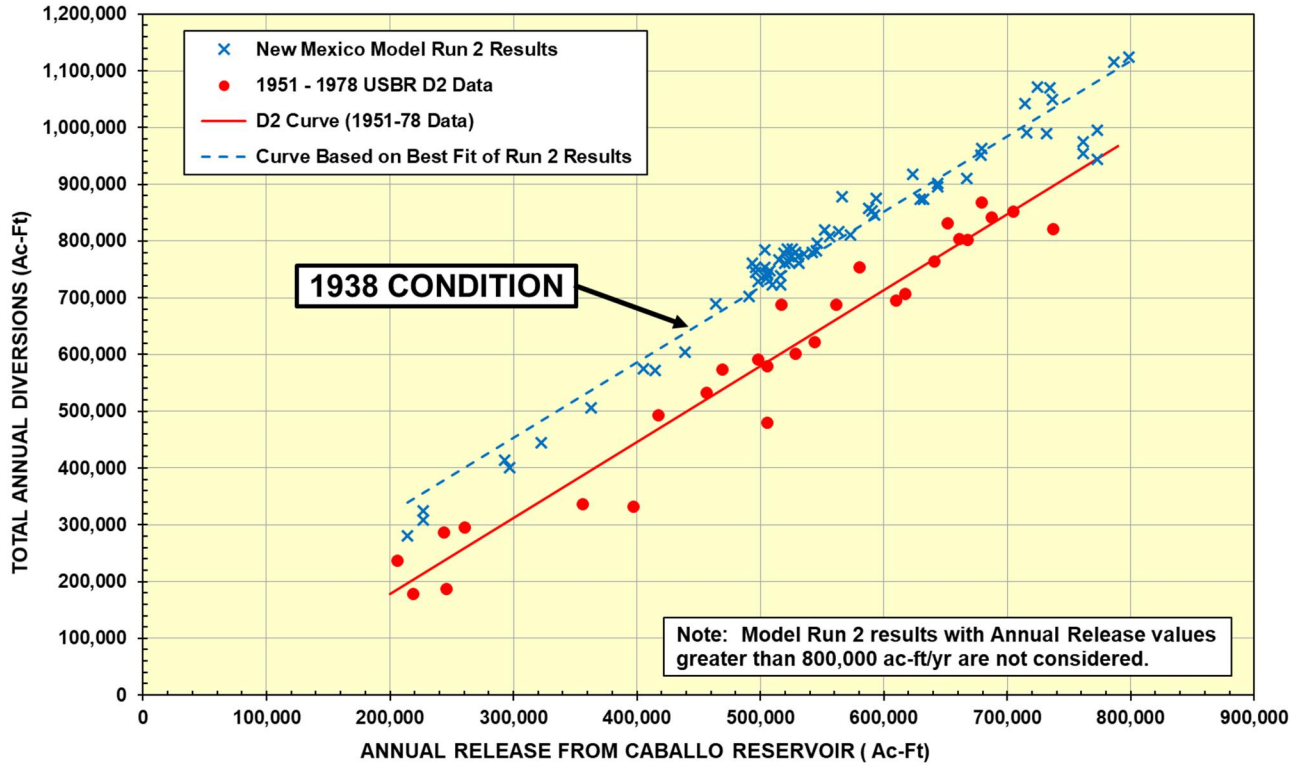
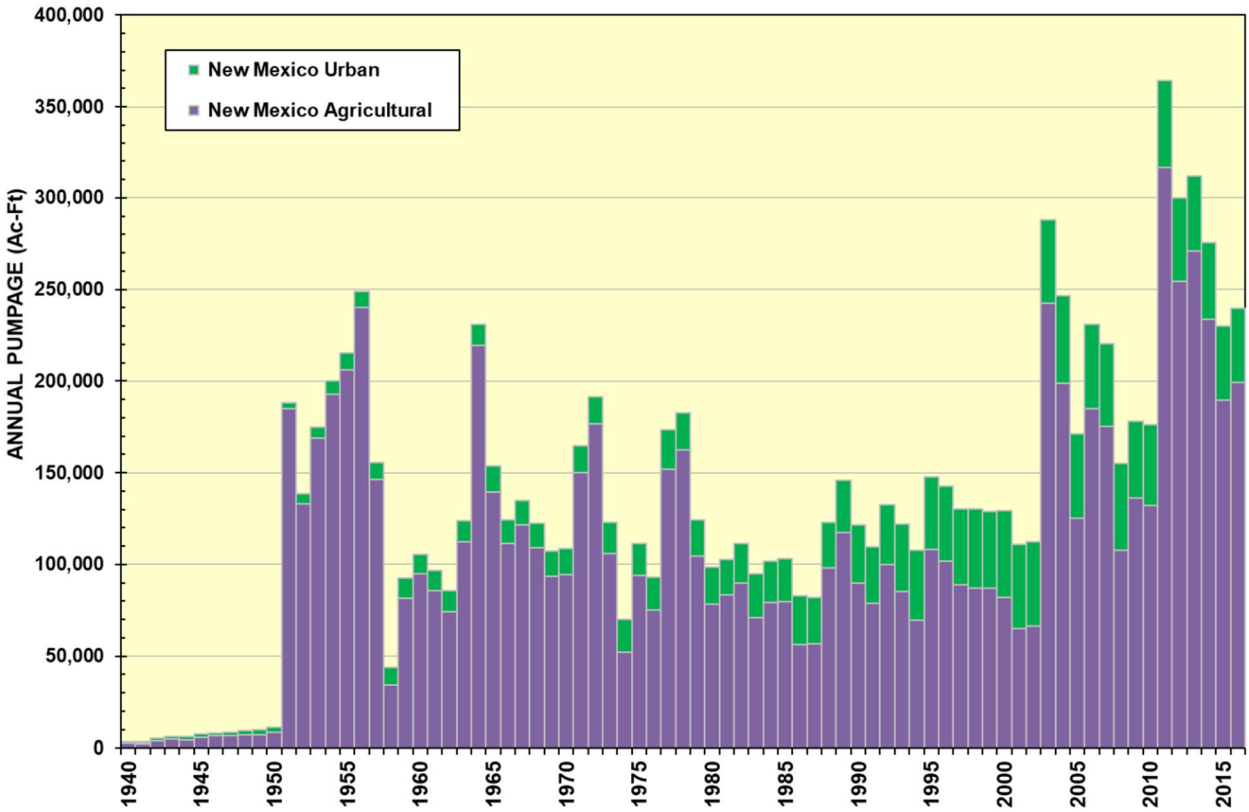


Figure 5 - Annual Groundwater Pumpage in Rincon and Mesilla Basins



Data from files of Expert Report by Staffan W. Schorr and Collin P. Kikuchi, "Water Budget Estimates in Support of Groundwater Model Development: Rincon and Mesilla Basins, New Mexico, Texas, and Northern Mexico, 1938 through 2016", prepared for State of Texas, in the matter of No. 141, Original, State of Texas v. State of New Mexico and State of Colorado, May 31, 2019.

Figure 6 - Groundwater Wells Along Lower Rio Grande in 1938

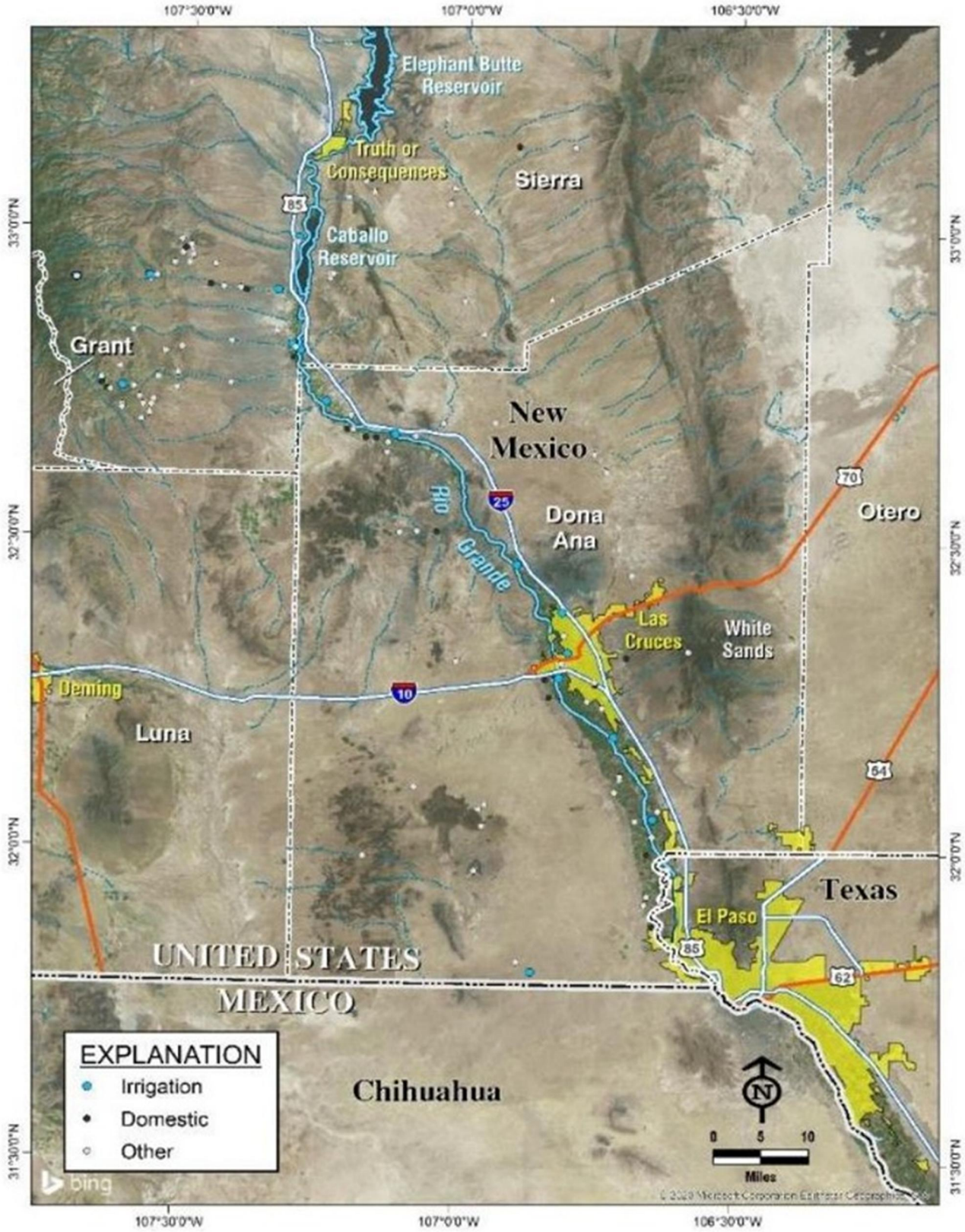


Figure 7 - Groundwater Wells Along Lower Rio Grande in 2020

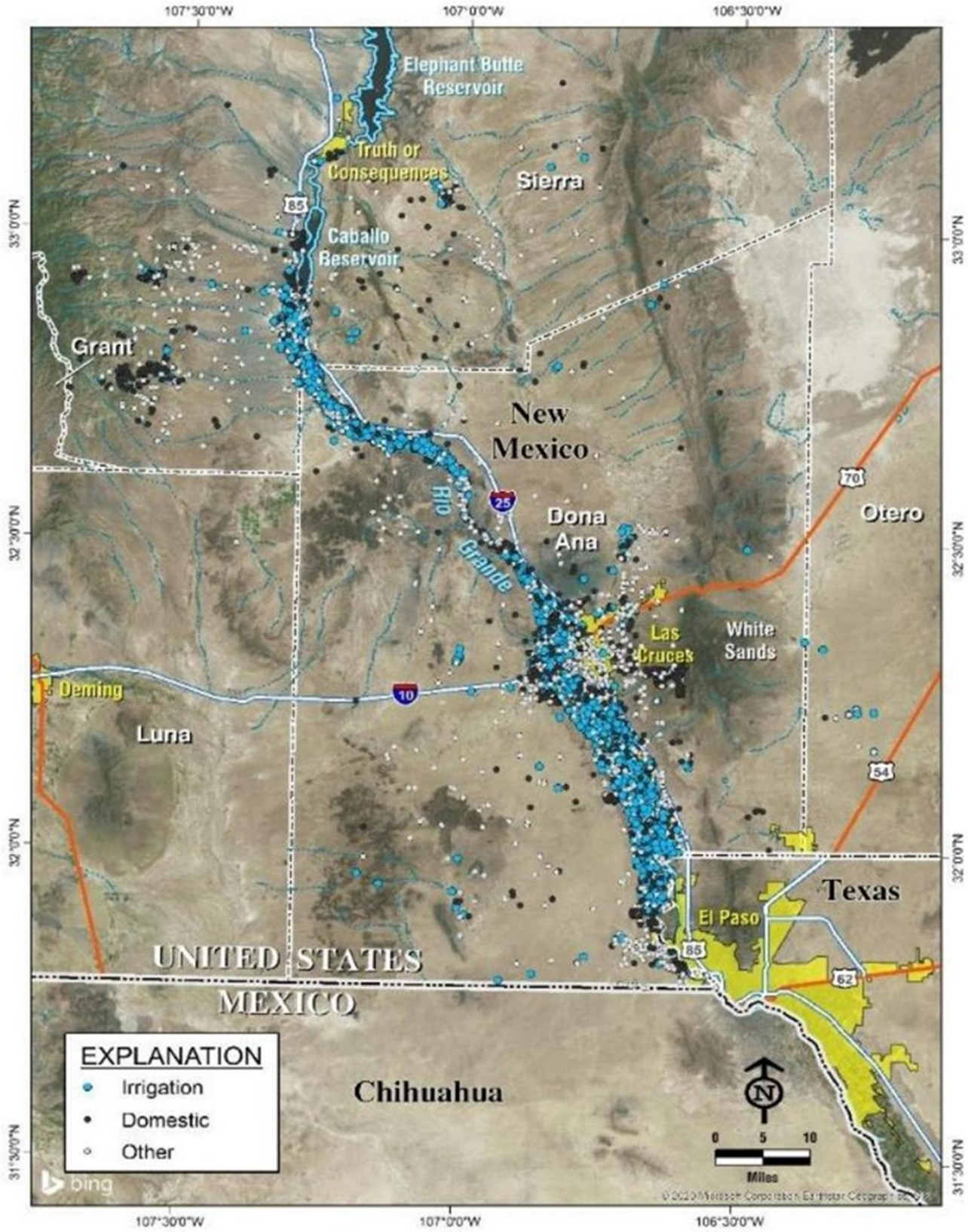
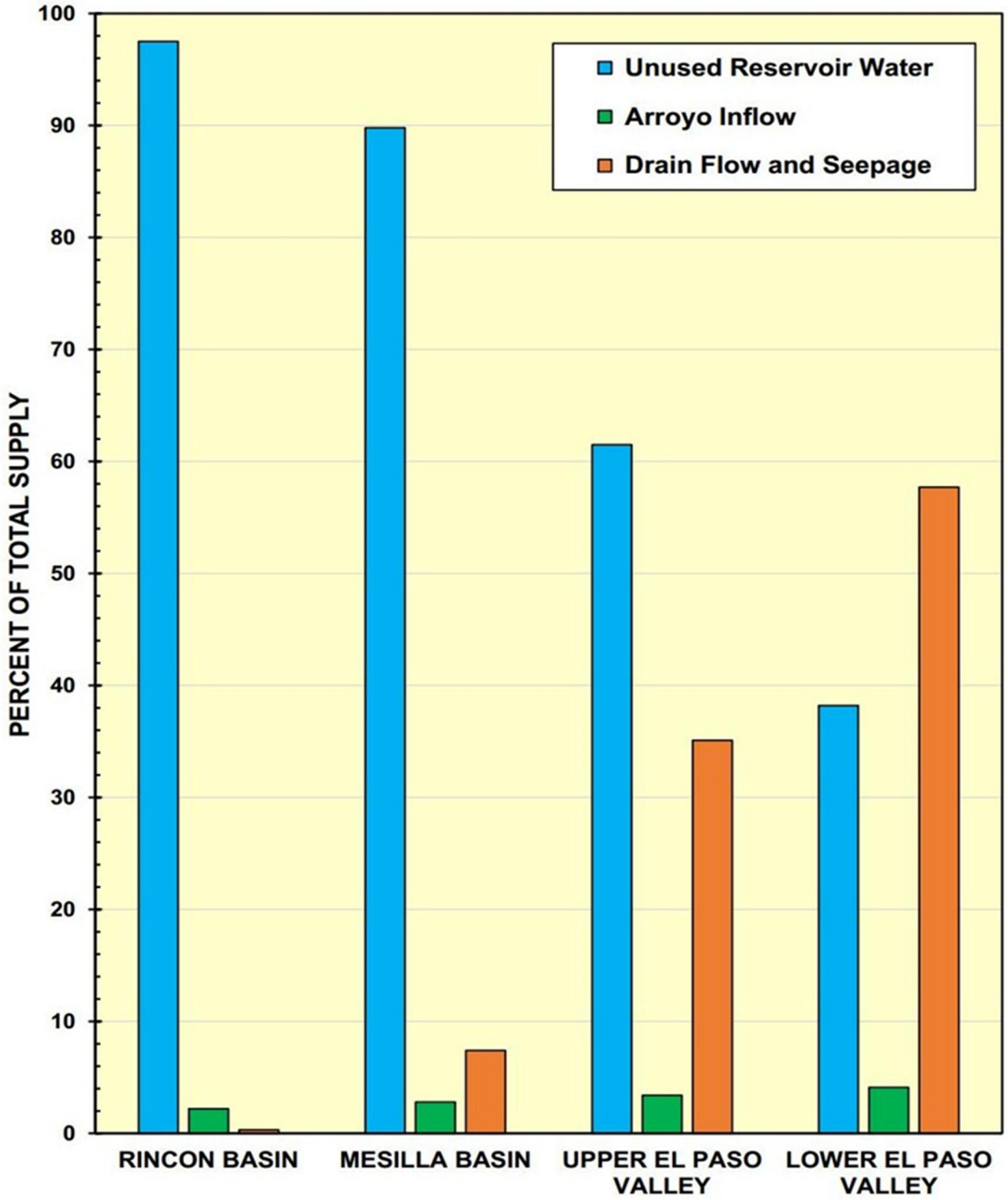


Figure 8 - Significance of Drain Flows to Downstream Project Water Users



Data from Table 90, National Resources Committee; *Regional Planning, Part VI – The Rio Grande Joint Investigation in the Upper Rio Grande Basin in Colorado, New Mexico, and Texas*, *Volume I*; Washington D. C.; February 1938.

Figure 9 - 1938-1995 Cumulative Discharges from the Montoya Drain to the Rio Grande

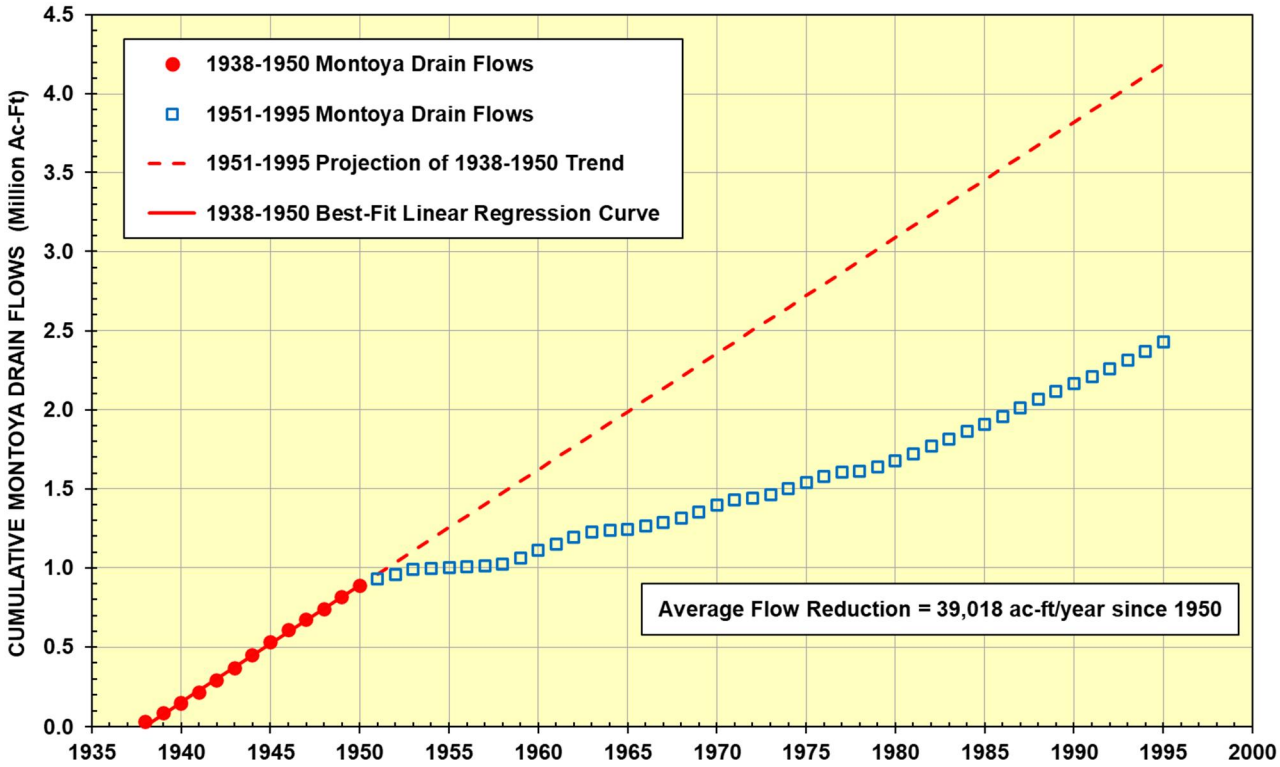


Figure 10 - Long-Term Relationship of Historical Rio Grande Flows at El Paso and Reservoir Releases

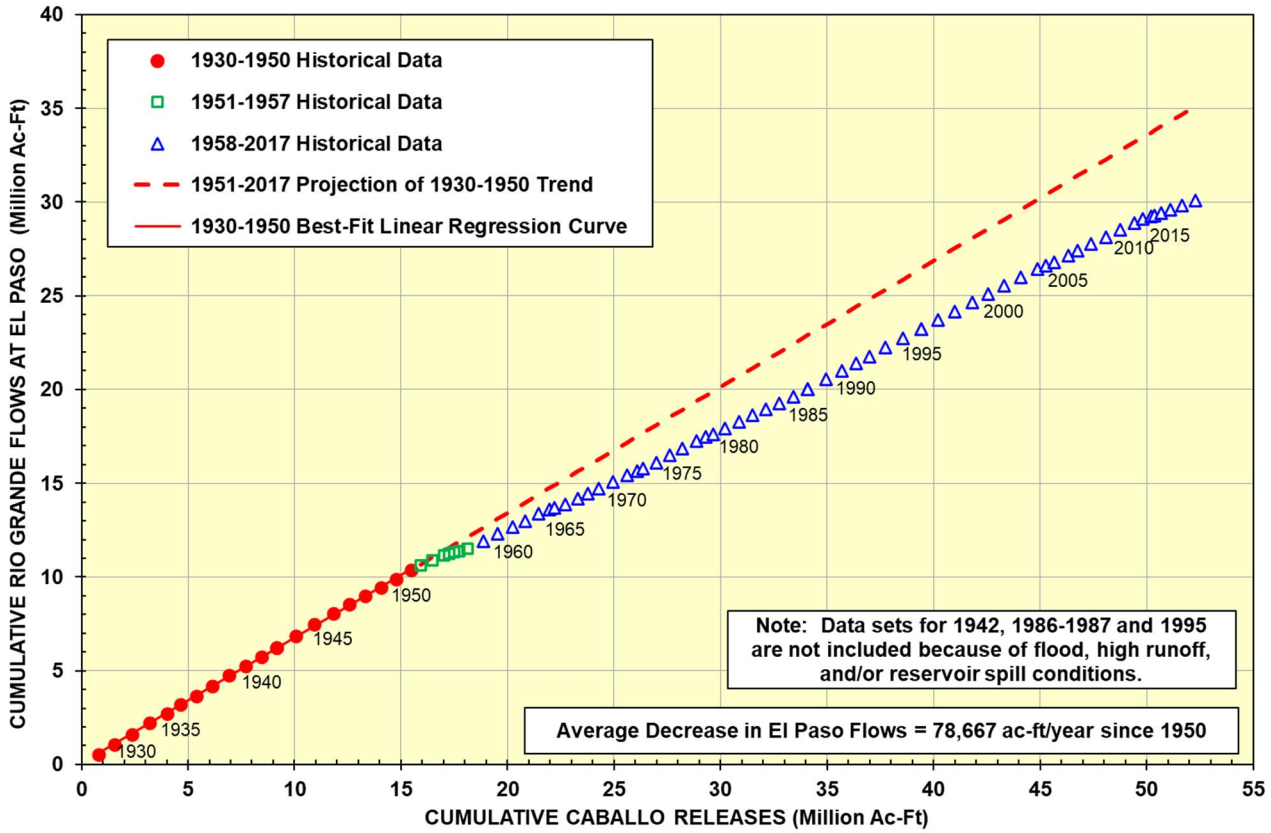


Figure 11 - Total Project Diversions for 2008-2016 Increased by New Mexico 2008-2016 Groundwater Pumping Compared to Total Diversions Allocated by D2 Curve

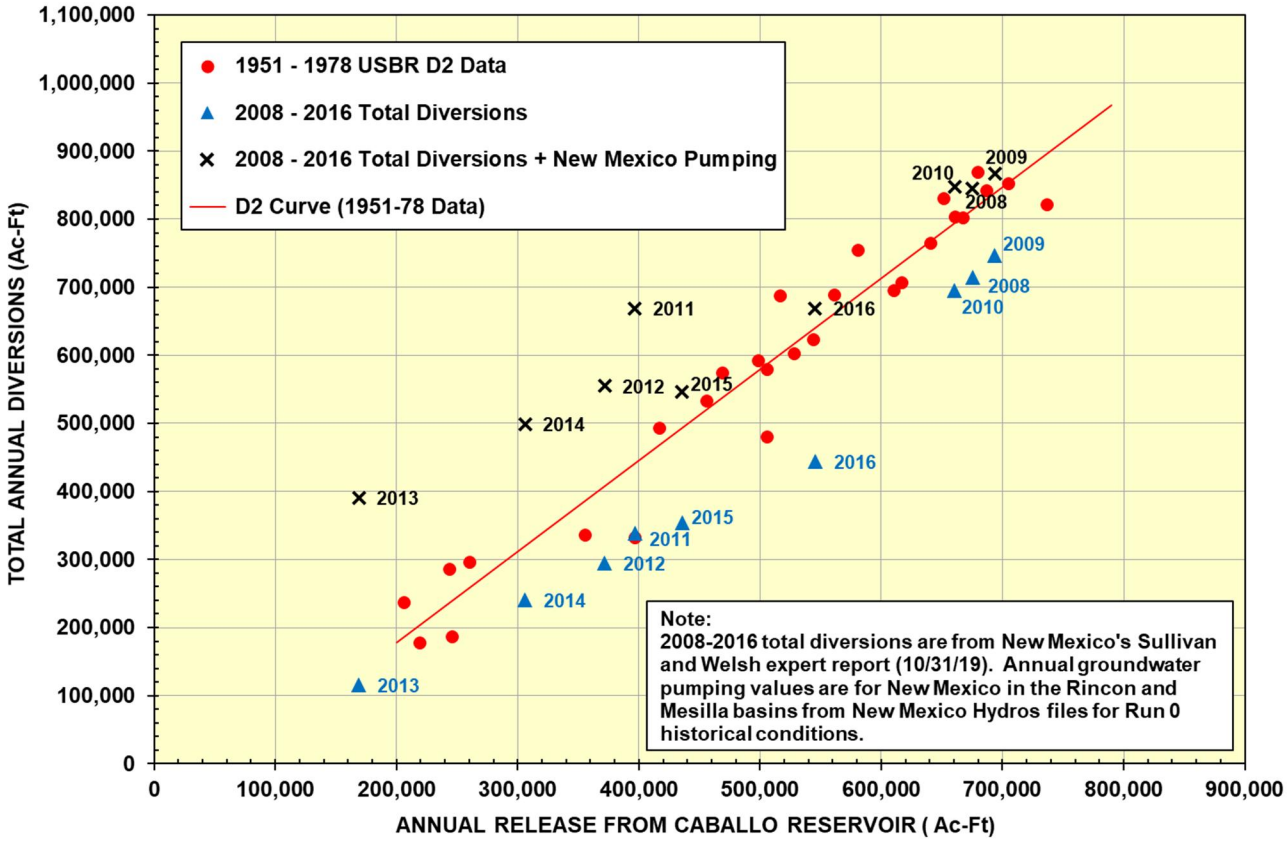


Exhibit 4

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 STATE OF TEXAS'S MOTION FOR PARTIAL SUMMARY JUDGMENT; MEMORANDUM OF POINTS AND AUTHORITIES IN SUPPORT THEREOF FEDERAL RULE OF CIVIL PROCEDURE 56

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November 2, 2020

I, Scott A. Miltenberger, declare as follows:

1. I am a professional consulting historian, specializing in water and natural resources issues. I am a partner at JRP Historical Consulting, LLC (JRP), located at 2850 Spafford Street, Davis, CA 95618. My qualifications to render the opinions contained in this Declaration are set forth in my professional resume, attached hereto as Attachment 1 and incorporated herein by this reference.

2. I have been retained as an expert by Somach Simmons & Dunn to provide expert opinions and testimony on behalf of the State of Texas as to the history and historical issues concerning the Rio Grande Compact of 1938 ("Compact" or "Compact of 1938").

3. To develop my expert opinions, I researched, collected, and analyzed thousands of archival documents, published primary and secondary sources, and academic monographs over the course of eight years. This material was obtained by myself, my former business partner (now retired) Mr. Stephen Wee, and JRP staff under my direction (all of whom possess graduate degrees in history) from several federal, state, and local records repositories. These include:

- 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.

4. I have also examined documents produced in this litigation by the states of Texas, Colorado, and New Mexico, and the United States. I have reviewed expert reports submitted in this action by New Mexico and the United States. I further reviewed the *First Interim Report of the Special Master* and the historical documents appended to that Report.

5. Based on my review of the historical record of the Rio Grande Compact of 1938, the following sub-paragraphs are a summary of my opinions regarding the states' agreed-to apportionment of the Rio Grande. I have, in brackets, indicated the specific locations within this declaration that provide support in the historical record for these opinions. True and correct copies of all the references contained in the footnotes of this declaration are attached as Attachment 2. The references may also be viewed in the electronic version of this declaration by selecting the links embedded in the footnote citations.

a. The Rio Grande Compact of 1938 was rooted in the conflicts over upstream depletions in the Upper Rio Grande Basin that began in the late-nineteenth century and persisted into the twentieth century. The issue of depletions and responses to that issue – the 1896 federal embargo, the federal Rio Grande Reclamation Project ("Rio Grande Project," or "Project"); the 1906 Mexican treaty, the Compact negotiations of the 1920s and 1930s, Texas's suit against New Mexico, and the Rio Grande Joint Investigation – shaped the Compact's "equitable apportionment" [paragraphs 6-19];

b. That "equitable apportionment" did not assign a specific quantity of water to each state. Rather, because the water resources of the basin were considered to be fully appropriated, the Compact was designed effectively to freeze depletions at

the Colorado-New Mexico state line and at San Marcial to "present conditions" to ensure "present uses" of water downstream of these points as of 1938. All three states nonetheless had "freedom of development" of their waters, provided depletions did not exceed those permitted by the Compact [paragraphs 20-28];

c. For Texas specifically in 1938, "present uses" required flows to be delivered by New Mexico at San Marcial to produce a 790,000 acre-feet (af) average annual release from Elephant Butte Dam. Only by diversion and re-diversion through the Rio Grande Project could this water serve lands in Texas down to Ft. Quitman pursuant to the Compact. Development of the Project rendered a state line delivery to Texas by New Mexico impossible, and thus San Marcial, at the head of the reservoir created by the federal dam, became the *de facto* state-line delivery to Texas [paragraphs 29-46]; and

d. The historical record indicates that groundwater was not considered a source of water augmentation to the existing surface water supply at the time of the Compact. Hydrological investigations prior to and following the Compact highlighted an interdependence between basin groundwater and surface flows in the Rio Grande. Later studies suggested groundwater could be used as a supply in times of drought or even a sustainable source of water within certain limits but recognized that groundwater extraction would ultimately deplete surface flows below Elephant Butte. By at least the 1950s, the New Mexico State Engineer was aware of this as well, and by the 1980s acknowledged that groundwater pumping since the 1950s imperiled the Compact [47-62].

CONFLICTS OVER UPSTREAM DEPLETIONS IN THE UPPER RIO GRANDE BASIN FORM THE ESSENTIAL HISTORICAL CONTEXT OF THE RIO GRANDE COMPACT OF 1938

6. Conflicts over upstream depletions in the Upper Rio Grande Basin form the essential historical context for the Rio Grande Compact of 1938. 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.[1] This action largely forestalled further private irrigation efforts in San Luis Valley, and facilitated both development of the federal Rio Grande Reclamation Project in New Mexico and Texas (authorized by Congress in 1905, extending the provisions of 1902 Reclamation Act) and an international treaty with Mexico in 1906.[2] Water from the Project's Elephant Butte Dam was to serve Mexico under the treaty and lands in southern New Mexico and western Texas by contract. Despite agitation by Colorado, federal authorities retained the embargo with little modification into the 1920s to protect the waters intended for Elephant Butte from upstream depletions.[3]

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[1] 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 Park, Maryland [hereafter NARA II]; 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.

[2] *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*, February 26, 1905, chap. 798, Public No. 104, 33 Stat. 814; *Proclamation of the Convention Between the United States and Mexico, signed at Washington on May 21, 1906, Providing for the equitable distribution of the waters of the Rio Grande for Irrigation Purposes*, January 16, 1907. Folder 690, Rio Grande Project. Corres. With Secy of State and Others as to Claims of Mexico. June 1, 1905 to Dec. 31, 1909, Box 823 Rio Grande, 874A- -690, Entry 3 General Administrative and Project Records, 1902-1919 [hereafter Entry 3], Record Group 115, Records of the Bureau of Reclamation [hereafter RG 115], National Archives at Denver [hereafter NARA-Denver]; and *JIR*, 8.

[3] 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; and *JIR*, 8.

7. In the early 1920s, Colorado sought to conclude an interstate compact solely with New Mexico to obtain relief from the embargo. Concern about renewed upstream depletions in the wake of a Colorado-New Mexico compact led Texas to push for its inclusion in the negotiations, and the upstream states acquiesced.[4] Revocation of the embargo in 1925 and federal approval of new right-of-way applications in Colorado prompted New Mexico to withdraw from the negotiations.[5]

8. The three states did not meet again until December 1928. At that conference, Colorado argued that construction of a Colorado state line reservoir would not impair flows to New Mexico and Texas, that it would only make use of waters otherwise wasted in the basin or lost to Mexico, and in fact, the downstream states stood to benefit from augmented flows into Elephant Butte created by upstream storage. New Mexico and Texas, however, feared that Colorado's plans would imperil water projects in their respective states. New Mexico expressed concern for the fledgling Middle Rio Grande Conservancy District ("MRGCD") project above San Marcial and 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.[6]

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[4] 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, MS 0235 Elephant Butte Irrigation District Records, 1883-1981, Rio Grande Historical Collections, New Mexico State University Archives and Special Collections, Las Cruces

[5] 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; 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].

[6] 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].

9. The resulting temporary compact of February 1929 reflected the impasse among the states over the question of whether proposed upstream developments would deplete flows to the detriment of existing uses downstream. The compact provided for construction of a Closed Basin drain and a "State line reservoir" by the federal government (Article II) and the establishment of several stream-gaging stations to gather flow data (Article III). The compact also restricted any further upstream depletions until consummation of a permanent compact. 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 this compact, which was set to expire in June 1935. New Mexico further recognized that "prior vested rights above and below Elephant Butte Reservoir shall never be impaired hereby" (Article XII). Whether a "closed basin drain and the State line reservoir be built" in Colorado prior to the compact's expiration, the commissioners for each state were to meet in June 1935 for "the purpose of concluding a Compact . . . providing for the equitable apportionment of the use of the waters of the Rio Grande among said States" (Article VII).[7]

10. When negotiations for a permanent compact resumed in December 1934, little progress was made.[8] The following month, Colorado made a detailed presentation, arguing once more that reservoir construction in the San Luis Valley would not deplete downstream

[7] 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.

[8] 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]; 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.

flows. New Mexico and Texas, although not convinced, agreed to a two-year extension of the temporary compact, until June 1937, to consider Colorado's proposal in detail.[9]

11. During this period, concern in Texas that MRGCD's operations within the Middle Rio Grande Valley were impairing the Elephant Butte water supply in violation of the 1929 compact led the state to file a complaint against New Mexico and the district in the United States Supreme Court in October 1935.[10] After extensive hearings, citing the current investigation by the 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 subsequently approved his recommendation, and adoption of the 1938 Compact brought an end to the suit.[11]

12. The investigation referenced by Warren was a direct outgrowth of the stalemate in the Upper Rio Grande Basin over the question of permissible upstream depletions. The NRC – a special working group within the Roosevelt administration that

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[9] Proceedings of the Rio Grande Compact Commission, Santa Fe, January 28-30, 1935, 1-45. ff. Proceedings of the Rio Grande Compact Commission, Santa Fe, New Mexico. 1934-1935, Box 62, Subseries 7.1, Series 7, PDECF, WRA, CSU-FC.

[10] 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].

[11] Special Master to Richard F. Burges, Esquire, March 26, 1937. ff. 4-1 Warren Charles, Correspondence re Texas v. New Mexico June 1936; *State of Texas v. State of New Mexico, No. 12 Original, 1936 Term, Statement by Special Master*, March 5, 1937, 4-7. ff. Warren Charles, Correspondence re Texas vs. New Mexico / March, 1937, Box 4 Correspondence, Notes, Reports re: Texas vs. New Mexico, Series 1: Materials re: cases, Charles Warren Papers 1885-1954, Manuscripts Unit, Harvard Law School Library, Historical and Special Collections, Cambridge, Massachusetts; *Supreme Court of the United States, October Term 1936, No. 12 Original, State of Texas vs. State of New Mexico, et al., Ad Interim Report of the Special Master*, received Mar. 26, 1937, 9-10 and 12-13; and *Supreme Court of the United States, October Term 1936, No. 10 Original, State of Texas vs. State of New Mexico, et al., Final Report of the Special Master*, filed Sep. 25, 1939, 4-6. ff. RG 267, Entry 26, TX v NM #10, Box 401 1939 to 1939 PI 139, Entry 26, Original Jurisdiction Case Files, 1792-2005 [hereafter Entry 26], Record Group 267, Records of the Supreme Court of the United States [hereafter RG 267], National Archives Building, Washington, DC [hereafter NAB].

aimed to foster planned development of the nation's natural resources – appointed a "Board of Review" ("Board") in September 1935, a month prior to Texas's filing in the Supreme Court, "to consider various projects and problems related to the use and control of waters" in the Upper Rio Grande Basin.[12]

13. Surveying the problems posed by increased water consumption above existing projects, the Board concluded in September 1935 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. The Board expressed concern that proposed and existing upstream projects in New Mexico above San Marcial (notably, MRGCD's) and in Colorado's San Luis Valley imperiled this supply.[13]

14. By the 1930s, the Project had been fully developed. Waters entering the federal dam not only fulfilled the 1906 Mexican treaty obligation of 60,000 af annually, but also served lands downstream to Ft. Quitman.[14] Under notices of appropriation filed with the New Mexico territorial engineer, the United States Reclamation Service (predecessor to the Bureau of Reclamation, or BOR) claimed 730,000 af annually in 1906, and "[a]ll of the unappropriated water of the Rio Grande and its tributaries" at Elephant Butte in 1908.[15]

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[12] *JIR*, 10.

[13] "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].

[14] *JIR*, 83-84.

[15] 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, RG 115, NARA Denver.

15. Absent importation of water from outside the basin, the Board believed "adjustments in use rather than new uses" was required.[16] It therefore recommended certain projects already approved by certain agencies be disapproved and that no future projects for the Upper Rio Grande Basin's waters proceed without the NRC's prior approval. A September 1935 executive order adopted this recommendation, and effectively reinstated the embargo.[17]

16. The Board also proposed a joint federal-state investigation to develop the information that would assist the states in formulating a permanent compact.[18] The Rio Grande Compact Commission embraced this idea when it was presented by NRC representatives in December 1935, provided that the investigation would be limited to the "collection, correlation and presentation of factual data."[19]

17. Available in the late summer of 1937 and published in February 1938, the *Rio Grande Joint Investigation* report, or *JIR*, compiled a considerable amount of information. It described the Upper Rio Grande Basin's geography and known hydrology and surveyed all the important events leading to the investigation, beginning with the nineteenth-century protests over upstream depletion. Laying out the water resources problem of the basins, the monumental report offered data and 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

[16] "Report of the Rio Grande Board of Review," September 13, 1935, 1. Folder 390, Box 26, FAC, WRCA.

[17] "Report of the Rio Grande Board of Review," September 13, 1935, 8. Folder 390, Box 26, FAC, WRCA; and 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.

[18] "Report of the Rio Grande Board of Review," September 13, 1935, 10. Folder 390, Box 26, FAC, WRCA.

[19] "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.

Mexico's Middle Rio Grande Valley above San Marcial, and the lands between Elephant Butte and Ft. Quitman – all to assist in apportioning the Rio Grande waters to meet present and future needs in these sections.[20]

18. With information from the *JIR*, the Rio Grande Compact 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 a Compact that was adopted in March 1938 and apportioned the waters of the Rio Grande.[21] Central to that apportionment were two delivery schedules for the basin's three sections: one for Colorado to New Mexico near the state line (Article III), and another for New Mexico to Texas at the head of Elephant Butte Reservoir (Article IV).[22] These delivery points were effectively the same points that the 1929 compact had used to restrict depletions. These 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."[23]

19. Upstream depletions have continued to be a source of conflict despite the Compact. On two prior occasions, Texas has defended its downstream supply against the upstream states. In 1951, the state revived its suit against New Mexico and MRGCD, alleging once again that district operations were diminishing flows that should reach Elephant Butte

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[20] Proceedings of the Meeting of the Rio Grande Compact Commission Held in Santa Fe, New Mexico, September 27, to October 1, 1937, 1 and 6-8. Unnamed folder 5, Box 2F463, Rio Grande Compact Comm'n. Frank B. Clayton Papers [hereafter RGCC-FBCP], UTA; and *JIR*, 7-18 and passim.

[21] 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 Hinderlider Collection, 1897-1987 [hereafter MCHC 1897-1987], History Colorado, Denver [hereafter HC]; and "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.

[22] "Rio Grande Compact," Article III and Article IV, in Proceedings of the Meeting of the Rio Grande Compact Commission . . . March 3rd to March 18th, inc., 1938, Appendix No. 11, 74-78. ff. 032.1, Box No. 936, Entry 7, RG 115, NARA Denver.

[23] Tipton, *Analysis*, 6. ff. 70, Box 44-70, MCHC 1897-1987, HC.

pursuant to the Compact.[24] 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 the waters available downstream.[25]

"PRESENT CONDITIONS" AND "PRESENT USES" IN 1938 STRUCTURED THE "EQUITABLE APPORTIONMENT" OF THE WATERS OF THE RIO GRANDE IN THE UPPER RIO GRANDE BASIN AMONG THE STATES OF COLORADO, NEW MEXICO, AND TEXAS

20. "Present conditions" and "present uses" in 1938 structured the "equitable apportionment" of the waters of the Rio Grande in the Upper Rio Grande Basin among the states of Colorado, New Mexico, and Texas. In developing the basis for an apportionment in the fall of 1937, the Rio Grande Compact 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.[26] They concurred 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, and did not consider the development of groundwater as an additional source of supply.[27]

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[24] In the Supreme Court of the United States, October Term, 1951, No. . . . , Original, *State of Texas, Plaintiff, v. State of New Mexico, et al. Defendants, Motion for Leave to File Complaint and Complaint*, 2-3, and 10-14. The complaint was eventually "dismissed because of the absence of the United States as indispensable party. 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.

[25] In the Supreme Court of the United States, October Term, 1966, No. . . . , Original, *State of Texas and State of New Mexico, Plaintiffs, v. The State of Colorado, Defendant, Motion for Leave to File Complaint and Complaint*, 2-3, and 5-7. This suit was ultimately settled by the states out of court. Vince Taylor, "Colorado's Snow Melt Reaching El Paso: A Status Report on No. 29 Original, U.S. Supreme Court," *Texas Bar Journal* (October 1968): 831-832, 871-872, and 874. ff. B-12.2.6.3 Tri-State Rio Grande Compact Commission 4 of, Oct 1966 thru Mar 1977, Box 6-25, Acc #076-89-0004 6-25, Records of Boundary and Claims Commissions and Arbitrations, Record Group 76, National Archives at Ft. Worth, Texas.

[26] "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 March 18th, inc., 1938, Appendix No. 1, 47. ff. 032.1, Box No. 936, Entry 7, RG 115, NARA Denver.

[27] Raymond A. Hill, Memo to Mr. Clayton: In re Meeting of Committee of Engineers, at Santa Fe, November 22 to 24, 1937, November 26, 1937, 3. [1937], Box 2F467, RGCC-FBCP, UTA; 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,

21. The engineers instead focused on distributing the known available water supply to meet existing demands for that water – as Tipton put it, "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, and at Elephant Butte Reservoir, later the San Marcial gaging station.[28]

22. What constituted "present conditions" varied for each upstream section, but each was predicated on data and analyses from the *JIR*. For Colorado's delivery to New Mexico (Article III), those "present conditions" were reflected in the waters reaching the Lobatos "the period 1928 to 1937."[29] Stream flow data and analyses in the *JIR* had suggested a stability in 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 proposed developments in the valley.[30]

23. For New Mexico's delivery schedule to Texas (Article IV), those "present conditions" were reflected in the waters reaching San Marcial for "the period prior to 1930."[31] The engineering advisors initially considered a schedule based on Otowi Bridge-San Marcial

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inc., 1938, Appendix No. 1, 47. ff. 032.1, Box No. 936, Entry 7, RG 115, NARA Denver.

[28] Tipton, *Analysis*, 5-6. ff. 70, Box 44-70, MCHC 1897-1987, HC. 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 of Texas vs. State of New Mexico*, et al, AG No. 51-238, Box 1991/17-188, LF-TAG, TSA.

[29] Tipton, *Analysis*, 6. ff. 70, Box 44-70, MCHC 1897-1987, HC.

[30] *JIR*, 29-30; and Tipton, *Analysis*, 5. ff. 70, Box 44-70, MCHC 1897-1987, HC.

[31] "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.

relationship for the period roughly between 1912 and 1935, a schedule developed by Hill.[32] According to the *JIR*, the relationship between flows at Otowi Bridge at the head of the Middle Rio Grande Valley and at San Marcial suggested a stability in consumptive use above San Marcial for the period between 1890 and 1935 similar to that found in the San Luis Valley for the period 1927 to 1935. The report, however, acknowledged that the data of tributary inflow between Otowi and San Marcial was poor, and that the impact of MRGCD's operations on downstream flows was difficult to assess.[33] The engineers subsequently decided 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."[34]

24. Objections to this Otowi Bridge-Elephant Butte schedule made by the New Mexico compact commissioner Thomas McClure, prompted by criticisms raised by MRGCD's consulting engineer H.C. Neuffer, led the engineering advisors in March 1938 to return to an Otowi Bridge-San Marcial relation (excluding the months of July, August, and September) "for the period prior to 1930."[35] As later explained by Bliss and McClure, this

[32] Proceedings of the Meeting of the Rio Grande Compact Commission . . . September 27, to October 1, 1937, 20. Untitled folder 5, Box 2F463, RGCC-FBCP, UTA.
[33] *JIR*, 42-43.
[34] Preliminary Draft of Report of Committee to Rio Grande Compact Commissioners, December 22, 1937, 5. CB-F-137-34, Box 4X215, RAHP, UTA; Tipton, *Analysis*, 6. ff. 70, Box 44-70, MCHC 1897-1987, HC; 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.
[35] 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; H.C. Neuffer, Consulting Engineer, to Mr. John H. Bliss, State Engineer's Office, Re: Report of Committee of Engineers to Rio Grande Compact Commissioners, December 27, 1937, January 7th, 1938. NM_00054005; [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.

different time scale avoided the effects of development in the MRGCD since 1929.[36] Nevertheless, according to Bliss, "[t]he Compact recognize[d] by implications, in several of its provisions storage in Elephant Butte reservoir" – and waters for the Rio Grande Project which served lands in Texas – were "prior in right to storage in reservoirs constructed in the Rio Grande basin after 1929."[37]

25. These schedules effectively froze upstream depletions to "present conditions" that would not compromise "present uses" downstream, circa 1938. The potential for increased upstream depletions were strictly addressed through a system of credits and debits, adopted as Article VI, and were ultimately contingent on downstream uses being met.[38] Colorado, pursuant to this credits-and-debits system, was permitted to pursue post-1937 reservoir construction.[39] Similarly, New Mexico, like Colorado, could depart from its delivery schedule; it could hold water in "reservoirs constructed after 1929" pursuant to the Article VI credits-and-debits system.[40] 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

[36] 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]; and Thomas B. McClure, State Engineer, "Analysis of the Compact," undated, 21. NM_00164500.

[37] Bliss, "Provisions of the Rio Grande Compact," 4. ff. Rio Grande Compact Engineer-Adviser Data, 1937-1938, Box No. 27, Accession Number 7978, JHBC, AHC.

[38] "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.

[39] "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, 74-76 and 78-79. ff. 032.1, Box No. 936, Entry 7, RG 115, NARA Denver.

[40] "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, 74-76. ff. 032.1, Box No. 936, Entry 7, RG 115, NARA Denver.

"reservoirs constructed after 1929" to satisfy accrued debits.[41] Correspondingly those debits were forgiven when "actual spill" from Elephant Butte occurred.[42]

26. The "present uses" for the apportioned Rio Grande water were left unstated in the Compact, but the positions articulated by the states throughout the Compact negotiations leave little doubt that these uses encompassed the plans Colorado had for its San Luis Valley, New Mexico's Middle Rio Grande development, and the Rio Grande Project through which Texas obtained its apportioned water. For the Project in particular, as Bliss suggested, various Compact provisions recognized its essential importance and protected it. Article IV required "appropriate adjustments" to be made to New Mexico's delivery schedule at San Marcial for "depletion after 1929 . . . at any time of the year of the natural runoff at Otowi Bridge" and "depletion of the runoff during July, August, and September of tributaries between Otowi Bridge and San Marcial by works constructed after 1937." Article VII limited the amount of water the two upstream states could store in post-1929 reservoirs to ensure a minimum amount of water in Rio Grande "project storage." Article VIII further provided for an average or "normal release of 790,000 acre-feet" from Rio Grande Project storage.[43]

27. United States compact commissioner S.O. Harper also believed the Compact was inclusive of the Project's water supply. Days following the conclusion of the Compact negotiations, he informed the Secretary of the Interior that not only was the Compact "an eminently fair and equitable solution" but also that U.S. "interests" were "fully safeguarded" in the Compact, in part as a result of the "inclusion, in the State allocations, of all water to which Federal irrigation projects are entitled."[44]

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[41] "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.

[42] "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, 73 and 78-79. ff. 032.1, Box No. 936, Entry 7, RG 115, NARA Denver.

[43] "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, 77-78 and 79-80. ff. 032.1, Box No. 936, Entry 7, RG 115, NARA Denver.

[44] S.O. Harper, Chairman, Rio Grande Compact Commission, to The Honorable, The Secretary of the

28. 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 the original action 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."[45]

THE WATER APPORTIONED TO TEXAS BY THE 1938 COMPACT WAS THE WATER TO BE DELIVERED BY NEW MEXICO TO SAN MARCIAL, SUFFICIENT TO ENABLE "A NORMAL RELEASE OF 790,000 ACRE-FEET" OF WATER FROM RIO GRANDE PROJECT STORAGE

29. The water apportioned to Texas by the 1938 Compact was the water to be delivered by New Mexico to San Marcial, sufficient to enable "a normal release of 790,000 acre-feet" of water from Rio Grande Project storage.[46] BOR pursued the Project in the early 1900s to mollify water users in Mexico, New Mexico, and Texas. Those users all protested upstream diversions in Colorado, contending that those diversions had deprived them of the flows that until the late-nineteenth century had reached their lands. Initially, an "international dam" at El Paso was contemplated to supply both the United States and Mexican irrigators. Subsequent assessment by federal engineers, however, identified a dam site at the geological formation in New Mexico known as Elephant Butte – more than 100 miles from the present New Mexico-Texas state line – as providing the opportunity to water the most land within the United States while also serving Mexico. Presented to the 1904 National Irrigation Congress

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Interior, Washington, D.C., Re: Rio Grande Compact, March 26, 1938, 2. ff. 032.1 Box No. 936, Entry 7, RG 115, NARA Denver.

[45] In the Supreme Court of the United States, October Term 1967, No. 29, Original, *State of Texas and New Mexico, Plaintiffs, vs. State of Colorado, Defendant,* Deposition of: Raymond A. Hill, Taken December 4, 1968, Denver, Colorado, 36. ff. *Texas & New Mexico v. Colorado*, w. *Texas vs. Colorado* 66-1061, Box 1989 41-240, LF-TAG, TSA.

[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.

in El Paso, the proposed Elephant Butte Dam received the endorsement of delegates from Mexico, New Mexico, and Texas.[47]

30. Although there were two separate irrigation districts that contracted for the water appropriated for the Project, Elephant Butte Irrigation District ("EBID") in New Mexico and El Paso County Water Improvement District No. 1 ("EP #1") in Texas, BOR treated the Project "as an administrative unit" in Clayton's words.[48] Project infrastructure was built largely without regard to state boundaries, and diversions to serve lands in Texas were made within New Mexico.[49]

31. These circumstances shaped the Compact. Both McClure and Bliss acknowledged, as Clayton had, that the "Project must be operated as a unit."[50] Consequently, as Bliss noted in recommending the Compact's adoption, "no schedule of releases from Elephant Butte Project storage" was provided aside from the 790,000-af "normal release" provision (Article VIII).[51]

32. 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

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[47] *International Dam in Rio Grande River, Near El Paso, Tex.*, 54th Cong., 1st sess., 1896, H. Doc. 125, 1-6; Guy Elliott Mitchell, ed., *The Official Proceedings of the Twelfth National Irrigation Congress, Held at El Paso, Texas, Nov. 15-16-17-18, 1904* (Galveston, TX: Clarke & Courts, 1905), 107-109 and 214-216; and B.M. Hall, Supervising Engineer, U.S. Reclamation Service, "A Discussion of Past and Present Plans for Irrigation of the Rio Grande Valley," November 1904, 3-8, and 56-57. ff. 46 Rio Grande Project. Penasco Rock Resv. Site-Elephant Butte Resv. Site, 1904-1905, Box No. 792 Rio Grande 17-46, Entry 3, RG 115, NARA Denver.

[48] Frank B. Clayton, Rio Grande Compact Commissioner for Texas, to Mr. Sawnie B. Smith, October 4, 1938, 1. Box 2F466, RGCC-FBCP, UTA.

[49] Clayton to Smith, October 4, 1938, 1. Box 2F466; 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.

[50] Thomas B. McClure, State Engineer, "Analysis of the Compact," undated, 21-22. NM_00164500; 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.

[51] Bliss, "Provisions of the Rio Grande Compact," 1 and 3. ff. Rio Grande Compact Engineer-Adviser Data, 1937-1938, Box No. 27, Accession Number 7978, JHBC, AHC.

[52] Raymond A. Hill to Mr. Frank B. Clayton, February 8, 1938. Box 2F466; and *Proceedings of Meeting Held on Friday, May 27, 1938*, 10 and 11. ff. Proceedings and Minutes 1935-1938, Box 2F463, RGCC-FBCP, UTA.

and Texas acknowledged that "New Mexico's obligations . . . must be in reference to deliveries at Elephant Butte reservoir [i.e., San Marcial]," as Clayton explained to attorney Sawnie Smith in October 1938. Federal control of the dam and Project works, spanning across New Mexico and Texas, anticipated to continue, defeated any effort to establish obligations for the upstream states for a specific quantity of water to Texas in 1938. "[N]either Colorado nor New Mexico," the Texas commissioner stressed, "could be expected to guarantee any fixed deliveries at the Texas line" owing to those circumstances.[53] Clayton made this same point to state representative Homer L. Leonard in August 1938, observing that the upper states' "only responsibility was to see that Texas' equitable share was delivered at the state line, or, rather, delivered into Elephant Butte reservoir, which is the point of control."[54] San Marcial was thus the *de facto* state line delivery to Texas.[55]

33. Texas concentrated on safeguarding the Rio Grande Project water supply throughout the Compact negotiations for only through the Project did Rio Grande waters reach lands in Texas. It was joined in this effort by EBID in New Mexico. The shared interest of EBID and Texas in limiting depletions above Elephant Butte reflected their mutual dependence on the waters captured and released from the dam. Clayton pointed this out to water users in Texas below Ft. Quitman in May 1938, telling them, "[a]s far as they [EBID] and we are concerned, our source is the same. If the supply is impaired above Elephant Butte, we all suffer alike."[56]

34. Water released from the federal dam to serve lands in EBID under federal contract formed a portion of the water supply to Texas, manifesting as return flows to the channel or in Project drains once those waters had been used within New Mexico. In the

[53] Clayton to Smith, October 4, 1938, 1. Box 2F466, RGCC-FBCP, UTA.
[54] Frank B. Clayton, Rio Grande Compact Commissioner for Texas, to Hon. Homer L. Leonard, August 3, 1938, 2. Box 2F466, RGCC-FBCP, UTA.
[55] *Proceedings of Meeting Held on Friday, May 27, 1938*, 10, 11, and 15. ff. Proceedings and Minutes 1935-1938, Box 2F463, RGCC-FBCP, UTA.
[56] *Proceedings of Meeting Held on Friday, May 27, 1938*, 11. ff. Proceedings and Minutes 1935-1938, Box 2F463, RGCC-FBCP, UTA.

1910s, federal engineers and BOR officials recognized that return flows could help meet downstream demands.[57] Although such flows became of poorer quality (higher in salts) down through the Project, both Project lands in the El Paso Valley of Texas in EP #1 and lands in Hudspeth County outside the Project were dependent upon return flows by the 1920s.[58] Water users within Hudspeth County Conservation and Reclamation District No. 1 ("Hudspeth") were permitted by a federal Warren Act contract to divert water passed beyond the Project only when those waters were "available."[59] However, Project releases from Elephant Butte to EP #1 intended to improve the quality of water reaching EP #1 lands indirectly benefitted Hudspeth.[60]

35. Reliance on return flows within and from the Project explains why Texas in October 1937 asked that Colorado and New Mexico "release and deliver at San Marcial a supply of water sufficient to assure the release annually from Elephant Butte Reservoir of

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[57] United States Congress, House of Representatives, *Fund for Reclamation of Arid Lands: Message from the President of the United States, Transmitting a Report of the Board of Army Engineers in Relation to the Reclamation Fund*, H. Doc. No. 1262, 61st Cong. 3d sess. (1911-12), 106; "Water Supply of Rio Grande, from Official Records, 1912," 4-5, enclosed with A.P. Davis, Chief Engineer, Memorandum for Secretary Lane, April 17, 1913. File 8-3 (Part 4) Reclamation Service, Rio Grande Project, New Mexico, Rio Grande River, Distribution of Waters, Nov. 21, 1912 – Apr. 17, 1914, Box No. 1639 8-3, Rio Grande D-E, CCF 1907-1936, RG 48, NARA II; and Harold Conkling, Engineer, and Erdman Debler, Asst. Engr., Water Supply for and Possible Developments on Irrigation and Drainage Projects on the Rio Grande River Above El Paso, Texas, June-1919, 110-112. ff. 302.31, New Mexico. Report dated June 1919 by Conkling and Debler on Water Supply for and Possible Developments on Irrigation and Drainage Projects on the Rio Grande River Above El Paso, Texas, transmitted by letter July 15, 1919, Box 262 302.28--302.31 A. NV-NM, Entry 7, RG 115, NARA Denver.

[58] E.B. Debler, Engineer, Bureau of Reclamation, "Return Flow and Its Problems on Reclamation Projects," *New Reclamation Era* (August, 1927), 125. ff. 030.1, Box 33, General Files, 1919-1929, Entry 7, RG 115, NARA Denver, and *JIR*, 85-86, 99-104, and 403.

[59] Contract, Ilr-493, Hudspeth County Conservation & Reclamation District, December 1, 1924, Department of the Interior, Bureau of Reclamation, Contract Between the United States and Hudspeth County Conservation and Reclamation District No. 1, Providing for the Rental of Water to the District, December 1, 1924, 2. ff. 223.02 Rio Grande Water, Hudspeth County Conservation & Reclamation District, Transfer Case, Thru 1929, Box 907 Rio Grande 223.02, Entry 7, RG 115, NARA Denver.

[60] *Proceedings of Meeting, held on Friday, May 27, 1938*, 16, 17, and 25. ff. Proceedings and Minutes 1935-1938, Box 2F463, RGCC-FBCP, UTA; and L.R. Fiock, Superintendent to Commissioner, Subject: Protest of Hudspeth County Conservation and Reclamation District No. 1 – Rio Grande Project, May 22, 1939, 4. ff. 301 Rio Grande Project - Board and Engineering Report on Construction Features, Jan 1, 1937, Box 927 Rio Grande Pro. 246. - 301., Entry 7, RG 115, NARA Denver.

800,000 acre-feet of the same average quality as during the past ten years . . . ."[61] This was a figure that Hill had calculated would provide lands in Texas with a sufficient quantity and quality of water while also meeting the Mexican treaty obligation.[62] The *JIR* and Bliss assessed lower quantities for Texas but both appreciated the importance of return flows for lands in the downstream state. The *JIR* offered 773,000 af as a "conservative estimate," with "necessary allowances for drain flow, wastes, arroyo inflow, and "salinity control."[63] During the engineering advisors' meetings in late 1937, Bliss estimated 750,000 af as sufficient for the Elephant Butte-Ft. Quitman section, and made provision for water to Hudspeth (water that would have included return flows from upstream diversions) and the achievement of a "salt balance" down to Ft. Quitman (recognition that lands downstream relied on poor-quality return flows).[64]

36. The engineering advisors initially agreed to an 800,000-af release, linking this release to a delivery schedule based on an Otowi Bridge-Elephant Butte relationship, before revising this figure downward along with changing the schedule in March 1938.[65] As with the change to the delivery schedule, criticism by Neuffer led to this revision. The MRGCD consulting engineer believed that a 700,000-af release from Elephant Butte was "liberal," but was willing to accept as much as a 750,000 af release. Despite not making specific provision for lands outside the Project, Neuffer's own allowances for "[u]navoidable project wastes

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[61] Proceedings of the Meeting of the Rio Grande Compact Commission . . . September 27, to October 1, 1937, 13. Untitled folder 5, Box 2F463, RGCC-FBCP, UTA.

[62] *State of Texas vs. State of New Mexico, et al*, *Plaintiff's Case in Chief*, Volumes V, VI & VII, 1202-1206, 1220-1221, and 1235-1236. CB-F-171A thru CB-F-1716: Transcripts of TX v. NM, Vol. 1-16, Box 4X219, RAHP; and Hill to Clayton, November 26, 1937, 2. [1937], Box 2F467, RGCC-FBCP, UTA.

[63] *JIR*, 103-104.

[64] [Raymond Hill], "TEXAS COMPACT: John Bliss Estimate of Project Requirements at Elephant Butte," 12/17/37, and "John Bliss Estimate of Project Requirements at Elephant Butte," typescript, n.d. CB-F-137-34, Box 4X215, RAHP, UTA.

[65] "Report of Committee of Engineers to Rio Grande Compact Commissioners," December 27, 1937, in Proceedings of the Meeting of the Rio Grande Compact Commission, Held at Santa Fe, New Mexico, March 3rd to March 18th, inc., 1938, Appendix No. 1, 45. ff. 032.1, Box No. 936, Entry 7, RG 115, NARA Denver. Both the 800,000-af release and the later 790,000-af release (as discussed below) were subject to the 60,000-af Mexican treaty obligation.

below Riverside heading" and "[w]inter discharge of Project drains in New Mexico not redivertable" in that release figure would have entailed return flows for lands in Hudspeth.[66]

37. New Mexico's actions in the Compact negotiations demonstrated little concern about lands below Elephant Butte; it instead focused on the lands above San Marcial. With Texas advocating for the Rio Grande Project water supply, New Mexico appeared willing to cede EBID's interests to Texas in order to secure water for the Middle Rio Grande.[67] McClure's responsiveness to Neuffer's opposition to the higher release figure and the original schedule – both of which would have benefitted EBID – is indicative of this. Hinderlider and Clayton were critical of their New Mexico counterpart for listening to the MRGCD engineer, with the latter insisting to Harper in January 1938 that McClure "seems to lose sight of the fact that there is a very extensive section of his own State lying below the Elephant Butte dam . . . ."[68]

38. In March 1938, Texas agreed to a smaller figure of 790,000 af for a "normal release," or average release, and this was adopted as Article VIII in the Compact along with the new delivery schedule (Article IV).[69] Thirty years after the Compact had been signed, Hill explained that the 790,000 af figure recommended by him and his fellow engineers and adopted in the Compact was 730,000 af "for uses in the United States and sixty [thousand] for uses in Mexico . . . ."[70] Those "uses in the United States" were the "present uses" at the time of the Compact.

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[66] Neuffer to Bliss, January 7th, 1938. NM_00054005; and Neuffer, Memorandum, January 6, 1938, np [2-3, and 6]. NM_00156901 – NM_00156902 and NM_00156905.

[67] Hill to Clayton, February 8, 1938. Box 2F466, Box 2F463, RGCC-FBCP, UTA.

[68] Frank B. Clayton, Rio Grande Compact Commissioner for Texas, to Mr. S.O. Harper, Chairman, Rio Grande Compact Commission, January 27, 1938; and M.C. Hinderlider, Commissioner for Colorado, to S.O. Harper, Chairman, Rio Grande Compact Commission, February 4, 1938. ff. 032.1, Box No. 936, Entry 7, RG 115, NARA Denver.

[69] "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, 65; and "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.

[70] Deposition of Raymond A. Hill, Taken December 4, 1968, Denver, Colorado, 18. ff. Texas & New Mex. v. Colo., w. 66-1061 Texas vs. Colorado, Box 1989 41-240, LF-TAG, TSA.

39. This release figure consequently constrained the Rio Grande waters apportioned to Texas. The water supply the City of El Paso obtained from Elephant Butte in the early 1940s illustrates this. Because the apportionment was defined consistent with the Project, El Paso was only able to secure this water through the acquisition of Project lands within EP #1.[71] Releases from the federal dam in accordance with Project operations would have served those EP #1 lands with water, by direct diversion and return flows, as of 1938.

40. The same Compact provisions that protected the Project against upstream depletions ensured that Texas would receive its apportionment. A 790,000-af average release from Elephant Butte; adjustments to be made in New Mexico's delivery to San Marcial for increased depletions after 1929 at Otowi Bridge and "for works constructed after 1937" above San Marcial (Article IV); and limitations on the water that Colorado and New Mexico could store above San Marcial "in reservoirs constructed after 1929" to provide a minimum amount of "project storage" (Article VII) all assured Texas some water via the Project. Article VIII, moreover, gave the Texas Rio Grande Compact Commissioner the sole authority to call for releases from post-1929 reservoirs in Colorado and New Mexico that would result in a 790,000-af release – underscoring Texas's dependence on the waters to be delivered to Elephant Butte and delivered by the Project.[72]

41. The absence of a state-line delivery requirement confounded some in Texas below Ft. Quitman who expected the Compact to apportion the Rio Grande down to the Gulf

[71] H.W. Bashore, Acting Commissioner, to Mr. W.E. Robertson, Chairman, Water Development Commission of the City of El Paso, Jul 25, 1940; Memorandum for Mr. Stinson (Harrell), Subject: Rio Grande Project – Sale of water to City of El Paso for supplemental supply for Municipal purposes, January 17, 1941, 2-4. ff. 223.02 Rio Grande – Leases, Sales & Rentals of Water, El Paso, City of, thru Dec 1941, Box 920 Rio Grande Pro. 223.02, Entry 7, RG 115, NARA Denver; John C. Page, Commissioner, to The Secretary of the Interior, Feb 17, 1941; and J. Kennard Cheadle, Acting Commissioner, to The Secretary of the Interior, Nov 22, 1944. File No. 8-3 (Part 8), Reclamation Bureau, Rio Grande Project, Distribution of Waters, General, January 27, 1937 thru February 10, 1950, 8-3 Rio Grande-Distribution-Waters-General, Box 3623 8-3 Rio Grande-Contracts-Nelson, J.P. 8-3 Rio Grande Flood Control, Central Classified Files, 1937-1953, RG 48, NARA II.

[72] Proceedings of the Meeting of the Rio Grande Compact Commission . . . March 3rd to March 18th, inc., 1938, 31-33; and "Rio Grande Compact," Articles IV, VII, and VIII, in Proceedings of the Meeting of the Rio Grande Compact Commission . . . March 3rd to March 18th, inc., 1938, Appendix No. 11, 77-78, 79, and 80. ff. 032.1, Box No. 936, Entry 7, RG 115, NARA Denver.

of Mexico. Yet, for Clayton the matter was clear. His "duty," as he informed lower Rio Grande water users in May 1938, "[was] to see Texas got every drop of water originating in Colorado and New Mexico that she was entitled to and to see that that water was delivered into the Elephant Butte Reservoir," and "[b]y that compact [i.e., the Compact of 1938] Texas got all she was entitled to. . . ."[73]

42. That entitlement, Clayton emphasized to lower Rio Grande water users and their representatives, was for water for lands above Ft. Quitman. In explaining to Smith in particular in October 1938 why there was no state line delivery for Texas, the compact commissioner also pointed to existing federal contracts for water from the Project – the contracts between the United States and EBID and EP #1 as well as the contract between EBID and EP #1 and Hudspeth's Warren Act contract – as providing further assurance that those lands would receive their due.[74]

43. The contracts involving the United States, EBID, and EP #1, referenced by Clayton and identified by the Supreme Court in this original action as the "Downstream Contracts," however, did not prescribe specific quantities of water to either Project district. The Downstream Contracts, executed contemporaneous with the Compact, were: (1) the November 9, 1937 United States-EBID contract, (2) the November 10, 1937 United States-EP #1 contract, and (3) the February 16, 1938 EBID-EP #1 contract. All these agreements primarily concerned the obligations of EBID and EP #1 to repay the federal investment in the Project, pursuant to the 1902 Reclamation Act, its subsequent amendments, and the 1905 act authorizing the Project.[75]

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[73] *Proceedings of Meeting, held on Friday, May 27, 1938*, 10. ff. Proceedings and Minutes 1935-1938, Box 2F463, RGCC-FBCP, UTA.

[74] Clayton to Smith, October 4, 1938, 1. Box 2F466, RGCC-FBCP, UTA.

[75] Contract Dated Nov. 9, 1937, Ilr-982, Elephant Butte Irrigation District (Adjustment of project construction charges and other purposes), United States, Department of the Interior, Bureau of Reclamation, Rio Grande Project, New Mexico-Texas, Contract between the United States and the Elephant Butte Irrigation District adjusting construction charges and for other purposes. ff. 222.- Rio Grande Project. Contracts with Elephant Butte Irrigation District, Separate Folder, Box No. 917, Rio Grande Pro. 222._222.-; Contract Dated Nov. 10, 1937, Ilr-981, El Paso County Water Improvement District No. 1 (Adjustment of project construction charges and other purposes), United States,

44. The 1902 Reclamation Act, or Newlands Act, created a federal program to irrigate the arid West through the construction of large-scale irrigation projects. Water users within these projects were required to repay the United States for the costs of construction over a period of years.[76] On the Rio Grande Project, the repayment obligation was dealt with first in a 1906 agreement between the United States and the Elephant Butte Water Users Association and the El Paso Valley Water Users Association, and then later in individual contracts to both districts in 1918 and 1920 following the dissolution of these associations.[77]

45. Agricultural surpluses in the 1920s and the Great Depression of the 1930s undercut farming prices and undermined the ability of users to meet their repayment obligations.[78] Congress thus amended reclamation law to provide relief to Project water users.[79] These amendments paved the way for the Downstream Contracts. In their 1937

Department of the Interior, Bureau of Reclamation, Rio Grande Project, New Mexico-Texas, Contract between the United States and the El Paso County Water Improvement District No. 1, adjusting construction charges and for other purposes. ff. 222.- Rio Grande Project. Irrigation Districts, El Paso County Water Improvement District No. 1, Separate Folder, Box No. 918 Rio Grande Pro. 222._222.-; and Contract between Elephant Butte Irrigation District of New Mexico and El Paso County Water Improvement District No. 1 of Texas, signed February 16, 1938, and approved by Assistant Secretary of the Interior Oscar L. Chapman, April 11, 1938. ff. 400. Rio Grande, Lands-General, 1930 thru, Box 932 Rio Grande Pro. 400.__400.08, Entry 7, RG 115, NARA-Denver.

[76] *An Act Appropriating the receipts from the sale and disposal of public lands in certain States and Territories to the construction of irrigation works for the reclamation of arid lands*, June 17, 1902, chap. 1093, Public, No. 161, 32 Stat. 388.

[77] Articles of Agreement by and between the U.S., acting in this behalf by Jesse E. Wilson, Acting Secretary of the Interior, and the Elephant Butte Water Users' Association of New Mexico and the El Paso Valley Water Users' Association, June 27, 1906. ff. 330-B Rio Grande. Contracts with Elephant Butte Irri. Dist., Transfer Case, Box 817 Rio Grande 330B- -348C, Entry 3; Department of the Interior, Bureau of Reclamation, Rio Grande Project-New Mexico-Texas, Contract Dated June 15, 1918 – between The United States of America and The Elephant Butte Irrigation For Repayment of Construction and Operation and Maintenance Charges; and Department of the Interior, Bureau of Reclamation, Rio Grande Project-New Mexico-Texas, Contract Dated January 17, 1920 between The United States of America and The El Paso County Water Improvement District No. 1, For Repayment of Construction and Operation and Maintenance Charges, in Department of the Interior, Bureau of Reclamation, Rio Grande Irrigation Project, New Mexico-Texas, Contracts with Water User's Organizations (Copies), Compiled November 1, 1929. 232-29 RG Separate Folder, 249-H, Contracts with Water Users, Box 716 Old Box 509-510, Code 104.RG 37 through Code 402.RG 28, Engineering and Research Center, Project Reports, 1910-55 [hereafter PR 1910-55], RG 115, NARA Denver.

[78] Donald J. Pisani, *Water and American Government: The Reclamation Bureau, National Water Policy, and the West, 1902-1935* (Albuquerque: University of New Mexico Press, 1992), 149-150.

[79] *An Act For the temporary relief of water users on irrigation projects constructed and operated under the reclamation law*, April 1, 1932, 47 Stat. 75, chapter 94; *An Act To extend the operation of*

contracts with the United States, the districts relinquished their rights to hydroelectric power revenue from Elephant Butte in order to reduce their repayment obligations.[80] The 1938 contract executed between the two districts, and approved by the United States, memorialized the historical distribution of repayment costs for storage and general project features between EBID and EP#1 on the basis of the respective irrigated acreages, permitting a three-percent expansion in that acreage in any one year "to be subject to construction charges."[81]

46. For its part, New Mexico later directly acknowledged that the waters delivered to San Marcial, pursuant to the Compact, were for the benefit of lands in Texas above Ft. Quitman. In the state's reply to Texas's 1951 complaint in the Supreme Court, approved by former New Mexico engineering advisor and now New Mexico State Engineer John Bliss, it argued that the Compact "does not attempt to make an apportionment between the New Mexico area and the Texas area below Elephant Butte." This statement was evocative of Clayton, McClure, and Bliss's observations at the time of the Compact that the Project functioned as "an administrative unit" or "operated as a unit." New Mexico with Bliss's assent, however, went further in 1951. The state asserted that "the natural dependable flow of the river below San Marcial was over-appropriated in 1906," and in the absence of Project storage "no substantial quantity of water would be available for use in Texas."[82]

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the Act entitled, "An Act For the temporary relief of water users on irrigation projects constructed and operated under the reclamation law," approved April 1, 1932, March 3, 1933, 47 Stat. 1427, chapter 200.

[80] Contract Dated Nov. 9, 1937, Ilr-982, Elephant Butte Irrigation District (Adjustment of project construction charges and other purposes), Articles 3-5, 2-4. ff. 222.-, Box No. 917; Contract Dated Nov. 10, 1937, Ilr-981, El Paso County Water Improvement District No. 1 (Adjustment of project construction charges and other purposes), Article 3-5, 2-4. ff. 222.-, Box No. 918, RG 115, NARA Denver.

[81] Contract between Elephant Butte Irrigation District of New Mexico and El Paso County Water Improvement District No. 1 of Texas, signed February 16, 1938, 1. ff. 400. Box 932, Entry 7, RG 115, NARA-Denver.

[82] In the Supreme Court of the United States, October Term, 1951, No . . . ., Original, *State of Texas, Plaintiff, v. State of New Mexico, et al., Defendants, Return of Defendants to Rule to Show Cause* [December 15, 1951], 3 and 8. ff. RG 267 Entry 26 TX v. NM #9, Box 459 1957 (Begin TX v. MN #9) to 1957, Entry 26, RG 267, NAB.

THE HISTORICAL RECORD INDICATES THAT GROUNDWATER WAS NOT CONSIDERED A SOURCE OF WATER AUGMENTATION TO THE EXISTING SURFACE WATER SUPPLY AT THE TIME OF THE COMPACT – AND SINCE AT LEAST THE 1950S THE NEW MEXICO STATE ENGINEER HAS BEEN AWARE THAT GROUNDWATER PUMPING COULD DEPLETE SURFACE WATERS BELOW ELEPHANT BUTTE RESERVOIR

47. The historical record indicates that groundwater was not considered a source of water augmentation to the existing surface water supply at the time of the Compact – and since at least the 1950s, the New Mexico State Engineer has been aware that groundwater pumping could deplete surface waters below Elephant Butte Reservoir. Investigations prior to and following construction of Elephant Butte found that the surface flow of the Rio Grande and the surrounding groundwater were hydrologically connected. United States Geological Survey ("USGS") hydrologist Charles Slichter in 1904 was the first to identify this relationship in lower New Mexico's Mesilla Valley as part of the investigation leading to the Rio Grande Project. He informed the delegates to the 1904 National Irrigation Congress that the valley's groundwater derived from the Rio Grande itself.[83] An overlapping investigation by fellow USGS hydrologist Willis Lee released in 1907 concurred in Slichter's assessment.[84]

48. An independent study by New Mexico engineering advisor John Bliss, made at the suggestion of Rio Grande Project superintendent L.R. Fiock and provided to New Mexico State Engineer and Rio Grande Compact commissioner Thomas McClure in February 1936, uncovered a "direct relation" between surface flow and the surrounding groundwater downstream of the federal dam. At certain critical points between Elephant Butte and El Paso, Bliss found that Rio Grande underflow fed the groundwater table, providing basin lands

[83] Mitchell, ed., *The Official Proceedings,* 218. Slichter subsequently reiterated this finding in his published study in 1905. Charles S. Slichter, *Observations on the Ground Water of Rio Grande Valley*, Department of the Interior, United States Geological Survey Water-Supply and Irrigation Paper No. 141 (GPO, 1905), 27.

[84] Willis T. Lee, *Water Resources of the Rio Grande Valley in New Mexico and their Development*, Department of the Interior, United States Geological Survey Water-Supply and Irrigation Paper No. 188 (GPO, 1907), 41 and 49-50.

with additional water that was recovered by project drains and returned to the river channel for use on lands downstream.[85]

49. The interconnection between the surface flow of the Rio Grande and the groundwater was apparent in the "water logging" of Project lands, which made construction of drainage works necessary in Mesilla Valley the 1910s.[86] By returning excess ground water to the stream or otherwise making it available for lands downstream, drains ensured that the water table remained in balance, that the root zones of crops were not flooded.[87]

50. Groundwater pumping had occurred in the Mesilla Valley prior to the Project but declined as users opted for surface water deliveries from Elephant Butte.[88] The Project, in turn, came to rely upon the use of return flows from upstream diversions to meet irrigation demands to those lands furthest from Elephant Butte. In the early 1910s, as completion of the dam neared, federal authorities in recognition of the importance of these return flows asserted claims "to all waste, seepage, spring, and percolating water arising within the project" with the intent "to use such water in connection therewith."[89]

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[85] John H. Bliss, "Report on Investigation of Invisible Gains and Losses in the Channel of the Rio Grande from Elephant Butte to El Paso." Feb. 1936, 1-2 and 9-12. Folder 1435, Bliss, Report on Investigation of Invisible Gains and Losses in the Channel of the Rio Grande from Elephant Butte to El Paso, February 1936, Box 55, State Engineer Reports: Rio Grande, Exps. 161-163, Nos. 1417-1437, NMSRCA.

[86] Memorandum, From: Board of Engineers: E.H. Baldwin, Rio Grande Project Supervising Engineer; L.C. Hill, Consulting Engineer; D.W. Murphy, Engineer in charge of Drainage and L.M. Lawson, Project Manager, To: Reclamation Commission, Subject: Report on Drainage – Rio Grande Project, April 7, 1915, 2. Vol. 495, New Mex.-Texas, Rio Grande, Board of Engineers Report, ff. Rio Grande, 1904, Box 474 Rio Grande (NM-TX), Entry 10 Project Histories, Feature Histories, and Reports 1902-32 [hereafter Entry 10], RG 115, NARA Denver.

[87] Memorandum, From: Board of Engineers, To: Reclamation Commission, Subject: Report on Drainage – Rio Grande Project, April 7, 1915, 2-8. Vol. 495, Box 474, Entry 10; "Report on Mesilla & El Paso Valley Drainage, Rio Grande Project, February, 1917, 2-25. ff. Report on Mesilla & Rio Paso Valley Drainage Feb 1917; L.R. Fiock, Ass't Engineer, History of Drainage on the Rio Grande Project, To December 31st, 1918, Investigations, Plans and Estimates, Surveys and Construction, Chapter VI, Department of the Interior, United States Reclamation Service, Rio Grande Project – New Mexico, Texas, Annual History – 1918, in Department of the Interior, US Reclamation Service, Rio Grande Project, Texas New Mexico, Drainage. 530-18 RG, Box 723 [Old Box 512] Code 520 RG 14 through Code 550 RG 42, PR 1910-55, RG 115, NARA Denver.

[88] C. S. Conover, *Ground-Water Conditions in the Rincon and Mesilla Valleys and Adjacent Areas in New Mexico*, Geological Survey Water-Supply Paper 1230, Prepared in cooperation with the Elephant Butte Irrigation District, Department of the Interior (GPO, 1954), 9.

[89] *Twelfth Annual Report of the Reclamation Service, 1912-1913* (GPO, 1914), 176. U.S. Department

51. There is little evidence that federal or state engineers in the years leading up to the Compact conceptualized underlying groundwater as a separate, independent supply for the Mesilla Valley or the basin. Those that contemplated the possibility of groundwater extraction to expand Project lands in the 1910 and 1920s noted that pumping would deplete the available surface supply.[90] Neither the Board, the *JIR*, nor the Rio Grande Compact engineering advisors considered groundwater as a solution to the basin's strained supply.

52. The *JIR* did make some broad observations about the interdependence of groundwater and surface flows in the basin, indicative of Slichter, Lee, and Bliss's findings. "[E]xtensive development of ground water," it noted, "would add no new water to the Upper Rio Grande Basin," and "recharge of ground-water basin would necessarily involve a draft on surface supplies which are now utilized otherwise." The *JIR* further cautioned that "redistribution of the availability and use of present supplies and the resulting effect upon the water supply of lower major units [i.e., the Rio Grande Project and beyond to Ft. Quitman]" would have to be taken into account if groundwater was developed.[91]

53. The *JIR* also discussed groundwater pumping by "cities, towns, and villages" in the basin. Although municipal water use was modest when compared to irrigation diversions for agriculture in the 1930s, it was considered "a stream flow depletion" and factored into assessments of water use for the three sections of the basin. In evaluating the Middle Rio Grande's water uses, for instance, the investigation included the City of Albuquerque because its wells were "undoubtedly a draft, direct or indirect, on the Rio

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of the Interior, *14th Annual Report of the Reclamation Service, 1914-1915* (Washington: Government Printing Office, 1915), 215; and U.S. Department of the Interior, *17th Annual Report of the Reclamation Service, 1917-1918* (Washington: Government Printing Office, 1918), 251.

[90] Memorandum, From: Engineer Harold Conkling, To: Chief of Construction, Subject: Water Supply – Rio Grande River, June 18, 1919, 17-19. ff. 302.31 New Mexico. Surveys and Investigations. THRU 1929, Box 262 NV-NM 302.28- -302.31 A, Entry 7, RG 115, NARA Denver; and D.C. Henny to Mr. J.W. Taylor, President, Elephant Butte Irrigation District, January 9, 1926, 1-2 and 10. 19260109_NMSU-EBID_02-G_001_07.

[91] *JIR*, 56.

Grande." Communities in lower New Mexico were similarly figured into the water use for the basin's Elephant-Butte-Ft. Quitman section.[92]

54. Knowledge of the interrelationship between groundwater and stream flow grew in the years following the Compact and before significant groundwater development occurred. Detailed investigation by USGS hydrologist C.S. Conover in the late 1940s and early 1950s came to the same specific conclusions for the Rincon and Mesilla valleys of lower New Mexico that the *JIR* had generally arrived at for the basin. Conover's study, made at the request of EBID to assess the use of groundwater as the surface supply dwindled in the face of drought, was provided in preliminary form to the New Mexico State Engineer in 1947, with the final report published in 1954.[93] Conover, like Slichter, Lee, and Bliss before him, noted that the Rio Grande surface flow and surrounding groundwater were hydrologically connected. The hydrologist found that the two were in a state of balance in lower New Mexico, owing to the Project's drainage system. He did not believe that extracting groundwater could then permanently augment the existing surface supply, but rather would diminish it over time – particularly for those lands further downstream that were reliant upon return flow from drains.[94] "Pumping of ground water," as Conover put it in his final report, was "essentially a change in point of diversion of an existing supply."[95]

55. There is evidence that during the 1950s drought, both BOR and EBID appreciated the connection between surface flow and groundwater that Conover had

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[92] *JIR*, 104-105. The investigation did not include the City of El Paso in this assessment because its wells, unlike Albuquerque's and others in the basin, drew upon groundwater fed by precipitation east of the city. *JIR*, 105.

[93] Chas. V. Theis, District Geologist, to Mr. John L. Gregg, Manager, Elephant Butte Irrigation District, October 23, 1947, attached to Clyde S. Conover, U.S. Geological Survey, Preliminary memorandum on ground-water supplies for Elephant Butte Irrigation District, New Mexico, September 1947, NM_00124166; and C. S. Conover, *Ground-Water Conditions in the Rincon and Mesilla Valleys and Adjacent Areas in New Mexico*, Geological Survey Water-Supply Paper 1230, Prepared in cooperation with the Elephant Butte Irrigation District, Department of the Interior (GPO, 1954), 4-5.

[94] Conover, Preliminary memorandum, 1, 8, 12-15, 20-21, and 24-27. NM_00124167, NM_00124174, NM_00124178-NM_00124180, NM_00124167, NM_00124186-NM00124187, and NM_00124190-NM_00124193; and Conover, *Ground-Water Conditions*, 2, and 132-135.

[95] Conover, *Ground-Water Conditions*, 132.

documented in lower New Mexico. A 1952 BOR study of "river loss" above El Paso, for instance, found that groundwater pumping which had expanded to compensate for shortages in the surface supply was reducing both Rio Grande flows and return flows from drains.[96] Notably, in endorsing pumping during the drought, Project officials and EBID urged those Project water users with wells to "transfer" the water they otherwise would have received from Elephant Butte releases to those users without wells rather than continue to use both surface and ground waters.[97] When the drought broke and surface flows improved in the late 1950s, Project water users shifted away from groundwater pumping once more.[98]

56. Subsequent investigations took some exceptions to Conover's findings, but did not deny the interconnection between groundwater and surface flow in lower New Mexico and were attentive to the implications of groundwater development for lands below Elephant Butte. A 1961 New Mexico State University study by Narendra Gunaji, for instance, found that drain flows recovered more quickly with the reduction of pumping following the drought than Conover had predicted. This suggested use of groundwater "as a supplemental water supply" in drought years, yet Gunaji did not recommend "continued use and re-use of ground

[96] 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. NM_00138516.

[97] L.R. Fiock, "Rio Grande Project -- New Mexico-Texas, Water Announcement" (Department of the Interior, Bureau of Reclamation, August 1, 1951). JS000278; "Statement Issued by the Board of Directors of the Elephant Butte Irrigation District in Regard to the 1952 Water Situation" (Las Cruces, New Mexico: Elephant Butte Irrigation District, January 11, 1952). JS000280; L.R. Fiock, "Rio Grande Project -- New Mexico-Texas, Water Announcement" (Department of the Interior, Bureau of Reclamation, March 7, 1952). JS000281; L.R. Fiock, "Rio Grande Project -- New Mexico-Texas, Water Announcement" (Department of the Interior, Bureau of Reclamation, April 7, 1952). JS000282; "Statement from Elephant Butte Irrigation District Regarding the Water Situation" (Elephant Butte Irrigation District, June 3, 1953). JS000292; "Statement Regarding the Current Water Situation" (Las Cruces, New Mexico: Elephant Butte Irrigation District, March 4, 1954). JS000293; W.F. Resch, "Rio Grande Project -- New Mexico-Texas, Water Announcement" (Department of the Interior, Bureau of Reclamation, March 1, 1954). JS000283; and "Board of Directors, Elephant Butte Irrigation District, to All Irrigation Well Owners," March 11, 1955. JS000285.

[98] Narendra Gunaji, "Ground Water Conditions in Elephant Butte Irrigation District" (University Park, New Mexico: Engineering Experiment Station, New Mexico State University, November 1961), 5. JS000286; 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. JS000287.

water." The hydrologist instead urged EBID to "maintain, and use, all of its surface water rights to the fullest extent possible" because repeated use of groundwater would yield a supply of deficient quality for irrigation.[99]

57. A 1963 USGS report of an investigation by E.R. Leggat, M.E. Lowry, and J.W. Hood of the lower Mesilla Valley (which included a portion of the valley lands in Texas) between 1952 and 1958 indicated that "sustainable supplies" could be obtained from wells in the lower valley, but recognized that surface water applied to the land recharged groundwater, and that "the surface-water supply will be reduced if ground-water withdrawals in the valley are increased" beyond the levels of the 1950s.[100] Leggat, Lowry, and Hood warned that if surface supplies diminished and groundwater extraction expanded "drain flow will cease" and groundwater quality would degrade.[101]

58. For its part, the New Mexico State Engineer's Office ("OSE") evidenced heightened awareness of the interrelationship between Rio Grande stream flow and subsurface water beginning in the 1950s. Two years after the official release of Conover's findings, citing a "scientific investigation" of this connection in the Middle Rio Grande, New Mexico State Engineer S.E. Reynolds declared an "underground water basin" above Elephant Butte to provide for state management and control. Reynolds noted that "the waters of said basin are interrelated with the flow of the Rio Grande Stream System, so that such underground waters are a substantial source of the flow of said stream system," and that "the waters of the Rio Grande Stream System are fully appropriated."[102]

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[99] Gunaji, "Ground Water Conditions in Elephant Butte Irrigation District," 15, 27, and 36-37. JS000286.

[100] Leggat, et al., *Ground-Water Resources of the Lower Mesilla Valley*, AA25, AA45, and AA48. JS000287.

[101] Leggat, et al., *Ground-Water Resources of the Lower Mesilla Valley*, AA45. JS000287.

[102] S.E. Reynolds, State Engineer, Order Declaring the Rio Grande Underground Water Basin, November 29, 1956. ff. 245 Public Works Committee, Middle Rio Grande River - Elephant Butte Dam. 1957-58, 85th Cong, Box 6, Serial No. 6401. File 235-245, 246-254, 255-257, John Dempsey Papers, NMSA.

59. In remarks for an April 1968 symposium on "International Water Law Along the Mexican-American Border," given as New Mexico and Texas were joined in challenging Colorado's performance under the Compact in the Supreme Court, the state engineer linked his earlier action to the Compact. Reynolds acknowledged that the Compact "makes no specific reference to ground water." "However," he went on, "the inflow-outflow mechanism for determining delivery obligations makes the control of ground water appropriations in the upstream states essential for the protection of existing surface water rights in those states and the preservation of their ability to meet the compact commitments."[103]

60. In the 1980s, on this basis, Reynolds opposed El Paso's efforts to mine Mesilla Valley groundwater to enhance its municipal water supply. He declared a "Lower Rio Grande Underground Water Basin in Dona Ana County" in October 1980, and denied El Paso's applications.[104] In the ensuing litigation, *City of El Paso v. Reynolds*, the state engineer defended his decision in part on the hydrological connections between surface flow and groundwater and on the Compact. Although the federal district court in New Mexico ultimately ruled against Reynolds and expressed skepticism about the sincerity of his position, the historical record indicates that he and those in his office were aware of the problem groundwater extraction in lower New Mexico posed to the Project and thus the Compact.[105]

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[103] S.E. Reynolds, State Engineer, The Rio Grande Compact (April 29, 1968), 20-21. Folder 2062, Reynolds, The Rio Grande Compact, April 29, 1968, Box 78, Exps. 231-233, Nos. 2016-2085, State Engineer Reports: Basic/Rio Grande, NMSA; and S.E. Reynolds, State Engineer, State of New Mexico, "The Rio Grande Compact," in Clark S. Knowlton, ed., *International Water Law Along the Mexican-American Border*, Contribution No. 11 of The Committee on Desert and Arid Zones Research, Southwestern and Rocky Mountain Division, A.A.A.S. (El Paso: University of Texas, 1968): 58-59.

[104] Memorandum, To: S.E. Reynolds, From: D.E. Gray, Subject: Lower Rio Grande, September 10, 1980; State Engineer of the State of New Mexico, Special Order No. 126, In the Matter of State Engineer Order No. 126 Declaring the Lower Rio Grande Underground Water Basin in Dona Ana County, September 11, 1980, signed S.E. Reynolds, State Engineer, Received and Approved: Richard A. Simms, Special Assistant Attorney General; and State Engineer of the State of New Mexico, Special Order No. 126-A, In the Matter of State Engineer Order No. 126 Declaring the Lower Rio Grande Underground Water Basin in Dona Ana County, October 22, 1980, signed S.E. Reynolds, State Engineer, Received and Approved: Richard A. Simms, Special Assistant Attorney General. Provided by the City of El Paso; and Ira G. Clark, *Water in New Mexico: A History of Its Management and Use* (Albuquerque: University of New Mexico Press, 1987), 675.

[105] United States District Court for the District of New Mexico, *The City of El Paso*, By and Through

61. In 1982, OSE circulated a paper to the International Boundary and Water Commission (the federal agency charged with ensuring delivery of water to Mexico pursuant to the 1906 treaty) that highlighted the issue. Entitled "Rio Grande, Elephant Butte Dam to El Paso, Texas," the paper summarized the result of "[a] study of streamflow depletion in the Rio Grande Valley between Elephant Butte Dam and El Paso, Texas," plotted on four figures. A double mass diagram (Figure 1), charted "the relationship between the flow of the Rio Grande below Elephant Butte Dam and the flow of the Rio Grande at El Paso, Texas, since storage began in Elephant Butte in 1915," across three periods of time. It took special note of the third period which began in 1951, "the start of the period of lowest water supply available from Elephant Butte Reservoir" that coincided with "extensive groundwater development . . . undertaken to offset shortages to Rio Grande Project lands." "This groundwater development," according to the paper, "has changed the flow regime established

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Its Public Service Board, *Ray Pearson, Carlton C. Homan, Jr., Louie Giallanza, Clinton E. Wolf,* and *Thomas D. Westfall*, Plaintiffs, v. *S. E. Reynolds*, individually and as State Engineer of New Mexico, *Jeff Bingaman*, individually and as Attorney General of New Mexico, *Lalo Garza*, individually and as New Mexico District Attorney for Dona Ana County, Defendants, *Elephant Butte Irrigation District, The City of Las Cruces, New Mexico, and Stahmann Farms, Inc.*, Defendant-Intervenors, Civ. No. 80-730 HB, January 17, 1983. 563 F. Supp. 379; 1983 U.S. Dist. LEXIS 19988; 13 ELR 20755. Provided by Somach Simmons & Dunn. The dispute persisted until 1989 when the U.S. Court of Appeals for the District of Columbia Circuit ruled that no live controversy remained. United States District Court for the District of New Mexico, *Ray Pearson, Carlton C. Homan, Jr., Louie Giallanza, Clinton E. Wolf,* and *Thomas D. Westfall*, Plaintiffs, v. *S. E. Reynolds*, individually and as State Engineer of New Mexico, *Paul Bardacke*, individually and as Attorney General of New Mexico, *Lalo Garza*, individually and as New Mexico District Attorney for Dona Ana County, Defendants, *Elephant Butte Irrigation District, The City of Las Cruces, New Mexico, and Stahmann Farms, Inc.*, Defendant-Intervenors, Civ. No. 80-730 HB, August 3, 1984. 597 F. Supp. 694; 1894 U.S. Dist. LEXIS 24568; 15 ELR 20259; United States District Court for the District of New Mexico, *Ray Pearson, Carlton C. Homan, Jr., Louie Giallanza, Clinton E. Wolf,* and *Thomas D. Westfall*, Plaintiffs, v. *S. E. Reynolds*, individually and as State Engineer of New Mexico, *Paul Bardacke*, individually and as Attorney General of New Mexico, *Lalo Garza*, individually and as New Mexico District Attorney for Dona Ana County, Defendants, *Elephant Butte Irrigation District, The City of Las Cruces, New Mexico, and Stahmann Farms, Inc.*, Defendant-Intervenors, Civ. No. 80-730 HB, August 17, 1984. 1984 U.S. Dist .LEXIS 24276; and United States Court of Appeals for the District of Columbia Circuit, *In re Applications of El Paso*, No. 88-5357, September 22, 1989, Argued; October 20, 1989, Decided. 887 F. 2d 1103; 1989 U.S. App. LEXIS 15897; 281 U.S. App. D.C. 112; 15 Fed. R. Serv. 3d (Callaghan) 22. Provided by Somach Simmons & Dunn.

prior to 1951 such that a greater release is required from Elephant Butte Reservoir to achieve the same flow at El Paso."[106]

62. More recently OSE has recognized groundwater pumping in lower New Mexico directly threatens the Compact. An internal memorandum from 2003 warned that extensive groundwater development below Elephant Butte jeopardized the Project water supply and raised the possibility of a dispute with Texas.[107] The following year, New Mexico State Engineer John R. D'Antonio, Jr. declared a "Lower Rio Grande Water Master District" to provide for the administration of groundwater rights and safeguard "prior surface water…rights."[108]

THE BODY OF RELEVANT HISTORICAL DOCUMENTS FOR UNDERSTANDING THE INTENT AND PURPOSES OF THE 1938 COMPACT IS DISCRETE

63. The body of relevant historical documents for understanding the intent and purposes of the 1938 Compact is discrete. The water resources history of the Upper Rio Grande Basin is broad and encompasses an array of subjects of scholarly interest. However, in my expert opinion, the Rio Grande Compact proceedings and correspondence among the commissioners from the 1920s through the 1930s; records concerning the Rio Grande Joint Investigation and the resulting report; meeting notes and correspondence related to the development of the "technical basis" for the Compact; and subsequent retrospective

[106] [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.

[107] Memorandum, Office of the State Engineer, District 4, May 15, 2003, File: LRG-1776, To: John R. D' Antonio Jr., State Engineer, Paul Saavedra, Water Rights Division Chief, John Romero, WRAP Director, Through: Calvin Chavez, District Supervisor, From: Erek H. Fuchs, Lower Rio Grande Basin Supervisor, Re: Emergency Application for Permit for Supplemental Wells, Local impairment analysis and issues for consideration, Applicant: Elephant Butte Irrigation District, 2-3, and 11-12. Provided by Somach Simmons & Dunn.

[108] State of New Mexico, Office of the State Engineer, In the Matter of the Creation of the Lower Rio Grande Water Master District for the Administration of Rights to and the Use of Ground Water from the Lower Rio Grande Groundwater Basin of New Mexico, Dated this 3rd day of December, 2004, signed John R. D'Antonio, Jr., P.E., State Engineer. NM_00018294 - NM_00018297.

assessments of the Compact deliberations by the commissioners and their engineering advisors offer the most crucial evidence for appreciating how and why the Rio Grande Compact of 1938 was drafted as it was.

64. These historical documents – most produced at or near the time of the Compact by those with direct involvement in the Compact negotiations – reveal the geographic, hydrological, political, and historical circumstances that made an apportionment of the waters of the Rio Grande challenging; the information available to the Rio Grande Compact commissioners and their engineering advisors in the mid-to-late 1930s; and the debates over how best to effectuate an "equitable apportionment" that began in the 1920s and continued into the 1930s. These are many of the same documents relied upon by the first Special Master.

65. Other materials I have reviewed, documents and expert reports produced in these proceedings as well as academic monographs and secondary works, provide further details as to the events leading to and the issues informing the Rio Grande Compact of 1938, but do not fundamentally change my primary conclusions about the Compact and which I believe are clearly drawn from an examination of its history. These conclusions are set forth in Paragraphs 5. a-d above.

I declare under penalty of perjury that the foregoing is true and correct. Executed this 2nd day of November 2020 at Davis, California.

Scott A. Miltenberger, Ph.D.

Exhibit 5

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 STATE OF TEXAS'S OPPOSITIONS TO THE STATE OF NEW MEXICO'S MOTIONS FOR PARTIAL SUMMARY JUDGMENT AND BRIEFS IN SUPPORT

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December 22, 2020

I, Scott A. Miltenberger, declare as follows:

1. I am a professional consulting historian, specializing in water and natural resources issues. I am a partner at JRP Historical Consulting, LLC (JRP), located at 2850 Spafford Street, Davis, CA 95618.

2. I have been retained as an expert by Somach Simmons & Dunn to provide expert opinions and testimony on behalf of the State of Texas (Texas) as to the history and historical issues concerning the Rio Grande Compact of 1938 ("Compact" or "Compact of 1938").

3. I produced the Declaration of Scott Miltenberger, Ph.D.in support of the Texas Motion for Partial Summary Judgment filed on November 5, 2020 (Miltenberger Declaration). TX_MSJ_001585. My professional resume was also provided at that time and is found along with the Miltenberger Declaration in the Texas Appendix of Evidence in Support of Texas's Motion for Summary Judgment. TX_MSJ_001585.

4. I have also examined documents produced in this litigation by Texas, the State of Colorado (Colorado), the State of New Mexico (New Mexico), and the United States. I have reviewed expert reports submitted in this action by New Mexico and the United States. I further reviewed the *First Interim Report of the Special Master* and the historical documents appended to that Report.

5. I additionally examined and evaluated New Mexico's Motion for Partial Summary Judgment on Compact Apportionment, Motion for Partial Summary Judgment to Exclude Claims for Damages in Years that Texas Failed to Provide Notice to New Mexico of its Alleged Shortages, and supporting information filed therewith. The following are my opinions and responses to certain purported undisputed material facts and undisputed facts presented in the two motions.

6. To the extent documents I have relied on in reaching my opinions in this declaration have not been previously produced, true and correct copies of those documents are appended to this declaration as Attachment 1 and produced as part of the Texas Appendix of documents filed contemporaneously. These documents may also be viewed in the electronic version of this declaration by selecting the relevant bookmark. Documents I have relied on that were previously produced in the litigation but not included in the Miltenberger Declaration are appended to this declaration as Attachment 2.

7. I have also authenticated several relevant documents. True and correct copies of those documents are appended as TX_MSJ_006492 - TX_MSJ_006829 and produced as part of the Texas Appendix of documents filed contemporaneously.

A. UNDISPUTED MATERIAL FACT #1, FROM NEW MEXICO'S MOTION FOR PARTIAL SUMMARY JUDGMENT ON COMPACT APPORTIONMENT

8. This paragraph is misleading in that the source documents provide additional factual context that New Mexico excluded. The United States Reclamation Service (Reclamation) did recommend construction of a storage reservoir near Elephant Butte over another site at El Paso, Texas, and that the reservoir was to capture and store flood waters. However, review of the provided primary-source documents – F.H. Newell's *Second Annual Report of the Reclamation Service* (1904), NM-EX 300, and B.M. Hall's *A Discussion of Past and Present Plans for Irrigation of the Rio Grande Valley* (Nov. 1904), NM-EX 301 – indicates that these were not the only waters contemplated to be captured and stored for later use. Newell's report observed that the "proposed [Elephant Butte] reservoir" was "the only . . . with a capacity large enough to utilize the entire flow of the drainage basin. It is situated sufficiently low in the basin to intercept, practically, all of the waters . . . ." – an

inclusive statement of the waters to be stored.[1] Similarly, Hall's report – which considered dams at both the Elephant Butte and El Paso sites before endorsing the former over the latter – noted that with regard to "these projects, or any other plan of water storage on the Rio Grande, it is well to keep in mind the following facts," of which the second was: "All of the water that comes down the river is needed for irrigation. We cannot afford to waste any of it."[2]

B. UNDISPUTED MATERIAL FACT #5, FROM NEW MEXICO'S MOTION FOR PARTIAL SUMMARY JUDGMENT ON COMPACT APPORTIONMENT

9. This paragraph is factually incorrect. Neither cited source (NM-EX 305 and NM-EX 112) indicates that Newell made the quoted remarks in relation to congressional authorization for work on the reservoir. Congress authorized the Rio Grande Project, with Elephant Butte Dam as its centerpiece, the previous year, in 1905.[3] Additionally, the provided quote is incomplete and misleading. According to both cited sources, Newell identified the "balance" of the acreage distribution as "the balance below El Paso on the Texan side of the river."

C. UNDISPUTED MATERIAL FACT #7, FROM NEW MEXICO'S MOTION FOR PARTIAL SUMMARY JUDGMENT ON COMPACT APPORTIONMENT

10. This paragraph is factually incorrect. The 1907 Appropriations Act authorized, for the Department of State, $1 million "Toward the construction of a dam for storing and delivering sixty thousand acre-feet of water annually . . . as provided by a convention between

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[1] NM-EX 300, F.H. Newell, *Second Annual Report of the Reclamation Service*, H.R. Doc. No. 58-44, 379 (1904).

[2] NM-EX 301, B.M. Hall, *A Discussion of Past and Present Plans for Irrigation of the Rio Grande Valley*, 8 (Nov. 1904).

[3] TX_MSJ_002189 – 002192, *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*, February 26, 1905, chap. 798, Pub. L. No. 58-104, 33 Stat. 814.

the United States and Mexico . . . ."; it did not authorize construction of the dam itself.[4] As noted in paragraph 9 above, Congress authorized construction of Elephant Butte Dam along with the Rio Grande Project in 1905.

D. UNDISPUTED MATERIAL FACT #8, FROM NEW MEXICO'S MOTION FOR PARTIAL SUMMARY JUDGMENT ON COMPACT APPORTIONMENT

11. This paragraph is factually incomplete and mischaracterizes the cited primary-source document, Fund for Reclamation of Arid Lands, H.R. Doc 61-1262 (1911). NM-EX 310. References to 750,000 acre-feet and 800,000 acre-feet in the document are projections and estimates of "annual supply" from the reservoir – not as expected release figures. These estimates were based not only on reservoir capacity, but also flow, evaporation, and (as acknowledged by the paragraph), a three acre-feet per acre water duty and losses. Forty percent and not "20 per cent" was the total allowance to be made for those losses: 1) "loss in the distribution system" ("20 per cent"), and 2) "losses in transit" ("20 per cent").[5]

E. UNDISPUTED MATERIAL FACT #9, FROM NEW MEXICO'S MOTION FOR PARTIAL SUMMARY JUDGMENT ON COMPACT APPORTIONMENT

12. This paragraph is misleading. Reclamation made these filings – Letter from B.M. Hall, Supervising Engineer, United States Reclamation Service, to David L. White, Territorial Irrigation Engineer, Territory of New Mexico (Jan. 23, 1906) (NM-EX 306), and NM-EX 309, a Letter from Louis C. Hill, Supervising Engineer, United States Reclamation Service, to Vernon L. Sullivan, Territorial Irrigation Engineer, Territory of New Mexico (Apr. 1908). However, neither filing cited Section 8 of the 1902 National Reclamation Act.

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[4] TX_MSJ_007470 – 007546, *An Act Making Appropriations for Sundry Civil Expenses of the Government for the Fiscal Year Ending June Thirtieth, Nineteen Hundred and Eight, and for Other Purposes*, March 4, 1907, chap. 2918, Pub. L. No. 59-253, 34 Stat. 1295, 1357.

[5] NM-EX 310, Fund for Reclamation of Arid Lands, H.R. Doc 61-1262, 105-106 (1911).

Both filings instead referenced the United States "authority" under the 1902 Reclamation Act to pursue construction of "certain irrigation works in connection with the so-called Rio Grande Project," and observed that "operation of the works in question contemplates the diversion of water from the Rio Grande River." Both filings also cited New Mexico territorial law – Sec. 22, Chap. 102 of the 1905 laws, in the case of the 1906 filing, NM-EX 306; and Sec. 40, Chap. 49 of the 1907 laws, in the case of the 1908 filing, NM-EX 309.[6]

F. UNDISPUTED MATERIAL FACT #15, FROM NEW MEXICO'S MOTION FOR PARTIAL SUMMARY JUDGMENT ON COMPACT APPORTIONMENT

13. This paragraph is factually incorrect. The assumption expressed was not Texas's. In his February 20, 1925 letter to Governor A.T. Hannett in February 1925, New Mexico Compact Commissioner J.O. Seth noted that "Chapter 112 of the Session Laws of 1923 makes no provision whatever for according Texas the right of representation on the Commission."[7] This law was New Mexico's own, authorizing compact negotiations with Colorado.[8] The New Mexico Commissioner wrote:

> The omission of the State of Texas from Chapter 112 of the Session laws of 1923 can be accounted for only on the theory that the Legislature assumed that the only lands in Texas that would be affected by any Compact or Agreement are those lying above Fort Quitman and within the Rio Grande Project of the United States Reclamation Service and that all rights to the waters of the Rio Grande held by these lands would be protected by the Reclamation Service.[9]

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[6] NM-EX 306, Letter from B.M. Hall, Supervising Engineer, United States Reclamation Service, to David L. White, Territorial Irrigation Engineer, Territory of New Mexico (Jan. 23, 1906), and NM-EX 309, Letter from Louis C. Hill, Supervising Engineer, United States Reclamation Service, to Vernon L. Sullivan, Territorial Irrigation Engineer, Territory of New Mexico (Apr. 1908).

[7] NM-EX 315, Letter from J.O. Seth, Commissioner, State of New Mexico, to A.T. Hannett, Governor, State of New Mexico, 2 (Feb. 20, 1925).

[8] TX_MSJ_003356 – 003393, First Meeting, Rio Grande River Compact Commission, Broadmoor Hotel, Colorado Springs, Colo., Sunday, October 26, 1924, 10. Folder 1. First Meeting Rio Grande Compact Commission. Oct. 26, 1924, Box 02-D.002, MS 0235 Elephant Butte Irrigation District Records, 1883-1981, Rio Grande Historical Collections, New Mexico State University Archives and Special Collections, Las Cruces.

[9] NM-EX 315, Letter from J.O. Seth, Commissioner, State of New Mexico, to A.T. Hannett, Governor, State of New Mexico, 3 (Feb. 20, 1925).

The full quotation, read in context, indicates that Commissioner Seth presumed the New Mexico State Legislature believed that Reclamation would safeguard Texas's Project water supply.

G. UNDISPUTED MATERIAL FACT #17, FROM NEW MEXICO'S MOTION FOR PARTIAL SUMMARY JUDGMENT ON COMPACT APPORTIONMENT

14. This paragraph excludes context essential to understanding how the resulting "comprehensive study" – the Rio Grande Joint Investigation (as referenced in paragraph 18 of New Mexico's Motion for Partial Summary Judgment on Compact Apportionment) – was framed. The proposal by the National Resources Committee (NRC) resulted from an NRC Board of Review's assessment that the "water resources of the Rio Grande were fully appropriated," and that New Mexico's Middle Rio Grande Conservancy District's project and other proposed projects in New Mexico and Colorado above Elephant Butte threatened the Rio Grande Project. Miltenberger Declaration paragraphs 12-16, addresses this context. TX_MSJ_001585.

H. UNDISPUTED MATERIAL FACT #19, FROM STATE OF NEW MEXICO'S MOTION FOR PARTIAL SUMMARY JUDGMENT ON COMPACT APPORTIONMENT

15. This paragraph is misleading. Diversions were a category of information in the Joint Investigation Report (or "*JIR*," NM-EX 318), but those diversions were not limited to the waters that might be considered as derived solely from reservoir releases. The *JIR* noted that "return flow" from drains constituted 50 percent of the diversions within the Rio Grande Project, which New Mexico's citation omits.[10] Miltenberger Declaration paragraph 35 likewise notes the importance the *JIR* placed on return flows. TX_MSJ_001585.

[10] NM-EX 318, Harlow M. Stafford et al., Rio Grande Joint Investigation Part I: General Report of the Rio Grande Joint Investigation, 13 (1937).

I. UNDISPUTED MATERIAL FACT #20, FROM STATE OF NEW MEXICO'S MOTION FOR PARTIAL SUMMARY JUDGMENT ON COMPACT APPORTIONMENT

16. This paragraph is misleading. According to the cited pages of the primary-source document – the September 27 to October 1, 1937 Rio Grande Compact Commission proceedings, NM-EX 319 – New Mexico expressed it "was willing to negotiate" for a compact on the basis of several "minimum requirements" (the fourth of which is the quoted statement), and not that the final compact had to possess all these elements for the state to consummate a Compact with Colorado and Texas, as this paragraph implies.[11] The historical record further indicates that the Compact ultimately privileged uses over rights in the Upper Rio Grande Basin, and that New Mexico bargained for water uses above San Marcial and below the Colorado-New Mexico state line, while Texas bargained for water use below San Marcial. Miltenberger Declaration paragraphs 20-26 discuss the privileging of uses over rights, TX_MSJ_001585; and Miltenberger Declaration paragraphs 8, 24, 26, and 37 specifically address what New Mexico and Texas bargained for, as does paragraph 49 below, TX_MSJ_001585.

J. UNDISPUTED MATERIAL FACT #21, FROM NEW MEXICO'S MOTION FOR PARTIAL SUMMARY JUDGMENT ON COMPACT APPORTIONMENT

17. The facts presented in this paragraph are incomplete and assert an incomplete understanding of the Committee of Engineers' December 27, 1937 Report. NM-EX 322. As stated on the first page of the report (after the title page), the "general policy" was expressed by the Compact Commissioners themselves, and the engineers "avoided discussion of the

[11] NM-EX 319, Rio Grande Compact Commission, Proceedings of the Meeting of the Rio Grande Compact Commission Held in Santa Fe, New Mexico, September 27, to October 1, 1937, 12-13 (1937).

relative rights of the water users in the three states."[12] Miltenberger Declaration paragraphs 20-26 discuss the privileging of uses over rights in the development of the Compact and the Committee of Engineers' December 27, 1937 Report. TX_MSJ_001585.

K. UNDISPUTED MATERIAL FACT #23, FROM NEW MEXICO'S MOTION FOR PARTIAL SUMMARY JUDGMENT ON COMPACT APPORTIONMENT

18. The facts presented in this paragraph are incomplete and assert an incomplete understanding of the reasons for the revision. The Committee of Engineers (or Engineering Advisors) revised the normal release figure downward from 800,000 acre-feet to 790,000 acre-feet only after protests made by the Middle Rio Grande Conservancy District's consulting engineer H.C. Neuffer. New Mexico State Engineer and Compact Commissioner Thomas McClure supported Neuffer, even though McClure's engineering advisor John Bliss had accepted the 800,000 acre-feet figure for which Texas had advocated and which the Committee of Engineers had recommended in December 1937. Miltenberger Declaration paragraphs 35-38 discuss this change. TX_MSJ__001585.

L. UNDISPUTED MATERIAL FACT #27, FROM NEW MEXICO'S MOTION FOR PARTIAL SUMMARY JUDGMENT ON COMPACT APPORTIONMENT

19. The *Expert Report of Estevan R. Lopez, P.E.*, at the page cited in this paragraph, page 15, provides no evidence that the figure given for "Project Storage within the Compact" was considered the "maximum capacity of Elephant Butte Reservoir."[13] NM-EX 107.

[12] NM-EX 322, Letter from E.B. Debler, et al., Committee of Engineer Advisors, Rio Grande Compact Commission, to Rio Grande Compact Commission, 40 (Dec. 27, 1937).
[13] NM-EX 107, Estevan R. Lopez, *Expert Report of Estevan R. Lopez, P.E.*, 15 (Oct. 31, 2019).

M. UNDISPUTED MATERIAL FACT #33, FROM NEW MEXICO'S MOTION FOR PARTIAL SUMMARY JUDGMENT ON COMPACT APPORTIONMENT

20. Although the content of Article IV of the Compact and the relationship between the Otowi and San Marcial gages is correctly stated in this paragraph, the paragraph's presented facts are incomplete. NM-EX 330. The paragraph does not recognize the temporal basis for the delivery schedule, which is important context for understanding what those flows truly are and how the Compact works. Miltenberger Declaration paragraphs 22-24 discuss the temporal basis for the delivery schedule. TX_MSJ_001585.

N. UNDISPUTED MATERIAL FACT #36, FROM NEW MEXICO'S MOTION FOR PARTIAL SUMMARY JUDGMENT ON COMPACT APPORTIONMENT

21. The content of Article VII of the Compact as presented in this paragraph is correct. NM-EX 330. However, neither the Compact nor the Lopez expert report state at their respective cited pages that the "relinquished Credit Water becomes Useable Water and is available for use on lands in both New Mexico and Texas."[14] NM-EX 107.

O. UNDISPUTED MATERIAL FACT #37, FROM NEW MEXICO'S MOTION FOR PARTIAL SUMMARY JUDGMENT ON COMPACT APPORTIONMENT

22. Although the content of Article VIII as presented is correct, this paragraph does not acknowledge the second-order purpose of Article VIII: to protect the Project, and thus the water supply to Texas. Miltenberger Declaration paragraph 24 and paragraph 40 address this. TX_MSJ_001585.

[14] NM-EX 330, Rio Grande Compact of 1938, 53 Stat. 785, 788 (1939); and NM-EX 107, Estevan R. Lopez, *Expert Report of Estevan R. Lopez, P.E.*, 23 (Oct. 31, 2019).

P. UNDISPUTED MATERIAL FACT #39, FROM NEW MEXICO'S MOTION FOR PARTIAL SUMMARY JUDGMENT ON COMPACT APPORTIONMENT

23. This paragraph mischaracterizes the historical record. The historical record makes clear that existing uses, circa 1938, not rights were to be protected by the Compact. Miltenberger Declaration paragraphs 20-27 address the privileging of uses over rights in the Compact. TX_MSJ_001585.

Q. UNDISPUTED MATERIAL FACT #42, FROM NEW MEXICO'S MOTION FOR PARTIAL SUMMARY JUDGMENT ON COMPACT APPORTIONMENT

24. This paragraph is misleading. In the cited Letter from Frank B. Clayton, Rio Grande Compact Commissioner, State of Texas, to Sawnie B. Smith (Oct. 4, 1938), Clayton was referencing contract rights – not appropriative rights.[15] NM-EX 328. Miltenberger Declaration paragraphs 30 and 42-45 discuss the contracts for water delivery for the two Rio Grande Project districts – Elephant Butte Irrigation District (EBID) in New Mexico, and El Paso County Water Improvement District No. 1 (EP #1) in Texas. TX_MSJ_001585. The meaning and intent of the Clayton-Smith letter is addressed more fully in paragraphs 28-37 below.

R. UNDISPUTED MATERIAL FACT #43, FROM NEW MEXICO'S MOTION FOR PARTIAL SUMMARY JUDGMENT ON COMPACT APPORTIONMENT

25. This paragraph is misleading. The 790,000 acre-feet release was to serve Project lands in New Mexico and Texas, the 1906 Mexican treaty obligation, and non-Project lands in Texas down to Ft. Quitman, ca. 1938. Miltenberger Declaration paragraphs 29-38 discuss this, and it is addressed in paragraphs 49-51 below. TX_MSJ_001585.

[15] NM-EX 328, Letter from Frank B. Clayton, Rio Grande Compact Commissioner, State of Texas, to Sawnie B. Smith, 1-2 (Oct. 4, 1938).

S. UNDISPUTED MATERIAL FACT #44, FROM NEW MEXICO'S MOTION FOR PARTIAL SUMMARY JUDGMENT ON COMPACT APPORTIONMENT

26. This paragraph is misleading because the Compact does not rely upon the Project to effectuate any apportionment between New Mexico and Texas below Elephant Butte, as the paragraph implies. Instead, it depends on the Project to see that Project beneficiaries in New Mexico receive water – in other words, protecting the Project as an existing use. Miltenberger Declaration paragraphs 26-46 discuss this, and it is addressed in paragraphs 49-51 below. TX_MSJ_1585.

T. UNDISPUTED MATERIAL FACT #45, FROM NEW MEXICO'S MOTION FOR PARTIAL SUMMARY JUDGMENT ON COMPACT APPORTIONMENT

27. This paragraph mischaracterizes the historical record and my deposition testimony. The historical record indicates that Project deliveries were generally based on irrigable acreage in the two states in a ratio of 57 percent for Project lands in New Mexico and 43 percent for Project lands in Texas. However, this paragraph does not offer any supporting evidence that deliveries were made in this fashion in every year and that deliveries were always made in accordance with the 57-43 percent ratio. I did not testify that either was the case. I merely replied in the affirmative when asked if I agreed with that portion of Texas's Complaint that noted this general, historical distribution of Project water deliveries.[16] At least one primary-source document produced by New Mexico in support of its motions in fact suggests that allotments of Project water were not always equal (see paragraph 53 below). NM-EX 323. Moreover, there is no language in the Compact requiring deliveries of Project water in this manner, and I did not testify that the Compact directed Project deliveries in any way, which the phrase "under the Compact" in this paragraph implies.[17] NM-EX 330.

[16] NM-EX 220, Miltenberger Dep. (June 8, 2020), 39:2-40:6.
[17] *Id* at 47:17-48:18.

U. UNDISPUTED MATERIAL FACT #46, FROM NEW MEXICO'S MOTION FOR PARTIAL SUMMARY JUDGMENT ON COMPACT APPORTIONMENT

28. This paragraph mischaracterizes Frank B. Clayton's October 4, 1938 letter to Sawnie Smith. NM-EX 328. Although the paragraph accurately quotes Clayton, it pays insufficient attention to the details of the letter and fails to acknowledge the context in which the letter was drafted – both of which are essential to understanding the ideas Clayton was expressing to Smith. Miltenberger Declaration paragraphs 31 and 42 discuss the Clayton-Smith letter and additional discussion is provided here to clarify further the letter's meaning. TX_MSJ_001585.

29. Following the negotiation of the Compact, interests in Texas below Ft. Quitman questioned the absence of a state line delivery for Texas (as noted in Miltenberger Declaration paragraph 41, TX_MSJ__001585) as well as the lack of a specific quantity of water for Texas in the Compact (as Smith did, as noted below). Clayton sought to assure water users in Texas's lower Rio Grande and others that Texas's delivery was at Elephant Butte, that the waters above Ft. Quitman were fully dedicated, and that the Compact secured the waters to which the downstream state was entitled above Ft. Quitman.

30. Clayton's letter to Smith was written within this context. Smith, an attorney from the McAllen area of Texas, below Ft. Quitman, was specifically concerned, as he articulated in a September 29, 1938 letter to the Texas commissioner that "the Rio Grande Compact makes no provision for the division of waters below Elephant Butte between the States of New Mexico and Texas, and makes no provision concerning the amount of water to which Texas is entitled." Smith's "understanding" was that "the total amount of water in the project storage provided for in the compact is used or needed by the Rio Grande project except the portion thereof required to be delivered to Mexico" and that there was a "60%-40%" division of the Project "area" between New Mexico and Texas. By Smith's reasoning,

"if . . . the present usage and physical conditions remain the same, the division of the waters as between Texas and New Mexico would be in the proportions of the Rio Grande project area in said two States." However, Smith saw nothing to this effect in the Compact itself, and "nothing that would prevent controversy between the two States in the future regarding the division of the water between the two States." "This omission is too obvious to have been inadvertent," so Smith asked for an explanation.[18]

31. In answering Smith, Clayton drew an important distinction between the "question of where the point of division of the waters of the Rio Grande as between Texas and New Mexico should be fixed," and the "the question of the division of the water released from Elephant Butte reservoir." Regarding this first question, Clayton emphasized to Smith that federal control of Elephant Butte and the historical development of the Rio Grande Project rendered a state line delivery to Texas impossible; he also cited the "irregular contour" of the state line as presenting difficulties in assessing "the water passing the Texas state line." As far back as the temporary compact, the states had therefore agreed that "New Mexico obligations as expressed in the compact must be with reference to deliveries at Elephant Butte." Elephant Butte, in short, was the delivery point for Texas's apportionment.[19]

32. As to the separate "question of the division of the water released from Elephant Butte reservoir," Clayton pointed to federal contracts for Project water as well as the 1906 Mexican treaty. Those contracts included not only the so-called "Downstream Contracts" – the 1937 contracts between the United States and EBID and the United States and EP #1, and the 1938 contract between EBID and EP #1 concerning Project repayments and water delivery

[18] TX_MSJ_007565 – 007566, Sawnie B. Smith to Frank B. Clayton, Rio Grande Compact Commissioner for Texas, September 29, 1938. Box 2F466, Rio Grande Compact Commission – Frank B. Clayton Papers, Dolph C. Briscoe Center for American History, University of Texas at Austin.
[19] NM-EX 328, Frank B. Clayton, Rio Grande Compact Commissioner, State of Texas, to Sawnie B. Smith, 1 (Oct. 4, 1938).

– but also a Warren Act contract with Hudspeth County Conservation and Reclamation District No. 1 (Hudspeth), below the Project and above Ft. Quitman, for water wasted beyond the Project (referenced in Miltenberger Declaration paragraphs 34 and 42 TX_MSJ_001585. The districts' 1937 contracts, Clayton explained, provided for water on an equal basis between the two Project districts based "on the areas involved in the two States," and the 1938 contract identified more precisely "the acreage now actually in cultivation" between the two districts: 88,000 in EBID and 67,000 in EP #1.[20]

33. The contracts assured Clayton that Texas would receive its due from Elephant Butte. The EBID and EP #1 contracts delineated the basis upon each would receive water from the Project, which was under federal control. The Texas commissioner thus expressed confidence to Smith that there would be no "difficulty about the allocation of this water" in the future – a statement clearly intended to assuage Smith's concern about a possible "controversy."[21]

34. Releases from Elephant Butte, however, served more than Project lands as Clayton pointed out to Smith. In addition to the 1906 Mexican treaty obligation, the Texas commissioner noted that non-Project lands above Ft. Quitman received water. As noted in Miltenberger Declaration paragraph 34, lands in Texas downstream to Ft. Quitman were the beneficiaries of return flows from drainage works upstream. Clayton acknowledged this phenomenon, observing to Smith that Hudspeth obtained "'tail-end' or waste water" from the Project, water the non-Project district could divert under its Warren Act contract. "[L]ands privately owned below [Hudspeth]" also acquired water "by taking by gravity or pumps what happens to be in the river channel," the Texas commissioner told Smith – a further indication

[20] *Id.* at 2.
[21] *Id.*

of return flows from upstream and water service beyond the limits of the Project. Importantly, in calling attention to the attenuated nature of this water below the Project and above Ft. Quitman, Clayton underscored the fact that little water would pass Ft. Quitman and be available to downstream water users outside the Compact.[22]

35. None of the contracts referenced or discussed by Clayton are recognized in the language of the Compact and none bear on Compact administration. The 1938 contract, in fact, was purposefully excluded. The Texas commissioner informed Smith that because this contract was "a private one between the districts involved . . . it was felt neither necessary nor desirable that it be incorporated in the terms of the Compact."[23] This statement implies that the Compact negotiators intended for the Compact to stand alone.

36. Furthermore, I am unaware of any historical documents that would support a claim that the commissioners intended the contracts to supplement the Compact, as New Mexico's Motion for Partial Summary Judgment on Compact Apportionment suggests. Most notably, summaries and assessments of the Compact by New Mexico State Engineer and Rio Grande Compact Commissioner Thomas McClure and his engineering advisor John Bliss following the Compact do not mention these contracts as a component or an element of Compact administration. Neither, moreover, recognized that New Mexico obtained an apportionment below Elephant Butte by these contracts.[24]

37. In my expert opinion, Clayton's letter to Smith is not an explanation of how the Compact was to function as asserted in New Mexico's Motion for Partial Summary Judgment on Compact Apportionment. Rather, to address Smith's specific concerns, Clayton

[22] *Id.*
[23] *Id.*
[24] NM-EX 327, J.H. Bliss, Provisions of the Rio Grande Compact, (Apr. 2, 1938); and Thomas B. McClure, State Engineer, "Analysis of the Compact," undated. NM_00164500.

offered a description of the prevailing physical circumstances that structured the Compact and the "present uses" which the Compact was intended to respect and preserve. As I discussed above, and in Miltenberger Declaration paragraphs 29-46, development of the Rio Grande Project meant that New Mexico's deliveries to San Marcial pursuant to the Compact were the state-line delivery to Texas. TX_MSJ_001585. A primary intent of the Compact, moreover, was to protect "present uses" of water in the Upper Rio Grande Basin, circa 1938; the Rio Grande Project was an existing "use" to be safeguarded. Throughout the Compact negotiations, Texas advocated for the Project for only through the Project could it obtain Rio Grande water. The downstream state accepted that releases from Elephant Butte under federal control served Project lands in New Mexico by contract in accordance with Project operations – just as those releases also satisfied the 1906 Mexican treaty obligation. The water delivered by New Mexico pursuant to the Compact, as Clayton's letter to Smith makes clear, was nonetheless ultimately water for Texas.

V. UNDISPUTED MATERIAL FACT #47, FROM NEW MEXICO'S MOTION FOR PARTIAL SUMMARY JUDGMENT ON COMPACT APPORTIONMENT

38. The paragraph mischaracterizes the document, Letter from Frank B. Clayton, Rio Grande Compact Commissioner, State of Texas to C.S. Clark, Chairman, Board of Water Engineers, State of Texas (October 16, 1938). NM-EX 329. As with the Clayton-Smith letter, the quotation offered from the Clayton-Clark letter is correct. NM-EX 328. However, attention to the details of the letter and the essential context for the letter reveals a different purpose and meaning for the communication and the provided quotation.

39. Clayton wrote to Clark, the chairman of the Texas Board of Water Engineers ("Board"), immediately following meetings the Texas commissioner had with water users below Ft. Quitman, meetings in which "misunderstandings" about the Compact were voiced

that he was compelled to correct. Clayton traced the source of these misunderstandings, which "reflect[ed]" on him "both personally and officially, and on the officials of the irrigation districts above Fort Quitman," to Clark and the Board.[25] Clayton's detailed ten-page letter responded to claims that he had failed to keep the Board informed as to the Compact negotiations and addressed several of the misunderstandings about the Compact that the Texas commissioner had confronted.

40. One "statement" in particular, "attributed" to Clark, prompted a reply by Clayton that is important to consider when assessing the meaning of the quotation offered in New Mexico's motion. This statement was "to the effect that in negotiating the permanent compact [Clayton] disregarded the rights and interests of the lower Rio Grande Valley." The Texas commissioner reminded the chair that "the commissioners found it utterly impossible to agree on the relative priorities of the rights of the three States." Instead, they drafted a Compact which had "the whole effect . . . to 'freeze' the supply of water to Elephant Butte reservoir at its present status; that is, to guarantee to Texas that no further encroachments will be made up-stream, in New Mexico or Colorado." According to Clayton, "it was the sense of all concerned, including [Clark] . . . that this was the very best Texas could hope to get."[26] Such a statement is consistent with my expert opinions expressed in Miltenberger Declaration paragraphs 20-26, that the Compact privileged existing uses of water over rights and sought to protect the hydrological status quo in the basin. TX_MSJ_001585.

41. Clayton went on observe that "no allocation of waters as between different sections of the same State was possible in an interstate compact, and none was attempted."[27]

[25] NM-EX 329, Letter from Frank B. Clayton, Rio Grande Compact Commissioner, State of Texas to C.S. Clark, Chairman, Board of Water Engineers, State of Texas, 1 (October 16, 1938).
[26] *Id.* at 7.
[27] *Id.*

Made in reference to lands in Texas above and below Ft. Quitman, the statement was in keeping with the understood purpose of the Compact, as reflected in the history of its negotiation: to effectuate an equitable apportionment among the states involved – not within the states.

42. Turning his attention then to "some misunderstanding regarding the fact that it is the supply to the reservoir that is provided for in the Compact, and not what passes the New Mexico-Texas state line," Clayton explained the reasons for the absence of a state-line delivery for Texas in a nearly identical way as he had in his letter to Smith. The Texas commissioner cited "the irregular contour of the boundary between the two States and other physical facts" that made "it . . . practically impossible to measure the water passing the state line at the various places in the river channel and in the canal, lateral and drains."[28]

43. Clayton also pointed to federal control of Elephant Butte Reservoir as a reason – and here is where the quotation offered by New Mexico begins. The Texas commissioner noted to Clark that "since the source of supply for all the lands above Fort Quitman and below Elephant Butte reservoir, whether in Texas or New Mexico, is the reservoir itself," neither Colorado nor New Mexico "could hardly be expected . . . [to] guarantee a certain amount of water to pass the Texas line . . . ." That amount was "wholly dependent upon the releases from the reservoir, and the reservoir is under the control of an entirely independent agency: the Bureau of Reclamation."

44. Clayton then raised the 1938 "contract between the New Mexico interests and the Texas interest in the Rio Grande Project." As he did in his letter to Smith, the Texas commissioner observed that "all the lands in the Project have equal water rights, and the acreage to be irrigated is practically 'frozen' at its present figure, with a three percent.

[28] *Id.*

'cushion.'" "It is therefore not necessary," he expressed Clark, "even if it were practicable, to make definite provision in the Compact for the amount of water to pass the Texas-New Mexico state line."[29]

45. In my expert opinion, the provided quotation is not a description of Compact operation and fails to consider the context of Clayton's efforts to dispel opposition in Texas, the earlier Smith letter, and relevant details of Clark's letter. The quotation is instead an explanation as to the absence of a state line delivery and an attempt to allay concerns that the lack of such a delivery provision in the Compact would preclude Texas from obtaining its equitable apportionment under the Compact. Clayton viewed federal control of Elephant Butte Reservoir and the contracts that directed water delivery to Project lands in New Mexico and Texas as providing assurance to Texas, independent of the Compact but consistent with the Compact's aim of safeguarding existing uses.

W. UNDISPUTED MATERIAL FACT #48, FROM NEW MEXICO'S MOTION FOR PARTIAL SUMMARY JUDGMENT ON COMPACT APPORTIONMENT

46. This paragraph does not provide sufficient context to understand fully the meaning of the quotation provided from Raymond Hill's *Development of the Rio Grande Compact of 1938*. NM-EX 401. The paragraph correctly quotes from Hill's narrative, but in the absence of context – much of which is also discussed in Miltenberger Declaration paragraphs 29-46 – the quotation is misleading. TX_MSJ_001585.

47. Hill, Texas's engineering advisor during the Compact negotiations and for several years after, drafted *Development of the Rio Grande Compact of 1938* for a Supreme Court original action involving the three Rio Grande states in the 1960s. Hill's narrative relies upon his memory and the available engineers' reports and commission proceedings to

[29] *Id.* at 8.

provide an account of the specific events, issues, and considerations that led to the Compact and an explanation of the Compact provisions.

48. According to Hill, he and his fellow advisors were directed to preserve the hydrological "status quo" of the Upper Rio Grande Basin in formulating the basis for the Compact:

> The Committee of Engineering Advisers was instructed to prepare schedules of deliveries by Colorado and by New Mexico that would insure [*sic*] maintenance of the relationships of stream inflow to stream outflow that had prevailed under the conditions existent when the Compact of 1929 was executed. The Committee of Engineering Advisers was also instructed to provide for freedom of development of all water resources in the drainage basin of Rio Grande above Elephant Butte subject only to compliance with these schedules.[30]

Additionally, in his opinion,

> The Rio Grande Compact should thus be looked upon as an expansion of the Compact of 1929, designed to provide for the maximum beneficial use of water in the basin of Rio Grande above Fort Quitman without impairment of any supplies beneficially used under the conditions prevailing in 1929.[31]

Hill makes plain that fundamentally the Compact was intended to protect existing water uses through preservation of prevailing conditions, as noted in paragraph 37 in particular above and in Miltenberger Declaration paragraphs 20-28. TX_MSJ_001585.

49. As these statements show, the quotation provided by New Mexico is taken out of context because it disregards how Hill understood the structure and purpose of the Compact. Of equal importance in assessing the meaning of the quotation was New Mexico and Texas's respective positions throughout the negotiations of the 1930s. According to Hill, "it was the position of the Commissioner for New Mexico that, for the purposes of the Compact, Elephant Butte Dam should be deemed to be the dividing line between New Mexico

[30] NM-EX 401, Raymond A. Hill, *Development of the Rio Grande Compact of 1938*, 5 and 62 (Oct. 8, 1968).
[31] *Id.* at 63.

and Texas."[32] Additionally, "The Rio Grande Compact Commissioner for Texas, who had been of counsel in the action Texas vs New Mexico in the Supreme Court of the United States, likewise considered that it was impracticable to separate the requirements of Texas from those of the lands in New Mexico supplied by water from Elephant Butte Reservoir." The commissioner, Frank Clayton, thus requested 800,000 acre-feet per year from Elephant Butte.[33]

50. The quotation provided by New Mexico itself appears at the end of a section in Hill's narrative, entitled "Allotment for Texas" – and that leaves little doubt that the content of the section concerns Texas's apportionment under the Compact, precisely along the lines Hill indicates above and which have been discussed earlier in this declaration and in the previous Miltenberger Declaration. Texas's engineering advisor begins this section by once again observing that Clayton asked first for 800,000 acre-feet as the annual release from Elephant Butte. Hill explains that this figure was revised downward to 790,000 acre-feet annually following the objection of New Mexico's Rio Grande Compact Commissioner, before identifying where in the Compact this figure appears (specifically in Article I, paragraph (q), Article VII, and Article VIII).[34]

51. After this discussion comes the paragraph from which New Mexico quotes. In the absence of the additional detail and context provided above, New Mexico's reliance on the quotation is misleading. Hill clearly understood the 790,000 acre-feet release from Elephant Butte to be for the benefit of Texas – but given the aim of the Compact to protect existing water uses, of which the Rio Grande Compact was one, some of the water apportioned to Texas served Project lands in New Mexico as well as the 1906 Mexican treaty.

[32] *Id.* at 18.
[33] *Id.* at 19.
[34] *Id.* at 34-37.

X. UNDISPUTED MATERIAL FACT #54, FROM NEW MEXICO'S MOTION FOR PARTIAL SUMMARY JUDGMENT ON COMPACT APPORTIONMENT

52. While this paragraph is correct that "[a]t the time the Compact was signed" the Project had been in operation for "over twenty years," the cited sources in this paragraph do not provide support for the claim that the Project had been operated "as a single unit" nor do they explain what is meant by "under Reclamation law." NM-EX 318 and NM-EX 005. NM-EX 005 paragraph 9 states that the Project was operated "as a single unit and pursuant to Reclamation law" but does not cite to documentary evidence.

Y. UNDISPUTED MATERIAL FACT #56, FROM NEW MEXICO'S MOTION FOR PARTIAL SUMMARY JUDGMENT ON COMPACT APPORTIONMENT

53. This paragraph is misleading. The cited primary document, United States Reclamation Service, *Project History Rio Grande Project Year 1937* (1938) suggests that an equal allocation was set in 1937. NM-EX 323. However, it is unclear from that document if this was the practice in all years prior to the Compact. Even for 1937, the allotment basis was abandoned because individual water users had exceeded that amount in July.[35]

Z. UNDISPUTED MATERIAL FACT #57, FROM NEW MEXICO'S MOTION FOR PARTIAL SUMMARY JUDGMENT ON COMPACT APPORTIONMENT

54. This paragraph is factually misleading. Congress authorized the execution of amended repayment contracts with EBID and EPCWID (or EP #1) in 1937,[36] but it did not authorize the 1938 contract as such.[37] The 1938 Downstream Contract was instead part of an

[35] NM-EX 323 at PDF p. 22, NM_00024871 (original document unpaginated).

[36] NM-EX 320, Contract between the United States and the Elephant Butte Irrigation District adjusting construction charges and for other purposes (Nov. 9, 1937) and NM-EX 321, Contract between the United States and the El Paso County Water Improvement District No. 1 adjusting construction charges and for other purposes (Nov. 10, 1937).

[37] NM-EX 324, Contract Between Elephant Butte Irrigation District and El Paso County Water Improvement District No. 1 (Feb. 16, 1938) ("1938 Downstream Contract").

effort by Reclamation, extending back to 1929, to fix the basis for repayments between the two districts. The districts themselves ultimately instigated this particular agreement to settle the issue. Miltenberger Declaration paragraphs 43-45 discuss the 1937 and 1938 Downstream Contracts; the context and purpose of the 1938 Downstream Contract is addressed in more detail below. TX_MSJ_001585.

55. As discussed in Miltenberger Declaration paragraph 44, federal law obligated reclamation project water users to repay the costs incurred by the United States in building, operating, and maintaining a reclamation project. TX_MSJ_001585. The original 1906 joint construction contract between Elephant Butte Water Users Association (predecessor to EBID) and El Paso Valley Water Users Association (predecessor to EP #1), and the United States had specified "ten equal annual payments," "apportioned equally per acre among those acquiring such rights [i.e., the water users]."[38] In 1918 and 1920, following the dissolution of the water users' associations and their reconstitution as quasi-municipal entities with the power to tax individual members, new contracts were drafted that made irrigated acreage the basis for allocating shared projects costs between EBID and EP#1, respectively.[39] Eight years

[38] NM-EX 308, Articles of Agreement between the United States of America, Elephant Butte Water Users Association, and El Paso Valley Water Users' Association, section 4, page 3-4 (June 27, 1906).

[39] TX_MSJ_006343 – TX_MSJ_006484, Department of the Interior, Bureau of Reclamation, Rio Grande Project-New Mexico-Texas, Contract Dated June 15, 1918 – between The United States of America and The Elephant Butte Irrigation For Repayment of Construction and Operation and Maintenance Charges, Article 6, Article 8, and Article 10; Department of the Interior, Bureau of Reclamation, Rio Grande Project-New Mexico-Texas, Contract Dated January 17, 1920 between The United States of America and The El Paso County Water Improvement District No. 1, For Repayment of Construction and Operation and Maintenance Charges, Article 7, Article 8, and Article 9, in Department of the Interior, Bureau of Reclamation, Rio Grande Irrigation Project, New Mexico-Texas, Contracts with Water User's Organizations (Copies), Compiled November 1, 1929. 232-29 RG Separate Folder, 249-H, Contracts with Water Users, Box 716 Old Box 509-510, Code 104.RG 37 through Code 402.RG 28, Engineering and Research Center, Project Reports, 1910-55, Records of the United States Bureau of Reclamation, Record Group 115 [RG 115), National Archives at Denver [NARA Denver]. These documents were previously provided with my Expert Report and with Miltenberger Declaration.

later, in the summer of 1928, Congress authorized the Interior Department to extended the districts' repayment schedule with irrigation acreage remaining as the basis for repayments.[40]

56. Neither the 1918 and 1920 contracts nor the extended repayment schedule, however, identified what each district's irrigated acreage should be for the purposes of repayment. In early February 1929, facing the prospect of constructing additional drainage works for EP #1, Reclamation Chief Engineer R.F. Walter sought to determine this with EBID and EP #1. At a meeting with Walter and acting Rio Grande Project superintendent L.R. Fiock, EP #1 manager Roland Harwell expressed his district's desire for its obligation to be predicated on 67,000 acres. EBID representatives did not attend this meeting, but informed Walter by telegram that their district requested 88,000 acres as its basis.[41] Reclamation officials were agreeable, but before a formal agreement could be made the global financial collapse precipitated by the United States stock market crash of October 1929 cast into doubt the ability of any federal reclamation project's water users to meet their repayment obligations.[42]

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[40] TX_MSJ_007547 – 007548, *An Act Extending the time of construction payments on the Rio Grande Federal irrigation project, New Mexico-Texas*, May 28, 1928, chap. 815, Pub. L. No. 70-556, 45 Stat. 785.

[41] TX_MSJ_007552 – 007556, Memorandum, From: Chief Engineer, To: Commissioner, Subject: Determination of irrigable acreage and total construction liability of the irrigation districts – Rio Grande Project, February 18, 1929; and TXC_MSJ_007452 – 007456, Memorandum Relating to Additional Work for El Paso County Water Improvement District Number One [February 16, 1929], enclosed with Memorandum, February 18, 1929. ff. 301. Rio Grande, Board & Engineering Reports on Construction Features, Oct. 1926 thru July 1929, Transfer Case, Box 913 Rio Grande 241.27—301; Entry 7, RG 115, NARA Denver. Memorandum, From Chief Engineer, To: Commissioner, February 18, 1929 was previously produced with my Expert Report.

[42] TX_MSJ_007552 – 007556, Memorandum, From: Chief Engineer, To: Commissioner, Subject: Determination of irrigable acreage and total construction liability of the irrigation districts – Rio Grande Project, February 18, 1929. ff. 301. Rio Grande, Board & Engineering Reports on Construction Features, Oct. 1926 thru July 1929, Transfer Case, Box 913 Rio Grande 241.27—301; Entry 7, RG 115, NARA Denver; and TX_MSJ_005847 – 005852, Donald J. Pisani, *Water and American Government: The Reclamation Bureau, National Water Policy, and the West, 1902-1935* (Berkeley: University of California Press, 2002), 149. Both documents were previously produced with my Expert Report.

57. As discussed in Miltenberger Declaration paragraph 45, Congress amended reclamation law to provide relief to Project water users and those amendments led to the 1937 "Downstream Contracts" TX_MSJ_001585; NM-EX 320; NM-EX 321. The basis for the allocation of repayments between EBID and EP #1, however, remained unsettled with no formal agreement as to each district's irrigated acreage. In the fall of 1937, the districts themselves prepared an agreement to this effect, which included a three percent "cushion" to permit some fluctuation in the irrigated areas of the two districts.[43] This draft contract became the basis for a negotiation between the districts and Reclamation that lasted into early 1938. Reclamation officials ultimately agreed that the Secretary of the Interior should approve of the contract and that the contract should be made effective for the duration of the amended repayment contracts then being worked out with each district – the 1937 Downstream Contracts.[44] EBID and EP #1 readily accepted these changes, executing the revised contract collectively and submitting it for Interior Department approval within a day of receiving Reclamation comments in early November.[45] Concerns that language regarding

[43] TXC_MSJ_007457 – 7459, Roland Harwell, Manager, to L.R. Fiock, Superintendent, Bureau of Reclamation, October 22nd, 1937. ff. 400. Rio Grande, Lands-General, 1930 thru, Box 932, Rio Grande Pro. 400.__400.08, Project Correspondence File, 1930-1945, RG 115, NARA Denver; and Contract, undated, with comments. Folder 2, El Paso Water Improvement District #1. (500.2), Box 02-B.036, Office Files, 1937-1948, MS 0235 Elephant Butte Irrigation District Records, 1883-1981, Rio Grande Historical Collections, New Mexico State University Archives and Special Collections, Las Cruces.

[44] TXC_MSJ_007460 – 007463, Memorandum, From: Superintendent [L.R. Fiock], To: The Commissioner, Washington, D.C. [John C. Page], Subject: Interdistrict Agreement regarding Irrigable Area – Rio Grande Project, October 23, 1937; TXC_MSJ_007468 – TXC_MSJ_007469_1, Memorandum, From: Commissioner [John C. Page], To: Superintendent, El Paso Texas, Subject: Interdistrict Agreement regarding Irrigable Area – Rio Grande Project., Nov. 2, 1937; TXC_MSJ_007464 – 007467, Memorandum, From: Chief Engineer [R.F. Walter], To: The Commissioner, Washington, DC [John C. Page], Subject: Interdistrict Agreement regarding Irrigable Area – Rio Grande Project, November 2, 1937. ff. 400. Rio Grande, Lands-General, 1930 thru, Box 932, Rio Grande Pro. 400.__400.08, Project Correspondence File, 1930-1945, RG 115, NARA Denver.

[45] TXC_MSJ_007469_2 – 007469_5, L.R. Fiock, Superintendent, to Roland Harwell, Manager, November 9, 1937. ff. 222. Rio Grande, Irrigation District, Sept. 1937 thru Dec. 1937, Box 916, Rio

"the distribution of accounting" in the proposed contract could be interpreted as altering the individual contracts between the US and the districts (the 1937 Downstream Contracts), however, delayed approval.[46] An additional revision was made to clarify this language before the was executed by the districts in mid-February 1938.[47] Assistant Secretary of the Interior, Oscar L. Chapman subsequently provided departmental approval to the agreement in April 1938.[48]

58. As noted in Miltenberger Declaration paragraph 45, the 1938 Downstream Contract between the two districts memorialized the historical distribution of repayment costs for storage and general project features between EBID and EP #1. TX_MSJ_001585. Those costs were based their respective irrigated acreages – acreages to which the districts had

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Grande Pro. 222.; TXC_MSJ_007469_6 – 007469_8, , Roland Harwell, Manager, to L.R. Fiock, Project Superintendent, November 10th, 1937; TXC_MSJ_007469_9 – 007469_11, Memorandum, From: Superintendent [L.R. Fiock], To: The Commissioner, Washington, DC (Through Chief Engineer), Subject: Interdistrict Agreement regarding Irrigable Area – Rio Grande Project, November 12, 1937; and TX_MSJ_007557 – 007559, John C. Page, Commissioner to The Secretary of the Interior, November 29, 1937. ff. 400. Rio Grande, Lands-General, 1930 thru, Box 932, Rio Grande Pro. 400.__400.08, Project Correspondence File, 1930-1945, RG 115, NARA Denver.

[46] TXC_MSJ_007469_12 – 007469_16, Memorandum, From: Acting Commissioner [R. Williams], To: Superintendent, El Paso, Texas, Dec. 1, 1937; TXC_MSJ_007469_16 – 007469_18, L.R. Fiock, Superintendent, to Roland Harwell, Manager, December 9, 1937. ff. 400. Rio Grande, Lands-General, 1930 thru, Box 932, Rio Grande Pro. 400.__400.08, Project Correspondence File, 1930-1945, RG 115, NARA Denver.

[47] TXC_MSJ_007469_19 – 007469_21, Memorandum, From: Superintendent [L.R. Fiock], To: The Commissioner, Washington, D.C., Subject: Interdistrict agreement regarding irrigable area – Rio Grande Project, January 20, 1938; TXC_MSJ_007469_22 – 007469_24, Memorandum, From: Commissioner [John C. Page], To: Superintendent, El Paso, Texas, Subject: Interdistrict agreement regarding irrigable area, Rio Grande Project, January 31, 1938; TXC_MSJ_007469_25 – 007469_27, L.R. Fiock, Superintendent, to N.B. Philips, Manager, Elephant Butte Irrigation District, and Roland Harwell, Manager, El Paso County Water Improvement District No. 1, February 11, 1938; TXC_MSJ_007469_28 – 007469_30, Roland Harwell, Manager, to L.R. Fiock, Project Superintendent, March 5th, 1938; and TXC_MSJ_007469_31 – 007469_33, Memorandum, From: Superintendent [L.R. Fiock], To: The Commissioner (Through Chief Engineer, Denver, Colorado), Subject: Interdistrict Agreement regarding Irrigable Area – Rio Grande Project, March 7, 1938. ff. 400. Rio Grande, Lands-General, 1930 thru, Box 932, Rio Grande Pro. 400.__400.08, Project Correspondence File, 1930-1945, RG 115, NARA Denver.

[48] NM-EX 324, Contract Between Elephant Butte Irrigation District and El Paso County Water Improvement District No. 1 (Feb. 16, 1938).

committed themselves in 1929: 88,000 acres in EBID and 67,000 acres in EP #1 – permitting a three-percent expansion in that acreage in any one year "to be subject to construction charges."[49]

59. In my expert opinion, the 1937 and 1938 Downstream Contacts are less about water deliveries than they are about the repayment obligations of the districts to the federal government for the Project. Where it comes to references to water delivery in these contracts, it is clear those deliveries concern the Project and not the Compact. Moreover, while Clayton presented these contracts to Smith and Clark as providing assurance that Texas would receive Rio Grande water in the absence of a state-line delivery requirement and prescribed quantity of water (as pointed out in paragraphs 31-34 above), none of these contracts were incorporated by reference or in the language of the Compact; in fact, the 1938 Downstream Contract was specifically excluded. Additionally, as the Texas commissioner noted to Smith, Texas also received water from Elephant Butte outside the limits of the Project and these Downstream Contracts. There is no historical evidence, in short, that the 1937 and 1938 Downstream Contracts define the Compact apportionment to Texas.

AA. UNDISPUTED MATERIAL FACT #58, FROM NEW MEXICO'S MOTION FOR PARTIAL SUMMARY JUDGMENT ON COMPACT APPORTIONMENT

60. This paragraph correctly quotes from the cited document but mischaracterizes the context and purpose of the 1938 Downstream Contract as discussed in paragraphs 54-59 above. NM-EX 324.

[49] *Id.*

BB. UNDISPUTED FACT #5, FROM NEW MEXICO'S MOTION FOR PARTIAL SUMMARY JUDGMENT TO EXCLUDE CLAIMS FOR DAMAGES IN YEARS THAT TEXAS FAILED TO PROVIDE NOTICE TO NEW MEXICO OF ITS ALLEGED SHORTAGES

61. This paragraph correctly quotes from the 1938 Downstream Contract but in the absence of an understanding of the context and purpose of the contract (as explained in paragraphs 54-59, above), the paragraph is misleading. NM-EX 324.

CC. UNDISPUTED FACT #7, FROM NEW MEXICO'S MOTION FOR PARTIAL SUMMARY JUDGMENT TO EXCLUDE CLAIMS FOR DAMAGES IN YEARS THAT TEXAS FAILED TO PROVIDE NOTICE TO NEW MEXICO OF ITS ALLEGED SHORTAGES

62. This paragraph is factually incomplete. The 1908 filing was for "all the unappropriated waters of the Rio Grande and its tributaries."[50] NM-EX 309.

DD. AUTHENTICATION OF DOCUMENTS RELIED ON IN TEXAS'S OPPOSITION TO THE NEW MEXICO MOTION FOR PARTIAL SUMMARY JUDGMENT TO EXCLUDE CLAIMS FOR DAMAGES IN YEARS THAT TEXAS FAILED TO PROVIDE NOTICE TO NEW MEXICO OF ITS ALLEGED SHORTAGES

63. Each document described below was produced during the course of discovery in this litigation and is in a condition that creates no suspicion about its authenticity.

64. Attached hereto at TX_MSJ_006492 – TX_MSJ_006519, is a true and correct copy of the U.S. Geological Survey study entitled "Preliminary memorandum on ground-water supplies for Elephant Butte Irrigation District, New Mexico," dated September 1947. This document was produced by New Mexico during discovery. I used it in my expert rebuttal / supplemental report dated December 30, 2019, and in my previous declaration (Miltenberger Declaration paragraph 61. TX_MSJ_001585. I have examined it and the

[50] NM-EX 309, Letter from Louis C. Hill, Supervising Engineer, United States Reclamation Service, to Vernon L. Sullivan, Territorial Irrigation Engineer, Territory of New Mexico (Apr. 1908).

document is in a condition that creates no suspicion about its authenticity, was located in a place where, if authentic, it would likely be, and would be at least 20 years old when offered at trial.

65. Attached hereto at TX_MSJ_006520 – TX_MSJ_006727, is a true and correct copy of U.S. Geological Survey Water-Supply Paper 1230, Ground-Water Conditions in the Rincon and Mesilla Valleys and Adjacent Areas in New Mexico, dated 1954. This document was produced by New Mexico during discovery. I have examined it and it appears identical to a report that I collected from the US Geological Survey Publication Warehouse (online) in my research. The document is in a condition that creates no suspicion about its authenticity, was located in a place where, if authentic, it would likely be, and would be at least 20 years old when offered at trial.

66. Attached hereto as TX_MSJ_006728 – TX_MSJ_006737, is a true and correct copy of the document entitled "Memorandum, Subject: Declaration of the Rio Grande Underground Water Basin," dated November 29, 1956. The document was produced by New Mexico during discovery. I have examined it and the document is in a condition that creates no suspicion about its authenticity, was located in a place where, if authentic, it would likely be, and would be at least 20 years old when offered at trial.

67. Attached hereto as TX_MSJ_006738 – TX_MSJ_006745, is a true and correct copy of the study entitled "Rio Grande, Elephant Butte Dam to El Paso, Texas," introduced as Exhibit 5 at the February 5, 2020 deposition of Peggy Barroll. I have examined this document and aside from the handwritten annotations on the first page, it appears identical to the copy I collected in the course of my research from the Joseph Friedkin Papers, C. L. Sonnichsen Special Collections Department, University of Texas at El Paso. The document is

in a condition that creates no suspicion about its authenticity, was located in a place where, if authentic, it would likely be, and would be at least 20 years old when offered at trial.

68. Attached hereto as TX_MSJ_006746 – TX_MSJ_006758, is a true and correct copy of the Minutes for the 1992 Rio Grande Compact Commission Meeting held March 26, 1992, at Alamosa, Colorado. The document was produced by Colorado during discovery. I have examined it and the document is in a condition that creates no suspicion about its authenticity, was located in a place where, if authentic, it would likely be, and would be at least 20 years old when offered at trial.

69. Attached hereto as TX_MSJ_006759 – TX_MSJ_006760, is a true and correct web printout copy of the Albuquerque Journal newspaper article entitled "Texas Itching for a Fight Over Rio Grande Water," published April 11, 2001. The document was produced by New Mexico during discovery. I have examined it and the document is in a condition that creates no suspicion about its authenticity, was located in a place where, if authentic, it would likely be, and would be at least 20 years old when offered at trial.

70. Attached hereto as TX_MSJ_006761 – TX_MSJ_006762, is a true and correct copy of a letter authored by John M. Baker, Commissioner for the Texas Natural Resource Conservation Commission, sent to Thomas C. Turney, New Mexico State Engineer and Secretary of the Interstate Stream Commission on April 27, 2001. The document was produced by Texas during discovery and was collected from the Texas Commission on Environmental Quality's "Rio Grande Compact General Cabinet." I have examined it and the document is in a condition that creates no suspicion about its authenticity, was located in a place where, if authentic, it would likely be, and would be at least 20 years old when offered at trial.

71. Attached hereto as TX_MSJ_006763 – TX_MSJ_006767, is a true and correct copy of the "Comments of Thomas C. Turney before United States Senate Committee of Energy and Natural Resources Field Hearing on Water Issues," held August 14, 2001 at New Mexico State University in Las Cruces, New Mexico. The document is a printout from the New Mexico Office of the State Engineer's website and was produced by New Mexico during discovery. I have examined it and the document is in a condition that creates no suspicion about its authenticity, was located in a place where, if authentic, it would likely be, and would be at least 20 years old when offered at trial.

72. Attached hereto as TX_MSJ_006768 – TX_MSJ_006770, is a true and correct web printout copy of the Santa Fe New Mexican article entitled "State is Bracing for a Water Dispute," published January 23, 2002. The document was produced by Texas during discovery. I am a person with knowledge of the matters in this litigation, and I have examined the document, have no reason to doubt its authenticity, and believe it is what it claims to be.

73. Attached hereto as TX_MSJ_006771 – TX_MSJ_006801, is a true and correct copy of the deposition of Thomas C. Turney, taken January 14, 2003. The document was produced by the EBID during discovery. I am a person with knowledge of the matters in this litigation, and I have examined the document, have no reason to doubt its authenticity, and believe it is what it is claimed to be.

74. Attached hereto as TX_MSJ_006802 – TX_MSJ_006817, is a true and correct copy of the March 15, 2003 Memo authored by Erek Fuchs to State Engineer John D'Antonio - EBID_160073. This document was produced by EBID during discovery. A non-Bates stamped copy was provided to me by Somach Simmons & Dunn. I am a person with knowledge of the matters in this litigation, and I have examined the document, have no reason

to doubt its authenticity, and believe it is what it is claimed to be; I relied on it in my expert rebuttal / supplemental report dated December 30, 2019.

75. Attached hereto as TX_MSJ_006818 – TX_MSJ_006822, is a true and correct copy of a facsimile sent to the New Mexico Office of the State Engineer and others on January 12, 2004, enclosing a letter (subject line: "Groundwater Pumping within EBID") authored by attorneys for the EP#1 and the El Paso Water Utilities Public Service Board, sent to Filiberto Cortez, El Paso Field Division Manager for the U.S. Bureau of Reclamation on January 5, 2004. The document was produced by EBID during discovery. I am a person with knowledge of the matters in this litigation, and I have examined the document, have no reason to doubt its authenticity, and believe it is what it is claimed to be.

76. Attached hereto as TX_MSJ_006823 – TX_MSJ_006825, is a true and correct copy of an email (subject line: "RE: Request for Meeting") authored by Susanne Hoffman-Dooley, AWRM Project Attorney for the New Mexico Office of the State Engineer, sent to Lee Leininger at the United States Department of Justice on March 23, 2006. The document was produced by the United States during discovery. I am a person with knowledge of the matters in this litigation, and I have examined the document, have no reason to doubt its authenticity, and believe it is what it is claimed to be.

77. Attached hereto as TX_MSJ_006826 – TX_MSJ_006829, is a true and correct copy of a letter (subject line: "Comments on the Second Draft of Rules and Regulations for Active Water Resources Administration of the Waters of the Lower Rio Grande Water Master District") authored by Rebecca Dempsey on behalf of the City of El Paso, sent to John D'Antonio, Office of the State Engineer on August 30, 2007. The document was produced by New Mexico during discovery. I am a person with knowledge of the matters in this litigation,

and I have examined the document, have no reason to doubt its authenticity, and believe it is what it is claimed to be.

I declare under penalty of perjury that the foregoing is true and correct. Executed this 21st day of December 2020 at Davis, California.

Scott A. Miltenberger, Ph.D.

Exhibit 6

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

THE STATE OF TEXAS'S DISCLOSURE OF EXPERT WITNESSES

STUART L. SOMACH, ESQ.*
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ROBERT B. HOFFMAN, ESQ.
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**Counsel of Record*

May 31, 2019

TO ALL PARTIES AND THEIR ATTORNEYS OF RECORD:

Pursuant to Rule 26(a)(2) of the Federal Rules of Civil Procedure, and the Case Management Plan executed by the Honorable Michael J. Melloy, Special Master, on September 6, 2018, and amendments thereto, Plaintiff, State of Texas (Texas) hereby discloses the identities of the following retained experts:

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In accordance with Rule 26(a)(2)(B) of the Federal Rules of Civil Procedure, and the Case Management Plan executed by the Honorable Michael J. Melloy, Special Master, on September 6, 2018, and amendments thereto, and agreement between the parties, written reports prepared and signed by the above-referenced retained experts are served concurrently herewith. All written reports and supporting data, files, and references are available to download here:

https://somachlaw.sharefile.com/d-sce52e1d82124c9da

The documents will remain available to download for 30 days, after which time, the link will expire. Thereafter, the documents will be available through the Veritext vault.

Pursuant to Rule 26(a)(2)(C) of the Federal Rules of Civil Procedure, and the Case Management Plan executed by the Honorable Michael J. Melloy, Special Master, on September 6, 2018, and amendments thereto, Texas discloses the following non-retained experts:

1. John E. Balliew, P.E.
President & CEO
El Paso Water Utilities Public Service Board, City of El Paso
1154 Hawkins Blvd.
El Paso, TX 79925

Subject matter: (1) city, county, special district, political subdivision, state and/or federal agency contracts, agreements, regulation, action, inaction, and/or oversight related to and/or impacting the Project and/or Compact; (2) analyses of the evolution of consumptive use and the impacts therefrom; and (3) injuries sustained and/or damages incurred by Texas.

2. Al Blair
District Engineer, El Paso County Water Improvement District #1
13247 Alameda Ave.
Clint, TX 79836

District Engineer, Hudspeth County Underground Water Conservation District #1
71920 Texas Highway 20
Fort Hancock, TX 79839

Subject matter: (1) the management and administration of the Compact; (2) technical analyses, management and operation of the Project, including but not limited to issues related to Project deliveries, surface water flows and diversions, groundwater pumping and/or the interconnections between Rio Grande surface flow and groundwater; (3) intrastate, interstate, and/or international surface and groundwater operations and management issues in the Rio Grande watershed; (4) Project and Compact accounting; (5) city, county, special district, political subdivision, state and/or federal agency contracts, agreements, regulation, action, inaction, and/or oversight related to and/or impacting the Project and/or Compact; (6) analyses of agricultural management and practices; (7) analyses of the evolution of consumptive use and the impacts therefrom; and (8) injuries sustained and/or damages incurred by Texas.

3. Gary L. Esslinger
Elephant Butte Irrigation District Manager and Treasurer
530 S. Melendres St.
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Subject matter: (1) the management and administration of the Compact; (2) technical analyses, management and operation of the Project, including but not limited to

issues related to Project deliveries, surface water flows and diversions, groundwater pumping and/or the interconnections between Rio Grande surface flow and groundwater; (3) intrastate, interstate, and/or international surface and groundwater operations and management issues in the Rio Grande watershed; (4) Project and Compact accounting; (5) city, county, special district, political subdivision, state and/or federal agency contracts, agreements, regulation, action, inaction, and/or oversight related to and/or impacting the Project and/or Compact; (6) analyses of agricultural management and practices; and (7) analyses of the evolution of consumptive use and the impacts therefrom.

4. Art Ivey
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Subject matter: (1) city, county, special district, political subdivision, state and/or federal agency contracts, agreements, regulation, action, inaction, and/or oversight related to and/or impacting the Project and/or Compact; (2) analyses of agricultural management and practices; (3) analyses of the evolution of consumptive use and the impacts therefrom; and (4) injuries sustained and/or damages incurred by Texas.

5. J. Phillip King
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Subject matter: (1) city, county, special district, political subdivision, state and/or federal agency contracts, agreements, regulation, action, inaction, and/or oversight related to and/or impacting the Project and/or Compact; (2) analyses of agricultural management and practices; (3) analyses of the evolution of consumptive use and the impacts therefrom; and (4) injuries sustained and/or damages incurred by Texas.

Texas reserves the right to rely upon and use the testimony of any and all expert witnesses identified by all parties to this action and to present rebuttal testimony to any such witness through those listed here or other expert witnesses. Texas also reserves the right to amend or supplement this disclosure pursuant to Federal Rules of Civil Procedure 26(a)(2) and 26(e).

Dated: May 31, 2019

Respectfully submitted,

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

CERTIFICATE OF SERVICE

This is to certify that on this 31st day of May 2019, I caused a true and correct copy of **THE STATE OF TEXAS'S DISCLOSURE OF EXPERT WITNESSES** to be served 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 effected by electronic mail to those individuals listed on the attached service list, which reflects all updates and revisions through the current date.

Respectfully submitted,

Dated: May 31, 2019

Christina Garro

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Exhibit 7

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

STATE OF NEW MEXICO'S DISCLOSURE OF EXPERT WITNESSES

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October 31, 2019

TO ALL PARTIES AND THEIR ATTORNEYS OF RECORD:

Pursuant to Federal Rule of Civil Procedure 26(a)(2) and the Case Management Plan adopted by the Honorable Michael J. Melloy, Special Master, on September 6, 2018, as amended ("CMP"), Defendant, State of New Mexico ("New Mexico") hereby discloses the identities of the following retained experts:

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(303) 861-9700

In accordance with Federal Rule of Civil Procedure 26(a)(2)(B) and the CMP, and agreement between the parties, written reports prepared and signed by the above-referenced retained experts are served concurrently herewith. With the exception of certain model data, which has been transmitted to the named parties via portable hard drives, all written reports and supporting data, files, and references are available to download using the following link:

https://troutlaw.sharefile.com/d-sfc998081a5042d1a

New Mexico is also transmitting all reports and other disclosures to the Veritext Vault, including model data, and will notify all parties and amici when they are available from Veritext.

New Mexico reserves the right to rely upon and use the testimony of any and all expert witnesses identified by all parties to this action and to present rebuttal testimony to any such witness through those listed here or other expert witnesses. New Mexico also reserves the right to amend or supplement this disclosure pursuant to Federal Rules of Civil Procedure 26(a)(2) and 26(e).

Respectfully submitted: October 31, 2019.

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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

_____♦_____

STATE OF NEW MEXICO'S CERTIFICATE OF SERVICE

_____♦_____

This is to certify that on the 31st of October, 2019, I caused a true and correct copy of the **State of New Mexico's Disclosure of Expert Witnesses** to be served by e-mail on all counsel of record and interested parties on the Service List, attached hereto.

Respectfully submitted this 31st day of October, 2019.

/s/ Michael A. Kopp
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Exhibit 8

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

THE STATE OF TEXAS'S DISCLOSURE OF REBUTTAL EXPERT WITNESSES

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ANDREW M. HITCHINGS, ESQ.
ROBERT B. HOFFMAN, ESQ.
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**Counsel of Record*

December 30, 2019

TO ALL PARTIES AND THEIR ATTORNEYS OF RECORD:

Pursuant to Rule 26(a)(2) of the Federal Rules of Civil Procedure, and the Case Management Plan executed by the Honorable Michael J. Melloy, Special Master, on September 6, 2018, and amendments thereto, Plaintiff, State of Texas (Texas) hereby discloses the identities of the following retained rebuttal experts:

1. Travis Brooks
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   Sacramento, CA 95811
   (916) 265-6330

2. Shane Coors, P.E.
   Precision Water Resources Engineering, LLC.
   3401 E County Road 16
   Loveland, CO 80537
   (720) 261-7007

3. Jonathan D. George, P.E.
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6. William R. Hutchison, Ph.D., P.E., P.G.
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7. Joel Kimmelshue, Ph.D., CPSS
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8. Leonardo Lombardini, Ph.D.[1]
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In accordance with Rule 26(a)(2)(B) of the Federal Rules of Civil Procedure, and the Case Management Plan executed by the Honorable Michael J. Melloy, Special Master, on September 6, 2018, as amended, and agreement between the parties, written

[1] Dr. Lombardini's supplemental expert report addresses field work that was conducted in July and August, 2019, that could not have been completed prior to the start of discovery, as set forth in the September 6, 2018 Case Management Plan, as amended. Discovery commenced in this matter on September 1, 2018. *See* App. B. to Case Management Plan. Dr. Lombardini's report analyzes whether soil salinity has an impact on agricultural productivity in the Rio Grande region, based on samples collected at 14 farms during the agricultural growing season. *See* Lombardini Report at 1. The summer/fall 2019 growing season is the only full agricultural growing season during the discovery period in this litigation. As a result, Texas could not have produced Dr. Lombardini's report by the May 31, 2019 initial expert disclosure deadline.

reports prepared and signed by the above-referenced retained rebuttal experts are served concurrently herewith. All written reports and supporting data, files, and references are available to download using the following link:

https://somachlaw.sharefile.com/d-s6e8c29252e24965b

The documents will remain available to download for 30 days, after which time, the link will expire. Thereafter, the documents will be available via the VeritextVault.

Pursuant to Rule 26(a)(2)(C) and (D) of the Federal Rules of Civil Procedure, and the Case Management Plan executed by the Honorable Michael J. Melloy, Special Master, on September 6, 2018, as amended, Texas discloses the following non-retained rebuttal experts:

1. Erek H. Fuchs, Ph.D.
   Elephant Butte Irrigation District Groundwater Resources Director
   530 S. Melendres Street
   Las Cruces, NM 88005

Subject matter: New Mexico water rights administration, management and regulation.

Dr. Fuchs will offer specific facts and opinions from the perspective of his EBID Groundwater Resources Director position, which may include, but are not limited to the following: Testimony regarding New Mexico's management and regulation of groundwater pumping, including implementation and enforcement of statutes and regulations on groundwater pumping and offset requirements; (2) historical and current summary of water administration; and (3) impact of water rights administration upon hydrologic conditions and related surface groundwater interactions in the lower Rio Grande stream system.

The retained and non-retained rebuttal witnesses identified herein, and the opinions reflected in the written reports and supporting data, files, and references, are not intended to critique every error made by New Mexico experts and should not be

construed as acceptance of any of New Mexico experts' opinions that are not expressly addressed and/or otherwise challenged by the identified rebuttal witnesses. Texas reserves its right to further critique New Mexico experts' opinions and analyses at the time of trial.

Texas further continues to reserve its right to rely upon and use the testimony of any and all expert witnesses identified by all parties to this action and to present rebuttal testimony to any such witness through those listed here or other expert witnesses. Texas also reserves the right to amend or supplement this disclosure pursuant to Federal Rules of Civil Procedure 26(a)(2) and 26(e).

Dated: December 30, 2019

Respectfully submitted,

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.

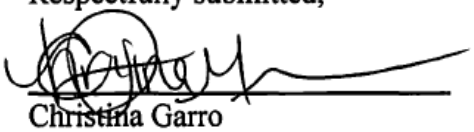
OFFICE OF THE SPECIAL MASTER

CERTIFICATE OF SERVICE

This is to certify that on this 30th day of December 2019, I caused a true and correct copy of **THE STATE OF TEXAS'S DISCLOSURE OF REBUTTAL EXPERT WITNESSES** to be served 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 effected by electronic mail to those individuals listed on the attached service list, which reflects all updates and revisions through the current date.

Dated: December 30, 2019

Respectfully submitted,



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IN THE SUPREME COURT OF THE UNITED STATES
BEFORE THE OFFICE OF THE SPECIAL MASTER
HON. MICHAEL J. MELLOY

STATE OF TEXAS	)	
	)	
Plaintiff,	)	
	)	Original Action Case
VS.	)	No. 220141
	)	(Original 141)
STATE OF NEW MEXICO,	)	
and STATE OF COLORADO,	)	
	)	
Defendants.	)	

****

REMOTE ORAL AND VIDEOTAPED DEPOSITION OF
WILLIAM R. HUTCHISON
MAY 28, 2020

****

REMOTE ORAL AND VIDEOTAPED DEPOSITION of WILLIAM R. HUTCHISON, produced as a witness at the instance of the Defendant State of New Mexico, and duly sworn, was taken in the above-styled and numbered cause on May 28, 2020, from 9:05 a.m. to 4:35 p.m., before Heather L. Garza, CSR, RPR, in and for the State of Texas, recorded by machine shorthand, at the offices of HEATHER L. GARZA, CSR, RPR, The Woodlands, Texas, pursuant to the Federal Rules of Civil Procedure and the provisions stated on the record or attached hereto; that the deposition shall be read and signed.

have you been doing since December, 2019?

A. Since December, 2019, I've continued to review the New Mexico expert reports, running their models, the groundwater models, comparing results with mine. I've attended depositions in Denver. I did spend a little bit of time reviewing the new USGS model, the updated one that they released again in April. I think that about covers it.

Q. On your ongoing review of the model results both from, you know, New Mexico's model in comparison to yours, are you planning to provide any supplemental disclosures related to that work?

A. At this point, I'm providing information to counsel, and when requested, to other experts.

Q. And what other experts are you working with in providing that material?

A. Well, I've provided information and results from the MODFLOW models to Shane Coors as part of his work on -- he's primarily reviewing the RiverWare model, and to the extent they interacted/overlapped, I've been providing MODFLOW results to him.

Q. Do you know if Shane Coors has also been running the MODFLOW models or has that really been your work that you've been providing to Shane Coors?

A. My understanding is he's running -- he has to

run the MODFLOW models in order to run the entire integrated model so to that extent, he's been doing that. The results he's been extracting have been from -- from the RiverWare model is my understanding.

Q. Do you know whether or not Shane Coors, his ongoing work, if there is plans to have another supplemental disclosure from Shane Coors?

A. I don't know one way or the other.

Q. Okay.

A. That's Shane.

Q. Have you reviewed Shane Coors' supplemental report that he disclosed in this case?

A. Yes.

Q. And did you review Jean Moran or Stetson Engineering report that was disclosed in the supplemental disclosure in the case?

A. Yes.

Q. Have you done any additional analysis related to the Stetson Engineering report? And -- and when I say "any additional analysis," you know, she -- Jean Moran states that results related to the Texas report and so I'm -- I'm curious, you know, if you have reviewed her materials and come to any conclusions?

A. I don't really think I understand what you're -- what you're asking. Results related to the

IN THE SUPREME COURT OF THE UNITED STATES
BEFORE THE OFFICE OF THE SPECIAL MASTER
HON. MICHAEL J. MELLOY

STATE OF TEXAS	)	
	)	
Plaintiff,	)	
	)	Original Action Case
VS.	)	No. 220141
	)	(Original 141)
STATE OF NEW MEXICO,	)	
and STATE OF COLORADO,	)	
	)	
Defendants.	)	

THE STATE OF TEXAS :
COUNTY OF HARRIS :

I, HEATHER L. GARZA, a Certified Shorthand Reporter in and for the State of Texas, do hereby certify that the facts as stated by me in the caption hereto are true; that the above and foregoing answers of the witness, WILLIAM R. HUTCHISON, to the interrogatories as indicated were made before me by the said witness after being first remotely duly sworn to testify the truth, and same were reduced to typewriting under my direction; that the above and foregoing deposition as set forth in typewriting is a full, true, and correct transcript of the proceedings had at the time of taking of said deposition.

I further certify that I am not, in any capacity, a regular employee of the party in whose

behalf this deposition is taken, nor in the regular employ of this attorney; and I certify that I am not interested in the cause, nor of kin or counsel to either of the parties.

That the amount of time used by each party at the deposition is as follows:

MS. THOMPSON - 05:31:20
MR. GOLDSBERRY - 00:00:00
MR. DUBOIS - 00:00:00
MR. WALLACE - 00:00:45
MS. O'BRIEN - 00:00:00
MS. BARNCASTLE - 00:00:00

GIVEN UNDER MY HAND AND SEAL OF OFFICE, on this, the 21st day of June, 2020.

HEATHER L. GARZA, CSR, RPR, CRR
Certification No.: 8262
Expiration Date: 04-30-22

Worldwide Court Reporters, Inc.
Firm Registration No. 223
3000 Weslayan, Suite 235
Houston, TX 77027
800-745-1101

Exhibit 10

May 31, 2019

EXPERT REPORT OF:
William R. Hutchison

In the matter of:

No. 141, Original
In the Supreme Court of the United States
State of Texas v. State of New Mexico and State of Colorado

Prepared for:

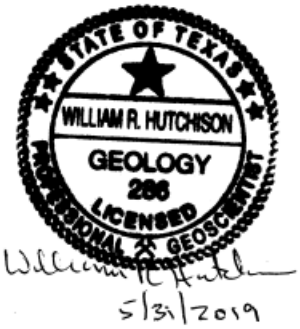
Somach Simmons & Dunn
500 Capitol Mall, Suite 1000
Sacramento, CA 95814

Prepared by:

William R. Hutchison

William R. Hutchison, Ph.D., P.E., P.G.
9305 Jamaica Beach
Jamaica Beach, TX 77554

5/31/2019



5/31/2019

discrepancies between the model results and the input spreadsheet (*Canal.V10.3-2010update.xlsx*) estimates that could not be resolved without a more complete understanding of how some of the input files were developed. These details may have been clearer if the unavailable files had been available and had been reviewed (i.e. *cellinfo.xls, rechdist2_withfilepicker.exe, Well.dll,* and *Well.f90*).

32. Based on the review completed in late 2012 and early 2013, and the unanswered questions regarding the OSE model, I began developing a new model that used the OSE model as a foundation. The updated model added additional (and updated) data that were developed specifically for this effort by consultants for the State of Texas as described below.

4.0 New Groundwater Model (Texas Model)

33. The new groundwater model that was developed as part of this effort is called the Texas Model.

34. The foundation of the Texas Model is the OSE 2007 model, which represented the latest evolutionary step of a series of models that had been developed since the 1980s. Updated data on the geologic framework, agricultural consumptive use, agricultural pumping, and deep infiltration of irrigation water were developed and used in this effort.

4.1 Questions Addressed by Texas Model

35. The model was developed to answer the following specific questions that were posed by Counsel for the State of Texas:

a) What is the nature and extent of hydrologically connected groundwater and its relationship to the Rio Grande and the Rio Grande Project and the relevant issues raised in the Texas Complaint?

b) What was the 1938 condition that should be used as the basis upon which to judge New Mexico's actions and the effect of those actions?

c) Have New Mexico's actions depleted the quantity of water available below Elephant Butte Reservoir, and if so, (a) what was the cause of these depletions and (b) what was the extent (quantification) of these depletions?

d) If groundwater pumping in New Mexico were regulated to control the amount of water pumped, would it decrease or eliminate the effects on surface flows in the Rio Grande? Would the system recover to levels that existed in 1938 (i.e. the baseline condition)? If so, how long would it take to recover?

4.2 Summary Answers to Questions

36. Summary answers to the questions outlined above are provided below. More complete answers are developed later in this expert report and the associated technical memoranda.

a) Surface water and groundwater are connected in the Rincon and Mesilla Valleys. As water flows in a stream, canal, or river, the flow in the stream, canal, or river, the flow can either increase from the inflow of groundwater or decrease due to losses to the underlying aquifer. When groundwater elevations are higher than surface water elevations, groundwater flows into the surface water body and surface flow increases (Figure 1). When groundwater elevations are lower than surface water elevations, surface water flows into the surrounding aquifer and surface flow decreases (Figures 2 and 3). Figures 2 and 3 illustrate two types of losing stream conditions. Figure 2 illustrates a condition where groundwater elevations are lower than the stream edges, but still connected to the stream bottom. Figure 3 illustrates a condition where groundwater elevations have dropped lower than the stream bottom elevation. In the case of a disconnected stream, the seepage rate out of the stream has reached its maximum. One of the impacts of groundwater pumping is the reduction of groundwater elevations (also known as drawdown). This drawdown has resulted in a condition where the Rio Grande was generally gaining flow from the inflow of groundwater prior to 1950 to a condition where the Rio Grande generally is a losing stream that recharges the aquifer. The Texas Model was designed to simulate the details of the nature of the surface water/groundwater interaction and quantify how it has changed through time.

conjunctive use scenarios as discussed below.

11.4 Conjunctive Use Scenarios

143. For purposes of this analysis, the use of groundwater to make up deficits in surface water flows to meet agricultural demands is generally referred to as conjunctive use of surface water and groundwater. This definition of conjunctive use is generally consistent with how conjunctive use is defined and applied in the City of El Paso (preferential use of surface water to meet municipal demands and increase groundwater pumping to meet deficits in surface water supply).

144. The consumptive use scenarios discussed above were based on a set consumptive use limit. The results, however, demonstrated the importance of groundwater pumping in estimating Rio Grande Flow at El Paso. From a practical management perspective and from the perspective to evaluate remedies, this group of simulations evaluated alternative hypothetical scenarios where historic groundwater pumping only occurred in years with less than specific amounts of surface water availability. These simulations are documented in Technical Memorandum 21.

145. Prior to the drought of the 1950s, agricultural pumping was minimal. Partly in response to drought conditions and partly as a result of the initial availability of deep turbine pumps, groundwater pumping began in the 1950s. Annual groundwater pumping, which consists of agricultural pumping and urban and domestic pumping, from 1938 to 2016 is presented in Figure 18.

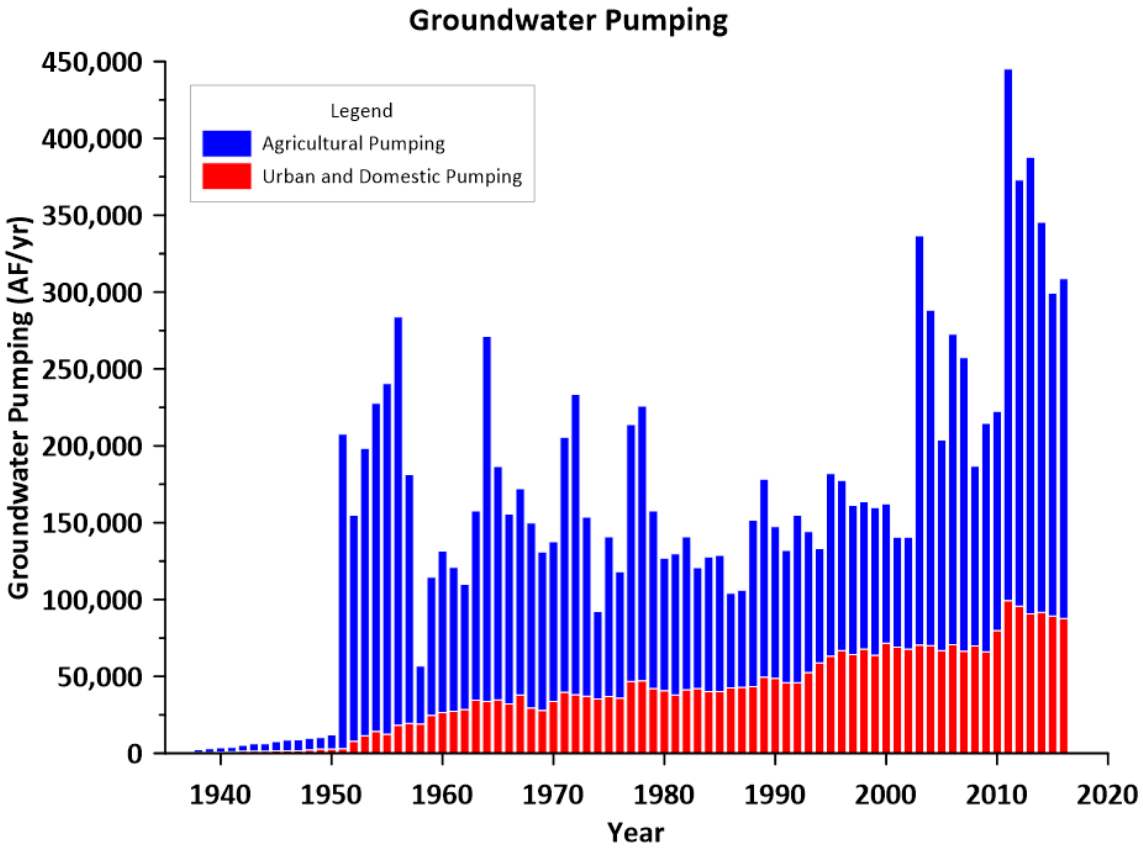


Figure 18. Historic Groundwater Pumping

146. Surface water availability was defined by releases to the Rio Grande from Caballo Reservoir. From 1938 to 2016, annual releases ranged from about 170,000 AF/yr (2013) to about 1.8 million AF/yr (1942).

147. For purposes of these simulations:

- Scenario 1 assumed that groundwater pumping is zero when annual releases from Caballo are above 790,000 AF/yr (i.e. no pumping in 13 years, historic pumping in 66 years)
- Scenario 2 assumed that groundwater pumping is zero when annual releases from Caballo are above 700,000 AF/yr (i.e. no pumping in 30 years, historic pumping in 49 years)
- Scenario 3 assumed that groundwater pumping is zero when annual releases from Caballo are above 600,000 AF/yr (i.e. no pumping in 52 years, historic pumping in 27 years)

- Scenario 4 assumed that groundwater pumping is zero when annual releases from Caballo are above 500,000 AF/yr (i.e. no pumping in 60 years, historic pumping in 19 years)
- Scenario 5 assumed that groundwater pumping is zero when annual releases from Caballo are above 400,000 AF/yr (i.e. no pumping in 66 years, historic pumping in 13 years)

148. Results include the estimated flow of the Rio Grande at El Paso. Comparison of the results of the alternative scenarios yielded quantified estimates of various levels of pumping reductions and an evaluation of their significance.

149. As the threshold value of Rio Grande at Caballo decreases (from 790,000 to 400,000 AF/yr), average Rio Grande at El Paso flows (1951-2016) increase.

150. The results demonstrate that limiting groundwater pumping during years with low river flow has a similar effect as long term reductions in pumping. For example, Figure 19 presents a hydrograph of Rio Grande at El Paso flow that compares actual historic flow, the results of reduced pumping scenario 6 (60 percent reduction of pumping in all years), and the results of conjunctive use Scenario 3 (pumping at historic levels when Rio Grande Flow at Caballo is less than 600,000 AF/yr, zero when Rio Grande Flow at Caballo is greater than 600,000 AF/yr).

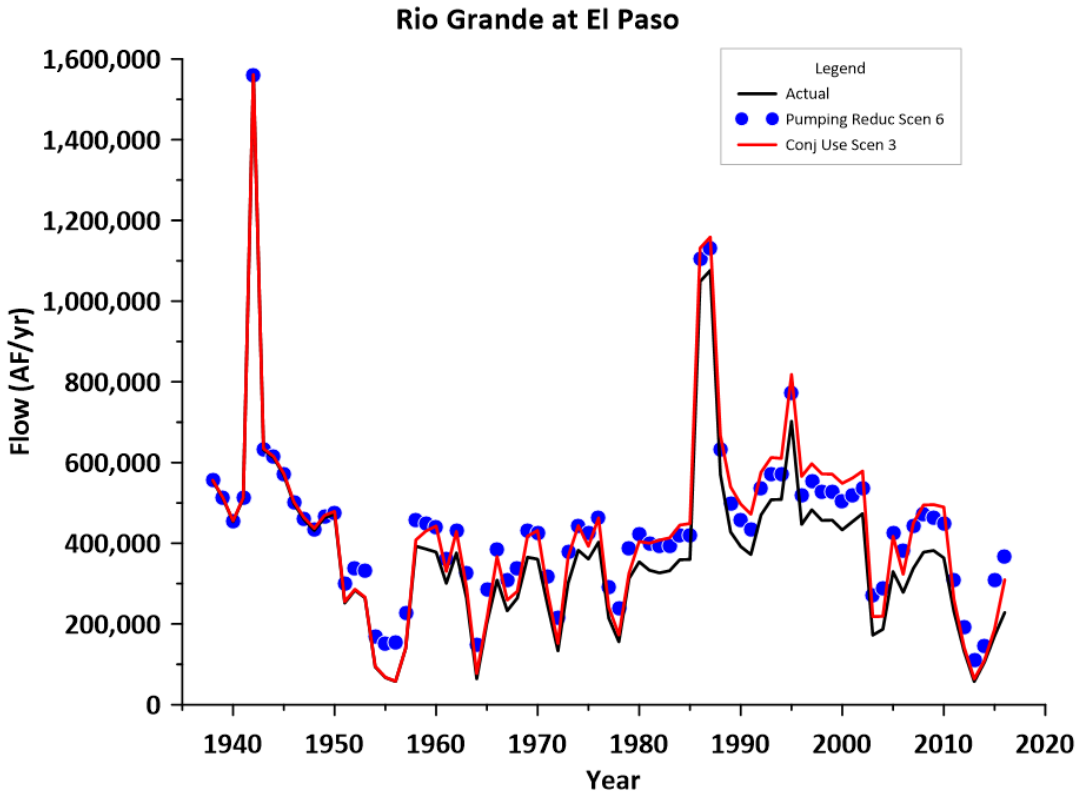


Figure 19. Rio Grande at El Paso - Pumping Reduction Scenario 6 and Conjunctive Use Scenario 3

151. During drought periods, the conjunctive use scenario estimates Rio Grande at El Paso flows that are near historic as a result of groundwater pumping. However, during periods of no pumping (in the case presented in Figure 19, when Rio Grande at Caballo flow is greater 600,000 AF/yr), Rio Grande flows at El Paso are about the same as the scenario where pumping in all years is reduced 60 percent.

152. Under this scenario, Rio Grande at El Paso flows would be low in drought years (i.e. years with pumping), but in years with high reservoir releases, pumping would cease, and groundwater levels would recover. This, in turn, would lead to a return to many years with gaining stream conditions that has not been observed since 1951 due to uninterrupted groundwater pumping.

Exhibit 11

December 23, 2019

REBUTTAL REPORT OF:
William R. Hutchison

In the matter of:

No. 141, Original
In the Supreme Court of the United States
State of Texas v. State of New Mexico and State of Colorado

Prepared for:

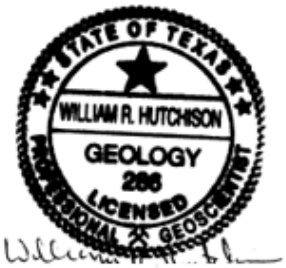
Somach Simmons & Dunn
500 Capitol Mall, Suite 1000
Sacramento, CA 95814

Prepared by:

William R. Hutchison

William R. Hutchison, Ph.D., P.E., P.G.
9305 Jamaica Beach
Jamaica Beach, TX 77554

12/23/2019



12/23/2019

Table of Contents

1.0 Introduction

1. My name is William R. Hutchison, Ph.D., P.E., P.G. I have been retained by the State of Texas to provide consulting services on hydrologic issues presented in the Lawsuit. My professional background and specific qualifications are detailed in my May 31, 2019 Expert Report submitted for this case (Hutchison, 2019).

2.0 Question Posed by Counsel for State of Texas

2. Counsel for the State of Texas asked me to review the groundwater flow model of the Hueco Bolson submitted by the State of New Mexico (Spalding and Morrissey, 2019) and asked the following question:

> *Is the new Spalding and Morrissey (2019) model of the Hueco Bolson a better model than the existing USGS model of the Hueco Bolson (Heywood and Yager, 2003) to address issues associated with the Lawsuit?*

3.0 Summary of Conclusions and Opinions

3. As developed in this rebuttal report, the opinions that Spalding and Morrissey articulated in their expert report could have been drawn from the results of the USGS model of the Hueco Bolson (Heywood and Yager, 2003) and from the results of the application of the USGS model since its publication.

4. In the submitted version of the Spalding and Morrisey (2019) model, the solution failed to converge in about 28 percent of the stress periods. Convergence failure is a flaw in the model that was not discussed, described, or documented in the companion report (Spalding and Morrisey, 2019).

5. The USGS model (Heywood and Yager, 2003) has been subjected to peer review (Bredehoeft and others, 2004), and has been designated as the official Groundwater Availability Model for the Hueco Bolson by the Texas Water Development Board (model files documented in Hutchison, 2002).

6. The USGS model (Heywood and Yager, 2003) and has been used in research that has been reported in peer-reviewed journal articles (e.g. Sheng and Devere, 2005; Druhan and others, 2008; Hutchison and Hibbs, 2008, and Eastoe and others, 2010).

7. The USGS model (Heywood and Yager, 2003) has been used for practical applications (e.g. Hutchison, 2003; Hutchison and others, 2003; Hutchison, 2004; and Hutchison, 2006).

8. The results of the USGS model were also used as the basis for the conjunctive use strategy of surface water and groundwater in El Paso articulated in the Integrated Water Management Strategies for the City and County of El Paso (Gooch and others, 2006).

9. Based on this review, the USGS model is a more appropriate model to base any opinions and conclusions relative to the Hueco Bolson for this litigation.

4.0 Spalding and Morrisey Hueco Bolson Groundwater Flow Model

10. The State of New Mexico has disclosed an expert report by Charles P. Spalding, P.G. and Daniel J. Morrisey, P.G. that described a groundwater flow model of the Hueco Bolson from the Courchesne Bridge in El Paso to Fort Quitman, Texas (Spalding and Morrisey, 2019).

Devere (2005), Hutchison (2006), Druhan and others (2008), Hutchison and Hibbs (2008), and Eastoe and others (2010).

19. The USGS model (Heywood and Yager, 2003) and the update completed by Hutchison (2004) were peer reviewed by a panel of groundwater modeling experts hired by El Paso Water Utilities. The peer review panel's findings were documented in Bredehoeft and others (2004).

20. The USGS model (Heywood and Yager, 2003) was designated as the Groundwater Availability Model for the Hueco Bolson by the Texas Water Development Board. The model files were documented in Hutchison (2002).

21. The USGS model (Heywood and Yager, 2003) and the update completed by Hutchison (2004) have been used in research and practical applications. Examples of research papers that have used the results of the USGS model (Heywood and Yager, 2003) include Druhan and others, 2003; Sheng and Devere, 2005; Hutchison and Hibbs (2008) and Eastoe and others (2010). Examples of practical applications include Hutchison (2003), Hutchison and others (2003), Hutchison (2004), Hutchison (2006).

22. On a practical level, it has been demonstrated that the USGS model is a good representation of the groundwater system through its use as the basis for locating the production wells for the Kay Bailey Hutchison desalination plant in El Paso (e.g. Hutchison and others, 2003, Hutchison, 2004 and Hutchison, 2006), and in initial planning efforts for an additional desalination plant in El Paso (Hutchison, 2003).

23. The model results from the USGS model (Heywood and Yager, 2003) were also used as the basis for the conjunctive use strategy of surface water and groundwater in El Paso articulated in the Integrated Water Management Strategies for the City and County of El Paso

(Gooch and others, 2006). This conjunctive use strategy contained in the 2006 regional water plan (Far West Texas Water Planning Group, 2006) has also been included and updated in subsequent updates to the regional water plan (Far West Texas Water Planning Group, 2011 and Far West Texas Water Planning Group, 2016).

6.0 References

Bredehoeft, J., Ford, J., Harden, B., Mace, R., and Rumbaugh, J., 2004. Review and Interpretation of the Hueco Bolson Groundwater Model. Prepared for El Paso Water Utilities, March 2004. 18p.

Druhan, J.L., Hogan, J.F., Eastoe, C.J., Hibbs, B.J., and Hutchison W.R., 2008. Hydrogeologic Controls on Groundwater Recharge and Salinization: A Geochemical Analysis of the Northern Hueco Bolson Aquifer, El Paso, Texas, USA. Hydrogeology Journal, Vol. 16, No. 2, pp. 281-296.

Eastoe, C.J., Hutchison, W.R., Hibbs, B.J., Hawley, J., and Hogan, J F., 2010. Interaction of a River with an Alluvial Basin Aquifer: Stable Isotopes, Salinity and Water Budgets. Journal of Hydrology. doi:10.1016/j.jhydrol.2010.10.012.

Far West Texas Water Planning Group, 2006. Far West Texas Water Plan. Prepared for Texas Water Development Board, January 2006. 601p.

Far West Texas Water Planning Group, 2011. Far West Texas Water Plan. Prepared for Texas Water Development Board, January 2006. 639p.

Far West Texas Water Planning Group, 2016. Far West Texas Water Plan. Prepared for Texas Water Development Board, January 2006. 452p.

Gooch, T.C., Salazar, A., Kiel, S., and Ashworth, J., 2006. Integrated Water Management Strategies for the City and County of El Paso. Prepared for Far West Texas Planning Group, January 5, 2006. 143p.

Heywood, C.E. and Yager, R.M., 2003. Simulated Ground-Water Flow in the Hueco Bolson, an Alluvial-Basin Aquifer System near El Paso, Texas. U.S. Geological Survey Water Resources Investigations Report 02-4108. Prepared in cooperation with El Paso Water Utilities and U.S. Army – Fort Bliss. 80p.

Hutchison, W.R., 2002. Documentation of Files for Steady State and Annual Versions of Groundwater Flow Model of Hueco Bolson. El Paso Water Utilities Hydrogeology Report 02-01. 55p.

Exhibit 12

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 GREGORY SULLIVAN, P.E.
IN SUPPORT OF THE STATE OF NEW MEXICO'S MOTION TO STRIKE
TEXAS'S LATE-FILED EXPERT OPINIONS OR FOR ALTERNATIVE RELIEF

I, Gregory K. Sullivan, 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 information stated herein.
2. A description of my professional qualifications and prior work in this litigation can be found in my Declaration dated December 21, 2020, filed as exhibit NM-EX 012 with the State of New Mexico's Response to the State of Texas's Motion for Partial Summary Judgment and the State of New Mexico's Response to the United States' Motion for Partial Summary Judgment.
3. Texas previously disclosed the Expert Report of Robert J. Brandes Texas dated May 31, 2019 ("Brandes Report"), the Expert Report of William R. Hutchison dated May 31, 2019 ("Hutchison Report"), and the Rebuttal Report of William R. Hutchison dated December 23, 2019 ("Hutchison Rebuttal").
4. As part of its November 5, 2020 Motion for Partial Summary Judgment, Texas submitted the Declaration of Robert J. Brandes, P.E., Ph.D dated November 5, 2020 ("Brandes Nov. Declaration").
5. Texas also submitted the Declaration of William R. Hutchison dated November 5, 2020 ("Hutchison Declaration") with its November 5, 2020 Motion for Partial Summary Judgment.
6. On December 22, 2020 Texas submitted the Declaration of Robert J. Brandes, P.E., Ph.D in Support of the State of Texas's Oppositions to the State of New Mexico's Motions of Partial Summary Judgment and Briefs in Support ("Brandes Dec. Declaration").

7. I was asked by legal counsel for New Mexico to review the Brandes Declarations and the Hutchison Declaration and assess whether any of the statements in these Declarations constitute new opinions that are outside the scope of their expert reports.

8. The Brandes Declarations contain multiple new opinions that are not found within, and exceed the scope of, the Brandes Report. In particular, the Brandes Nov. Declaration contains new opinions on the Compact apportionment to Texas. Brandes Nov. Declaration 7, 14 (¶¶ 21, 36). In the Brandes Dec. Declaration, Dr. Brandes presents opinions, for the first time, on New Mexico's Integrated Lower Rio Grande Model ("Integrated Model"), which New Mexico disclosed in October 2019; new opinions based on data, opinions and analysis disclosed by Texas expert Mr. Coors in his May 2020 expert report; and new opinions on the 2008 Operating Agreement. Brandes Dec. Declaration 3-10 (¶¶ 8-11, 17, 19, 23-24, 31).

9. The Hutchison Declaration also contains new opinions that are not found within, and exceed the scope of, the Hutchison Report and the Hutchison Rebuttal. The new opinions and analysis in the Hutchison Declaration primarily concern New Mexico's Integrated Model, which New Mexico disclosed in October 2019, and on which Dr. Hutchison has not previously provided any opinions. These new opinions concern both the suitability of the Integrated Model to address the questions raised in this case as well as various simulation runs of the Integrated Model performed by New Mexico's experts, which were also disclosed in October 2019 (as updated in July and September 2020). These new opinions are contained on pages 7-13 (¶¶ 35-61) of the Hutchison Declaration. The Hutchison Declaration also contains new opinions relating to conjunctive water management. Those new opinions are contained on page 13 (¶¶ 62-66) of the Hutchison Declaration.

10. Texas provided no backup data, spreadsheets, or other documentation to support the new opinions included in the Brandes Nov. Declaration, the Brandes Dec. Declaration, or the Hutchison Declaration. Without this backup information, it is not possible to thoroughly review the bases for these new opinions.

11. Even if Texas discloses the backup data, spreadsheets, and other supporting documentation for the Brandes Declarations and the Hutchison Declaration, assessing and responding to the new opinions contained in these declarations will require considerable additional analysis, and may require myself and other New Mexico experts to issue one or more supplemental rebuttal reports, causing delay in the trial of this matter.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on February 12, 2021

Gregory K. Sullivan, P.E.

Exhibit 13

May 31, 2019

EXPERT REPORT OF ROBERT J. BRANDES

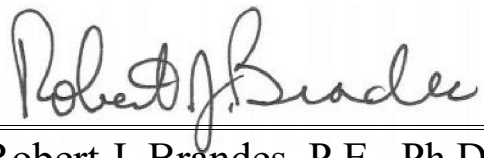
In the matter of:

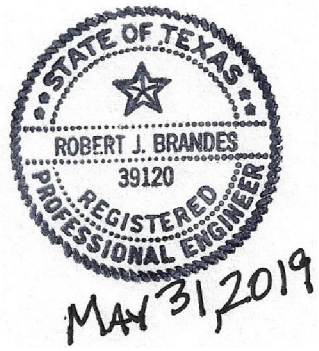
No. 141, Original
In the Supreme Court of the United States
State of Texas v. State of New Mexico and State of Colorado

Prepared for:

Somach Simmons & Dunn
500 Capitol Mall, Suite 1000
Sacramento, CA 95814

Prepared by:





Robert J. Brandes, P.E., Ph.D.
Robert J. Brandes Consulting
6000 Maurys Trail
Austin, Texas 78730

1.0 INTRODUCTION

My name is Robert John Brandes. I have been engaged in consulting engineering practice in Texas since the late 1960s specializing in water resources and related engineering and environmental disciplines. Today, I own and operate my consulting business Robert J. Brandes Consulting in Austin, Texas. For this current assignment, I have been retained by Somach Simmons & Dunn ("SSD") to assist and advise SSD in its representation of the State of Texas regarding legal matters related to the Rio Grande Compact.

The Appendix to this report contains my professional resume and a list of cases in which I have testified as an expert either by trial or deposition during the last four years. For the consulting services I provide to SSD, I am compensated at the rate of $250 per hour. My compensation is not dependent on the outcome of this litigation or the substance of my opinions.

2.0 ASSIGNMENT AND SUMMARY OF OBSERVATIONS AND OPINIONS

My assignments in this matter have been undertaken in response to specific requests from SSD. In this regard, I have provided information pertaining to elements of the Rio Grande Project prior to and after the early 1950s when development of significant groundwater pumping began in the Rincon and Mesilla basins of New Mexico, including evidence of the impacts of this groundwater pumping on hydrologic conditions and water use. I have summarized specific aspects of how the Rio Grande Project has been operated historically and what changes have occurred over time. Also, I have considered historical deliveries of Project water to users in New Mexico and Texas and how these deliveries have changed with the development of groundwater pumping.

Based on my investigations and analyses, I have made the following observations and arrived at the following opinions[1]:

1) One of the stated purposes of the Rio Grande Compact, as adopted by the States of Colorado, New Mexico and Texas in 1938, is to ensure a prescribed delivery of water from the Rio Grande to Elephant Butte Reservoir; hence, the Rio Grande Project, with its primary source of water supply being Elephant Butte Reservoir, is intricately tied to the Compact and dependent on the Compact for its water supply. The Rio Grande Project is the means by which Compact water from Elephant Butte Reservoir is apportioned among and delivered to users in New Mexico, Texas and Mexico. Hence, the relationship between the Compact and the Project is critical to being able to effectively supply water from the Rio Grande to users in southern New Mexico and western Texas, as well as Mexico.

2) In order to develop an understanding of Rio Grande Project operations, the U. S. National Resources Committee, through its Water Resources Committee, went to great detail in its 1938 Joint Investigation Report to identify the sources of and relationships among diversions of Rio Grande Project water and related activities based on 1930-1936 data. A primary goal of the Committee's analyses was to quantify the annual amount of reservoir water needed to support a normal irrigation supply within the Project area. The data and information

[1] The observations and opinions noted in the text of this report directly relate to the requests from SSD.

compiled and presented do provide a useful baseline for understanding the operation of the Rio Grande Project prior to adoption of the 1938 Rio Grande Compact.

3) Based on 1930-1936 data, the 1938 Joint Investigation determined that an amount of 773,000 acre-feet per year was the required release of water from Elephant Butte and Caballo Reservoirs to provide a normal supply for Rio Grande Project water users. In 1980, an amount equal to 763,800 acre-feet per year was established by the U. S. Bureau of Reclamation ("USBR") as the normal supply of reservoir water for the Project based on Project irrigation deliveries during 1946-1950 when supplies were considered to be normal. However, the Rio Grande Compact stipulates that 790,000 acre-feet per year of reservoir water represents an average normal supply for the Project. This quantity was a negotiated amount that evolved through discussions in 1938 among the Rio Grande Compact Engineering Advisors representing Colorado, New Mexico and Texas.

4) Rio Grande Project water delivered to users in New Mexico, Texas and Mexico historically has consisted of releases of stored water from Elephant Butte and Caballo Reservoirs, supplemented with return flows discharged back into the Rio Grande by upstream Project water users and limited arroyo inflows to the Rio Grande. Since the early 1900s, this concept of water use and reuse for the Rio Grande Project has allowed annual deliveries of Project water to exceed annual releases of stored water, with upstream users in New Mexico receiving relatively higher proportions of reservoir water and lower proportions of return flows than users in the El Paso Valley of Texas and Mexico. In this regard:

   - The 1938 Joint Investigation determined that 91.3% percent of the diversions in New Mexico originated as reservoir releases, whereas only 62.2% and 61.7% comprised the diversions by Texas and Mexico, respectively. Conversely, only 6.2% of New Mexico's diversions were comprised of drain return flows, whereas those for Texas and Mexico contained 34.9% and 35.0%, respectively.
   - In the 1980 USBR studies referred to above, the USBR determined, based on 1951-1978 Project operations data, that with the release of 763,800 acre-feet of stored water from Caballo Reservoir as a normal annual supply, the amount of water that could be apportioned for diversion from the Rio Grande by Project users was 931,840 acre-feet, or about 122 percent of the volume of reservoir water released. The additional 22% is almost entirely comprised of return flows from upstream drains.

5) Irrigated land within the Rio Grande Project area historically has been distributed approximately 57 percent in New Mexico and 43 percent in Texas, and allocations of Project water between the States generally have been in accordance with these proportions. However, this does not mean that the deliveries of stored water from Elephant Butte and Caballo Reservoirs to users in the two states have conformed precisely to these percentages because of the reliance on return flows to meet part of the water demands of downstream users in the lower Mesilla Valley and in the El Paso Valley in Texas.

6) Extensive groundwater withdrawals, particularly from relatively shallow aquifers with high groundwater levels such as those that existed along the Rio Grande below Elephant Butte Reservoir, can cause groundwater levels to decline, which in turn can cause normal

discharges of groundwater into rivers and streams, and into drains within irrigated areas, to be reduced. Eventually, with enough groundwater pumping, groundwater levels can fall below the elevation of surface water flowing in rivers and streams, and in the drains, thus causing the surface water to be depleted by seepage from the channels of rivers and streams, and from the drains, into the subsurface and the groundwater system. This streamflow depletion phenomenon has occurred in areas along the Rio Grande within New Mexico below Caballo Reservoir, causing Rio Grande flows to be less relative to the quantities of stored water released from Caballo Reservoir. One of the obvious effects of such increased surface water depletions in the Rio Grande basin below Caballo Reservoir has been to reduce flows in the river that otherwise would ultimately have reached Texas. Based on an analysis of historical data, since the development of significant groundwater pumping in New Mexico that began in the early 1950s, annual flows in the Rio Grande at El Paso have decreased an average of about 78,000 acre-feet per year.

7) Significant development of groundwater for providing supplemental supplies of irrigation water in the Rincon and Mesilla basins of New Mexico began with the onset of the severe drought of the 1950s when surface water supplies from the Rio Grande Project were limited. Since 1950, total annual groundwater withdrawals in these basins for irrigation and urban uses consistently have been above 100,000 acre-feet per year, with peak pumpage in recent dry years ranging generally from 300,000 to over 400,000 acre-feet per year. Of these amounts, annual groundwater withdrawals by the City of El Paso from its Canutillo well field in the lower Mesilla basin have ranged from a few thousand acre-feet up to around 25,000 acre-feet, with an average of about 19,000 acre-feet.

8) Numerous previous studies dating back 30 to 40 years, some of which were conducted by experts in New Mexico, have identified increased groundwater pumping for irrigation in the Rincon and Mesilla basins of New Mexico as a concern with regard to causing depletions of Project water flowing in the Rio Grande that otherwise would serve users in southern New Mexico and in the El Paso Valley of Texas. These studies noted that decreases in the Rio Grande flows at El Paso relative to releases from Caballo Reservoir began to occur in the early 1950s, around the same time that significant development of groundwater began in the Rincon and Mesilla basins of New Mexico.

9) Based on the significant changes evident in historical Rio Grande flows, streamflow depletions, drain discharges, and deliveries of Project water to users in southern New Mexico and in the El Paso Valley of Texas, there are strong empirical indications that the significant groundwater pumping that began in the 1950s in the Rincon and Mesilla basins caused these changes and effectively reduced the available supply of surface water from the Rio Grande below Caballo Reservoir.

10) The D1 and D2 Curves were developed by the USBR around 1980 to provide an organized structure for allocating Project water among the Elephant Butte Irrigation District ("EBID") in New Mexico, the El Paso County Water Improvement District No. 1 ("EPCWID") in Texas (together the "Districts"), and Mexico at the heading of its Acequia Madre. Having been developed based on actual historical Project data for the 1951-1978 period when groundwater development in the Rincon and Mesilla basins had already advanced to significant levels and was impacting Rio Grande flows, these relationships inherently

incorporate and reflect the effects of historical groundwater pumping in Rincon and Mesilla basins of New Mexico prior to 1978.

11) Historically, the volume of water in storage in Elephant Butte and Caballo Reservoirs immediately prior to and during each irrigation season has been the basis for determining annual allotments of Project water and annual releases of Project water from Caballo Reservoir. There are no apparent indications in the historical data that suggest this mechanism for determining annual releases from Caballo Reservoir has changed as a result of the development of significant groundwater pumping in the Rincon and Mesilla basins. There have been no apparent reductions in the releases of Project water from Caballo Reservoir that could have caused the observed reductions in the flows in the Rio Grande at El Paso since the onset of significant groundwater pumping in the early 1950s.

12) The 2008 Operating Agreement adopted by EBID, EPCWID and the USBR established official operating and allocation procedures for the Rio Grande Project and attempted to provide an equitable means for annually apportioning Project water among EBID, EPCWID and Mexico while recognizing the need to limit adverse impacts of New Mexico's groundwater pumping on deliveries of Project water to EPCWID and Mexico. Based on recent data, it is clear that the 2008 operating agreement has not fully offset the apparent effects of groundwater pumping on Project water diversions.

13) Accounting and reporting procedures for deliveries of Project water to and for diversions of Project water by EBID and EPCWID have changed since the Rio Grande Compact was adopted, and this fact, coupled with incomplete and/or unavailable data from the USBR and the Districts, limits the ability to effectively and consistently quantify actual historical deliveries of Project water to New Mexico, Texas and Mexico. Consequently, some delivery data have been estimated for purposes of this report.

3.0 RIO GRANDE BACKGROUND

The Rio Grande is an interstate and international river that originates in southern Colorado, runs generally north to south across New Mexico, enters Texas near the city of El Paso, Texas, and then defines the boundary between the United States and Mexico as it traverses to the Gulf of Mexico. The entire Rio Grande basin is depicted on the map in Figure 3.1. In total, the Rio Grande extends over a total distance of approximately 1,900 river miles, with about 1,255 river miles in Texas along the U.S.-Mexico border. Within the Rio Grande Project area from Elephant Butte Dam downstream to Fort Quitman, Texas, the Rio Grande covers approximately 210 river miles. Along its entire course, the Rio Grande provides a source of surface water that is used extensively to meet the needs of municipalities, industries, and agricultural irrigators, as well as to support various environmental uses. Numerous dams and reservoirs exist along the river primarily for water supply and flood control purposes; consequently, flows in much of the river are substantially controlled and regulated.

The Rio Grande Compact was agreed to in 1938 by the States of Colorado, New Mexico and Texas and the United States after many years of contentious relations involving the distribution and use

The Rio Grande Project ("Project") was created as a federally-supported irrigation project for the purpose of providing a dependable and equitable supply of water from the Rio Grande for agricultural interests along the Rio Grande in southern New Mexico and in the El Paso Valley of Texas. It was authorized pursuant to the Rio Grande Reclamation Project Act of 1905, and it included construction of Elephant Butte Dam and Reservoir on the Rio Grande near Truth or Consequences, New Mexico, to provide stored water for Project users. Project water was to be apportioned between irrigators in southern New Mexico and in the El Paso Valley of Texas in proportion to the irrigated acreage of Project lands within each State. Currently, there is a total of 159,650 acres authorized within the Project, with 90,640 acres within the EBID in New Mexico and 69,010 acres within the EPCWID in Texas [3]. These acreages translate to approximately a 57/43 split for the distribution of Project water between New Mexico and Texas users.

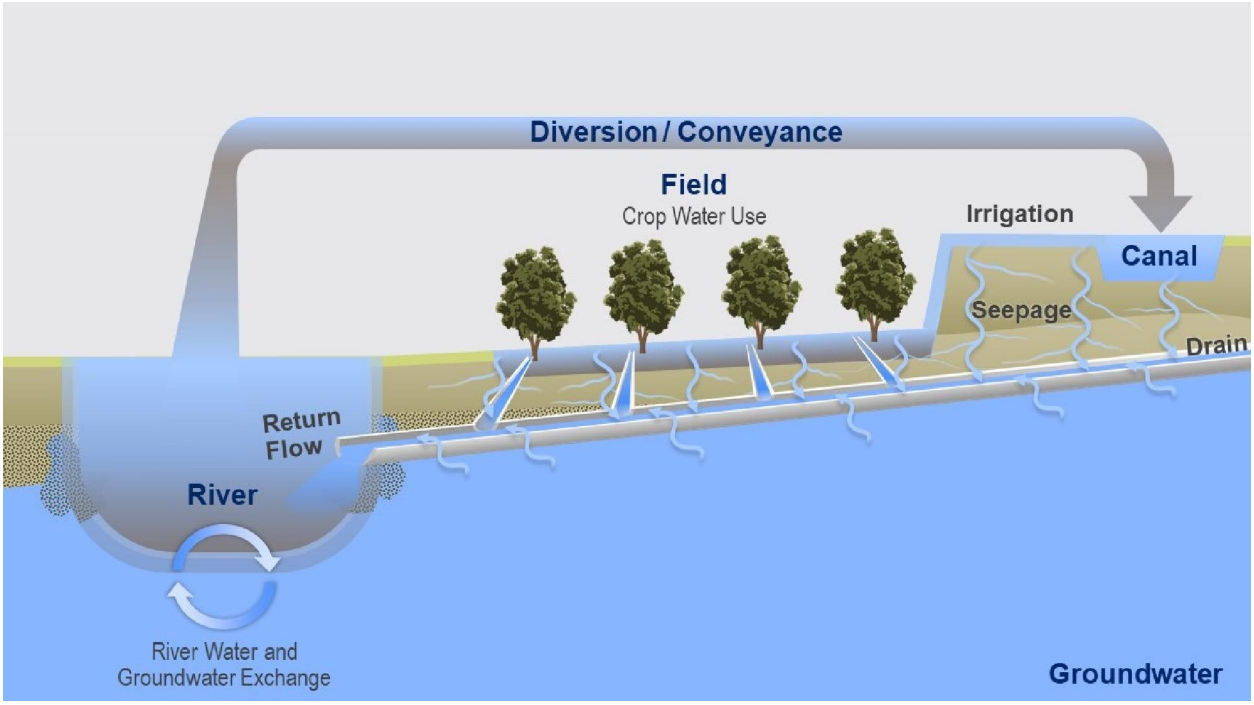
Today, the Project includes Elephant Butte Dam and Reservoir, Caballo Dam and Reservoir located immediately below Elephant Butte Dam, a hydropower plant at Elephant Butte Dam, three diversion dams on the Rio Grande in New Mexico (Percha, Leasburg, and Mesilla), two diversion dams on the Rio Grande in Texas (American and International, both owned and operated by the International Boundary and Water Commission), and an extensive system of canals, laterals, waste ways, and drainage ways that support irrigation operations in both Districts. The major dams and reservoirs and the diversion dams included in the Project are identified on the map of the region in Figure 3.2. Irrigated areas for EBID and EPCWID also are identified.

Depending on the quantity of water stored in Elephant Butte and Caballo Reservoirs before the beginning of each irrigation season, which typically begins during February, and the inflows to the reservoirs anticipated during the irrigation season, Project water is apportioned to users in New Mexico and Texas and to Mexico. Releases of stored water are made during the irrigation season in response to irrigation demands, and Project water consisting in varying amounts of released stored water, return flows from upstream irrigation operations, and occasional arroyo flows is diverted by EBID and EPCWID into their respective canal systems and by Mexico into its Acequia Madre. The return flows consist of excess irrigation tailwater and groundwater seepage from irrigated fields that are collected in drains that convey these return flows to the Rio Grande; hence, the proportion of return flows in the river increases in the downstream direction relative to stored water from the reservoirs, with Project water users in the lower Mesilla basin and in the El Paso Valley of Texas having to divert significant quantities of return flows. A portion of the Project water delivered to the El Paso Valley also is diverted by the City of El Paso for municipal use under agreements with EPCWID and private land owners within EPCWID that assign their Project water allotments for specific land parcels to the City. Excess canal flows and drainage water (return flows) from Project lands within the EPCWID also provide a supplemental water supply for approximately 18,000 acres of land within the Hudspeth County Conservation and Reclamation District No. 1 below the EPCWID down to Fort Quitman, Texas.

With the Rio Grande Compact having been adopted by the States in 1938 to ensure a prescribed delivery of water from the Rio Grande to Elephant Butte Reservoir, it is apparent that the Rio Grande Project is intricately tied to the Compact and dependent on the Compact for its water supply. The Rio Grande Project, in turn, is the means by which Compact water from Elephant Butte Reservoir is apportioned between and delivered to New Mexico, Texas, and Mexico. Hence, the relationship between the Compact and the Project is critical to being able to effectively supply water from the Rio Grande to users in southern New Mexico and the El Paso Valley of Texas, as

determined that approximately 35 percent of the total supply of Project water delivered to Texas in the El Paso Valley was from upstream return flows, with the majority of the balance originating as releases from Caballo Reservoir. Conversely, since water for Project users in New Mexico was diverted from the Rio Grande farther upstream, i.e. above the river outfalls of most drains, only about six percent of New Mexico's total deliveries originated from return flows. Subsequently, in the early 1980s, the USBR developed the D1 and D2 allocation curves for the Rio Grande Project based on 1951-1978 operating data, and under normal supply conditions for the Project, these curves provided for 122 percent of the annual Caballo Reservoir release to be diverted from the Rio Grande for Project users [12]. This additional 22 percent was almost entirely from return flows discharged into the Rio Grande from drains.

Figure 4.1 Schematic of Rio Grande and Groundwater System Interaction Prior to Development of Groundwater Pumping in Rincon and Mesilla Basins



With the extensive development of groundwater in the Rincon and Mesilla basins of New Mexico that began during the early 1950s, particularly in the relatively shallow aquifers with generally high groundwater levels such as those along the Rio Grande, groundwater levels began to fluctuate and decline in some areas, which in turn caused discharges of groundwater into the drains, and directly into the river, to be reduced [24,25]. Eventually, with enough groundwater pumping, the groundwater gradient in many areas reversed, with reductions in the groundwater inflows to the drains and into the river. Hutchison demonstrates this phenomenon with his groundwater model for the historical conditions base case [25,29,30]. This condition is illustrated by the diagram in Figure 4.2. As shown, the level of the groundwater is below the bottom of the river channel and the drain, and water flowing in the river and in the drain moves toward and into the groundwater system, rather than the other way around as it was prior to the initiation of groundwater pumping. The discharge of return flow from the drain into the river is substantially curtailed, if not reduced to zero, thereby also reducing the flow in the river.

just upstream of El Paso. The inflows to the Rio Grande from this drain, like that from many others upstream in the Rincon and Mesilla basins, are an important source of Project water for downstream users, in this case those in Texas. The use of these return flows to meet Project water demands has been an integral component of the Rio Grande Project since the early 1900s [19], and without these return flows, the water budget for the Project is significantly altered.

As shown on the graph, the historical data exhibit a drastic change of slope beginning during the early 1950s and then continuing with a flatter slope through 1995. This flattening of the slope of the historical data compared to the straight-line extension of the pre-1950 data trend (red dashed line) indicates that the flow discharging from the drain was significantly reduced – by an average of approximately 39,000 acre-feet per year from 1951 through 1995. While some of this flow reduction may be attributed to improved irrigation efficiency, it more likely than not was due to the loss of groundwater inflows to the drain that resulted from the lowering of groundwater levels caused by irrigation pumping that began in the early 1950s. With lower groundwater levels, any irrigation tailwater or excess irrigation water flowing in the drain seeped into the underlying soil thus reducing or eliminating flows in the drain and subsequent discharges of return flows into the Rio Grande. Hutchison illustrates this with his groundwater model [29,30].

5.2 Rio Grande Flows at El Paso

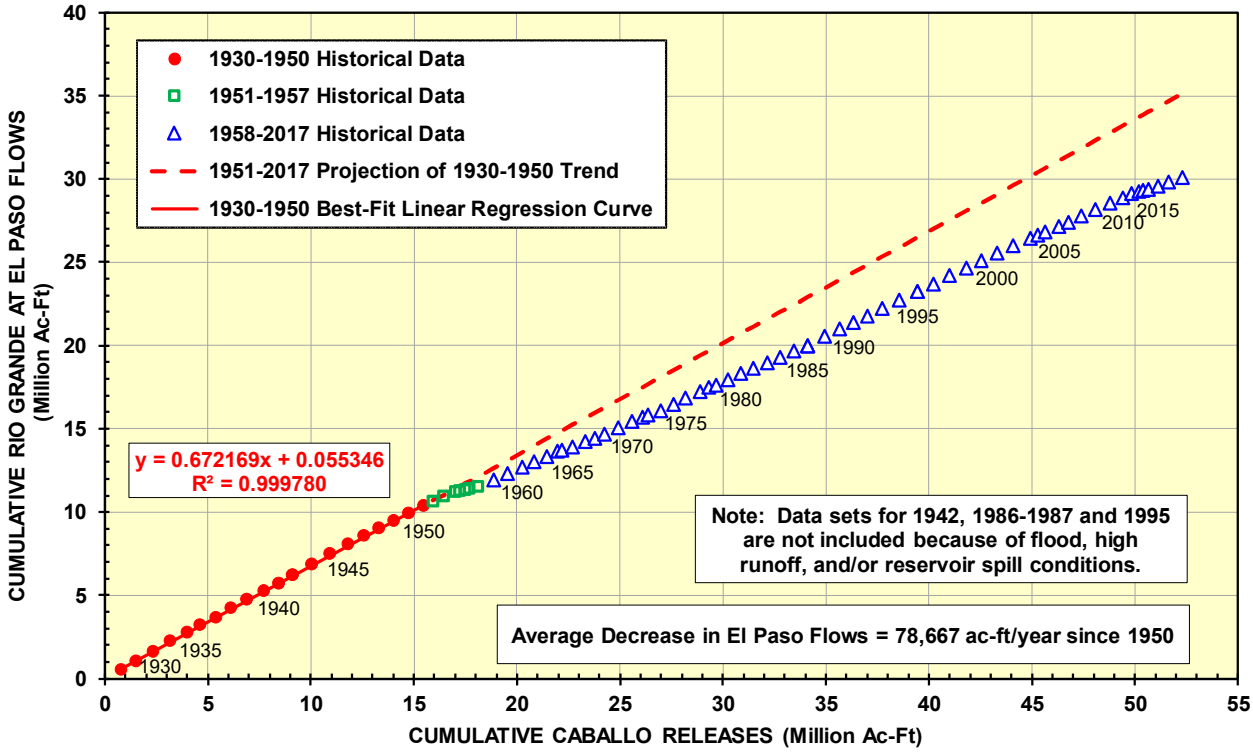
As discussed in Subsection 4.3, reductions in the flow of the Rio Grande at El Paso coinciding with the development of groundwater pumping in the Rincon and Mesilla basins have been of concern for many years. While there is a multitude of approaches for examining these changes ranging from simple time-series graphs to complex modeling procedures, the double-mass graphical method provides one of the most useful means for analyzing historical data to gain insight into understanding the causes of changes in hydrologic phenomena. This technique involves graphical presentations of time series data expressed as cumulative values of a dependent variable plotted against the cumulative values of an independent variable, with the resulting curve beginning on a specified date and proceeding in time to an ending date.

This double-mass approach is applied to historical flow data for the Rio Grande at El Paso on the graph in Figure 5.4, where the historical cumulative flows in the Rio Grande at El Paso (dependent variable), beginning in 1930, are plotted against the corresponding cumulative releases from Caballo Reservoir (independent variable) [15,21,27]. This is the same form of graph that was previously discussed in Subsection 4.3 with regard to the 1982 report [6] for examining similar trends. As shown in Figure 5.4, the historical data are plotted in three groups corresponding to three different time periods; one for 1930 through 1950 before the 1950s severe drought, a second covering the 1950s drought from 1951 through 1957 when significant groundwater development began in the Rincon and Mesilla basins, and a third for 1958 through 2017 after the 1950s drought as groundwater pumping continued to develop.

The curve depicted by the combined data sets representing the entire 1930-2017 period exhibits a distinct change in slope beginning during the early 1950s (green squares), with the curve following a generally uniform but flatter slope after the 1950s (blue triangles). This change in the slope of the historical data curve during the 1950s could be partially a result of the drought of the 1950s when releases from Caballo Reservoir were reduced because of the limited supply of stored water in Elephant Butte Reservoir and when channel losses along the Rio Grande may have been more

pronounced under low flow conditions. However, as discussed previously, the early 1950s also is the timeframe when significant groundwater development began in the Rincon and Mesilla basins to provide supplemental irrigation water in lieu of limited Project surface water for New Mexico farmers. The fact that the historical data curve continues after the drought of the 1950s (blue triangles) at a relatively uniform slope that is flatter than the curve prior to the 1950's (red dots) indicates that there was less river flow at El Paso for the same amount of water released from Caballo Reservoir. This illustration directly supports the conclusion that groundwater pumping along the Rio Grande in the Rincon and Mesilla basins was the principal cause of the reduced flows in the river at El Paso relative to releases from Caballo Reservoir. Hutchison [29,30] illustrates this same phenomenon with his groundwater model by reducing groundwater pumping in the Rincon and Mesilla basins from historical levels.

Figure 5.4 Double-Mass Plot of Cumulative Rio Grande Flows at El Paso versus Cumulative Releases from Caballo Reservoir Beginning in 1930



The deviation of the historical flows curve after 1950 (blue triangles) from the extension of the curve before the 1950s (dashed red line) averages 78,667 acre-feet per year, which is equivalent to a total reduction in the flow of the Rio Grande at El Paso of about 5,000,000 acre-feet for the period from 1951 through 2017, excluding the flood years of 1986-1987 and 1995. Based on this demonstration, it is more likely than not that groundwater pumping in New Mexico within the Rincon and Mesilla basins that began in the early 1950s and continues today played a major role in reducing flows in the Rio Grande at El Paso from what they were prior to the 1950s without groundwater pumping for the same annual quantities of water released from Caballo Reservoir. In essence, the extension of the 1930-1950 curve represents the "no compact violation" condition.

At the time the D1 and D2 Curves were developed, irrigated acreage in the Rio Grande Project included about 155,000 acres, and a full or normal supply of irrigation water was determined by the USBR based on 1946-1950 Project irrigation data to be 3.024 acre-feet of water per acre of irrigated land [12]. During the 1946-1950 period, hydrologic conditions were such that the annual releases from Caballo Reservoir ranged between 712,157 and 763,668 acre-feet per year, with the average equal to approximately 732,000 acre-feet per year [15]. Apparently, the USBR considered this series of annual reservoir releases to be generally consistent with the 790,000 acre-feet per year stipulated in the Compact as the normal annual supply of stored water from the reservoirs; thus, the associated average annual irrigation duty of 3.024 acre-feet of water per acre was adopted by the USBR as the normal supply of irrigation water. For 155,000 acres of irrigated land within the Project area, this irrigation duty equates to 468,720 acre-feet of water delivered to farms in Texas and New Mexico (3.024 x 155,000). Combined with the full supply authorized by the Convention of 1906 [2] for delivery to Mexico of 60,000 acre-feet per year, the total quantity of water to be delivered under normal supply conditions is equal to 528,720 acre-feet per year [12], of which 11.348 percent is Mexico's (60,000/528,720 = 11.348%).

To deliver 528,720 acre-feet per year of Project water during an irrigation season, the D1 Curve indicates that approximately 763,800 acre-feet of water must be released from the reservoirs as a normal supply. Again, this release amount is somewhat different from the 790,000 acre-feet per year stipulated in the Compact, but it was based on actual Project operations data for the 1951-1978 period and apparently was considered by the USBR to be generally consistent with the Compact. With this volume of reservoir release, the D2 Curve indicates that the amount of water apportioned for diversion from the Rio Grande into the main canals for irrigation in Texas and New Mexico and for delivery to Mexico is approximately 931,840 acre-feet. Of this amount, 60,000 acre-feet are allocated to Mexico and the balance of 871,840 acre-feet is distributed to EBID in New Mexico and to EPCWID in Texas based on the approximate 57/43 split of irrigated Project acreage (494,980 and 376,860 acre-feet per year, respectively). As noted previously, the increase in the amount of Project water diverted from the Rio Grande above the amount of stored water released from the reservoirs (931,840 - 763,800 = 168,040 acre-feet per year or 22 percent) is comprised of primarily return flows from drains that are discharged into the Rio Grande upstream of the main canals where diversions are made.

For conditions when the volume of water stored in Elephant Butte and Caballo Reservoirs does not support a normal Project water supply, the above D1 and D2 equations can be applied starting with the known value of Release from Storage (based on available usable water in storage at the beginning of an irrigation season) and then calculating the Total Delivery to U.S. Farms & Mexico and the Total U.S. & Mexico Canal Diversions. Mexico's allocation is calculated as 11.348 percent of the Total Delivery to U.S. Farms & Mexico. Allocations to EBID and EPCWID are based on their relative acreages of irrigated land within the Project area, approximately 57% and 43%, respectively.

The total diversion of 931,840 acre-feet per year as determined above based on the D2 Curve for the normal supply of Project water at the main canal headgates is somewhat greater than the comparable amount of 829,774 acre-feet per year determined by the 1938 Joint Investigation (see Row 24 of Column 1 in Table 6.3). One reason is that the JIR value was based on total Project acreage of 145,000 acres, whereas the D2 amount is based on 155,000 acres. Proportionally adjusting for this difference in acreage produces 887,000 acre-feet per year for the JIR value. The

procedures for determining annual allocations of Project water among EBID, EPCWID and Mexico, for releasing water from storage, for ordering and making deliveries of Project water, and for accounting and reporting. However, it is significant to note that the Agreement also attempted to address, at least partially, the issue of New Mexico's groundwater pumping impacts by including provisions intended to limit these effects on flows in the Rio Grande and deliveries to Texas users. As with prior operating practices, the D2 Curve is stipulated in the Agreement as the basis for determining the total amount of Project water available for diversion from the Rio Grande, with Mexico's share determined in the same manner as before the Agreement and with the balance divided among the two Districts based on irrigated acreage [18]. However, the Agreement deviates from prior operating practices with stipulated adjustments to diversions for EBID and EPCWID to account for changes in annual Project performance, defined as "changes in the actual amount of water available for diversion compared to the estimated available diversion based on the D2 Curve" [18]. As stated in the USBR report [18]:

> *The OA represents Project performance using the diversion ratio, which is calculated as the ratio of total annual Project allocation charges to total annual Project release. The diversion ratio adjustment provision of the OA allows for adjustment of the annual Project allocations to EBID and EPCWID so as to maintain district diversion allocations to EPCWID at a level consistent with historical Project performance as represented by the D-2 Curve. ……The diversion ratio adjustment provision of the OA therefore mitigates potential negative effects of changes in Project performance, which result predominately from the actions of individual landowners within EBID, by ensuring that Project allocations and deliveries to EPCWID remain consistent with historical Project performance.*

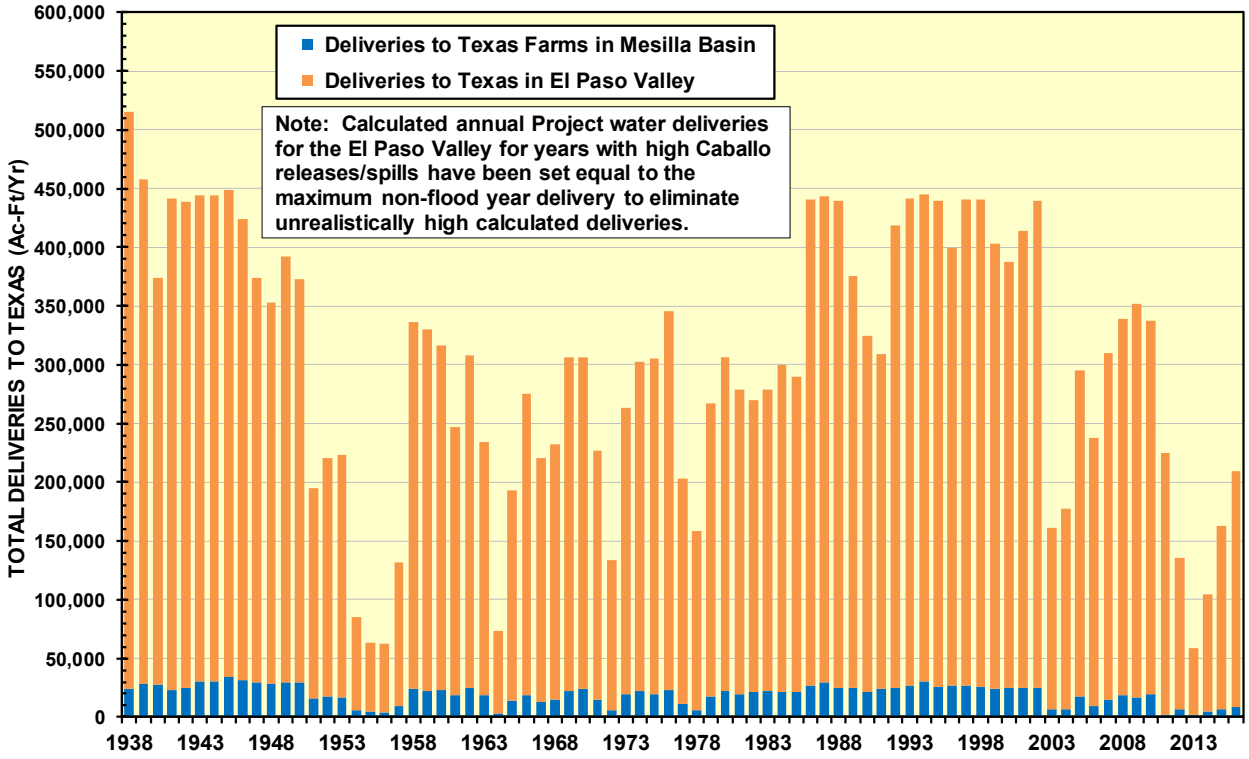
Notwithstanding the process embedded in the Operating Agreement for attempting to mitigate for the effects of groundwater pumping in New Mexico on deliveries to Texas, the fact remains that groundwater pumping along the Rio Grande in the Rincon and Mesilla basins of New Mexico is not limited and continues at significant levels, adversely affecting flows in the river and diversions for Project water users in Texas. This is evident by the data presented on the graphs in Figures 4.7, 5.4 and 5.6 where the post-2007 data exhibit little change from conditions prior to adoption of the Agreement.

6.5 Effect of Groundwater Pumping on Reservoir Releases

As discussed in Subsection 4.2, the development and use of groundwater in the Rincon and Mesilla basins began in the early 1950s and has continued to increase, accompanied by reductions in the flows of the Rio Grande at El Paso and in the drain discharges to the Rio Grande as discussed and illustrated in Section 5.0. It is significant to note, however, that the operation of Elephant Butte and Caballo Reservoirs and the annual allocation of Project water and the associated releases from Caballo do not appear to have noticeably changed as a result of the groundwater pumping. The graph in Figure 6.4 presents a plot of annual reservoir releases from Caballo Reservoir versus the corresponding maximum combined storage in Caballo and Elephant Butte Reservoirs prior to and during the irrigation season. The storage data on this plot are limited to years when the total storage was less than 1,500,000 acre-feet because with storage amounts greater than this, annual releases have been somewhat erratic due to high river flows and releases of flood water. Data plotted on the graph are segregated into two time periods; one for 1940-1955 before the effects of

the El Paso Valley. These annual values are plotted on the bar chart in Figure 7.4 along with the corresponding annual deliveries to Texas farms in the Mesilla basin as developed by Montgomery.

Figure 7.4 Total Historical Deliveries of Project Water to Texas in Mesilla Basin and El Paso Valley



As noted, the calculated values for the El Paso Valley deliveries for years with abnormally high releases from Caballo Reservoir have been adjusted by setting them equal to the highest annual delivery value for non-flood years, which turns out to be in 1997. A value of 800,000 acre-feet per year has been used as the threshold reservoir release value since this is slightly greater than the normal supply release of 790,000 acre-feet per year stipulated in the Compact. This adjustment eliminates unrealistically high values of the calculated El Paso Valley deliveries due solely to high river flows at El Paso that result from high reservoir releases or spills. Even with these adjustments, some above-normal flow conditions still are likely reflected in the annual delivery values as a result of arroyo inflows that entered the river below Caballo Dam during local rainfall events. As plotted in Figure 7.4, the average of the 1938-2016 total historical deliveries to Texas is 302,165 acre-feet/year, with an average of 19,479 acre-feet/year for the deliveries to farms in the Mesilla basin and an average of 282,687 acre-feet/year for the El Paso Valley deliveries.

7.4 Deliveries of Project Water to Texas Without Groundwater Pumping

The double-mass analysis approach has been applied to the historical total Project water deliveries to Texas to assess apparent changes in historical delivery patterns relative to releases from Caballo Reservoir, particularly changes that may have occurred after significant groundwater pumping began in the Rincon and Mesilla Valleys in the early 1950s. The graph in Figure 7.5 presents the double-mass curves based on the 1938-2016 total historical delivery data for Texas plotted on the graph in Figure 7.4. As noted on the graph, the historical data for the total annual deliveries to

IN THE SUPREME COURT OF THE UNITED STATES
BEFORE THE OFFICE OF THE SPECIAL MASTER
HON. MICHAEL J. MELLOY

STATE OF TEXAS	)	
	)	
Plaintiff,	)	
	)	Original Action Case
VS.	)	No. 220141
	)	(Original 141)
STATE OF NEW MEXICO,	)	
and STATE OF COLORADO,	)	
	)	
Defendants.	)	

****

ORAL DEPOSITION OF
ROBERT BRANDES, Ph.D., P.E.
SEPTEMBER 24, 2019
VOLUME 1

****

ORAL DEPOSITION of ROBERT BRANDES, Ph.D., P.E., produced as a witness at the instance of the Defendant State of New Mexico, and duly sworn, was taken in the above-styled and numbered cause on September 24, 2019, from 9:07 a.m. to 4:13 p.m., before Heather L. Garza, CSR, RPR, in and for the State of Texas, recorded by machine shorthand, at the offices of SOMACH SIMMONS & DUNN, 500 Capitol Mall, Suite 1000, Sacramento, California, pursuant to the Federal Rules of Civil Procedure and the provisions stated on the record or attached hereto; that the deposition shall be read and signed.

drive very far is not pleasant.

A. It's impossible.

Q. Yeah.

A. Exactly.

Q. I'd like to touch very briefly on your education. I see that you got your master's in civil engineering from UT back in 1968?

A. Correct.

Q. Do you recall what the nature of your thesis was at that time?

A. It was hydraulics, some project that we did with Texas Highway Department on culvert hydraulics, I think.

Q. And the -- do you recall the nature of the dissertation you did for your PhD in water resources?

A. Yes. It was estuary modelling for gulf coast type estuaries, modelling currents and -- and salinity.

Q. Now, I understand from reviewing your resume, which is certainly an impressive one, that you say that you're especially familiar with the development and application of computerized simulation techniques for analyzing water-related phenomena across various types of water systems?

A. Yes.

Q. Is that what would colloquially be referred to as modelling or is it distinct from that?

A. I think it's modelling.

Q. Is that how you characterize what you did in this case or would you characterize what you did in this case as something different?

A. I did some modelling in this case. Majority of the work I did was more hydrology oriented and water-type studies.

Q. Which aspects of the report that you did would you say relied specifically on modelling versus another type of analysis?

A. None of the -- my modelling work is reported in the report.

Q. Okay. Did you do the modelling work and just decide not to use it in the report?

A. Basically that was what was done.

Q. Do you recall why you decided not to use the modelling work as part of your report?

A. When I was originally hired, it was to develop a -- a model of the reservoirs, Elephant Butte and Caballo, and their -- their operations, operating rules, things of that sort, with the idea that we thought we would need a model of those reservoirs down the road, and as it turns out, the way things ended

up, we did not need that model so we have not used it or reported on it.

Q. Okay. Well, let's get to why we're all here today, which is to discuss the expert report that you prepared here. So we can make it official for the record and so you can follow along with me on paper rather than just having to hear me ask, I'm going to ask this be marked as Brandes Exhibit 1?

(Exhibit No. 1 was marked.)

Q. (BY MR. ROMAN) This is a copy of your expert report as we received it in disclosures from the State of Texas.

MR. ROMAN: Does anybody here, other than Stuart, need a copy?

MR. WALLACE: Yeah.

MR. ROMAN: Nobody else?

MR. RICH: If you've got an extra.

MR. ROMAN: I've got one, Chris. I come prepared.

Q. (BY MR. ROMAN) I'm certainly not going to have you go through it page by page right now, but does this appear to be a full and complete copy of the primary expert report that you submitted in this matter, understanding that you also submitted separately background calculations and data, as well

understanding -- well, let me go back to my first question, because you asked what I meant by asking what in response to irrigation demands means to you. I'm trying to understand, as you wrote that project water is released in accordance with irrigation demands, what you understand that phrase to mean?

A. I think I just answered that. It means --

Q. Because --

A. -- in response to orders from the District, project water is released.

Q. Does it mean in your understanding that the water released has to be used for irrigation purposes?

A. No.

Q. In your understanding, how does the provision that water be released in accordance with irrigation demands govern release of project water for municipal purposes such as project water diverted by the City of El Paso under agreements with EP1 or private landowners in EP1?

A. Well, water used by El Paso is -- is quantified based on irrigated acreage that they have some control over, contractually or whatever, and that's how they're entitled to use project water for municipal purposes.

Q. So if I understand you correctly, it's your

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	)	(Original 141)
STATE OF NEW MEXICO,	)	
and STATE OF COLORADO,	)	
	)	
Defendants.	)	

THE STATE OF TEXAS :
COUNTY OF HARRIS :

I, HEATHER L. GARZA, a Certified Shorthand Reporter in and for the State of Texas, do hereby certify that the facts as stated by me in the caption hereto are true; that the above and foregoing answers of the witness, ROBERT BRANDES, Ph.D., P.E., to the interrogatories as indicated were made before me by the said witness after being first duly sworn to testify the truth, and same were reduced to typewriting under my direction; that the above and foregoing deposition as set forth in typewriting is a full, true, and correct transcript of the proceedings had at the time of taking of said deposition.

I further certify that I am not, in any capacity, a regular employee of the party in whose

behalf this deposition is taken, nor in the regular employ of this attorney; and I certify that I am not interested in the cause, nor of kin or counsel to either of the parties.

That the amount of time used by each party at the deposition is as follows:

MR. ROMAN - 04:28:43
MR. SOMACH - 00:00:00
MR. WALLACE - 00:00:00
MR. MACFARLANE - 00:00:00
MS. BARNCASTLE - 00:00:00
MS. STEVENSON - 00:00:00

GIVEN UNDER MY HAND AND SEAL OF OFFICE, on this, the 10th day of October, 2019.

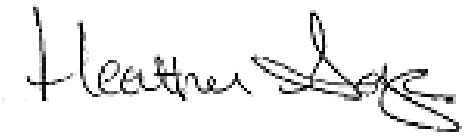

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Exhibit 15

JRP HISTORICAL CONSULTING, LLC

May 31, 2019

EXPERT REPORT OF:
Scott A. Miltenberger, Ph.D.

In the matter of:

No. 141, Original
In the Supreme Court of the United States
State of Texas v. State of New Mexico and State of Colorado

Prepared for:

Somach Simmons & Dunn
500 Capitol Mall, Suite 1000
Sacramento, CA 95814

Prepared by:

SCOTT A. MILTENBERGER
JRP HISTORICAL CONSULTING, LLC
2850 SPAFFORD STREET, DAVIS CA 95618

Introduction

I, Scott A. Miltenberger, Ph.D., am a partner at JRP Historical Consulting, LLC (JRP), located at 2850 Spafford Street, Davis, California. This expert report was prepared by me for Somach Simmons & Dunn, attorneys representing the State of Texas before the Supreme Court of the United States in *State of Texas v. State of New Mexico and State of Colorado*, No. 141, Original. I have been asked to provide opinions on the following questions regarding the Rio Grande Compact of 1938 and its historical interpretation:

1. What was the purpose of the 1938 Rio Grande Compact?
2. Did the amount of water apportioned to Texas by the 1938 Rio Grande Compact include water to address water quality concerns on Rio Grande Project lands in Texas?
3. What comprised the water supply for the Rio Grande Project, circa 1938?
4. What did delivery of water by the State of New Mexico to San Marcial, under the terms of the 1938 Rio Grande Compact, constitute?
5. Did the 1938 Rio Grande Compact limit the uses to which water in the Upper Rio Grande Basin could be put?
6. Did the Special Master fairly describe the background history leading to the 1938 Rio Grande Compact on pages 31 through 187 and 203 through 209 of the *First Interim Report of the Special Master*, dated February 9, 2017?

In addressing these questions, I have relied upon my education and nearly 13 years of experience as a professional historian, primarily of western water and land use, as well as my review and analysis of archival documents, published sources, and academic monographs. Together with my former business partner (now retired) Mr. Stephen Wee and JRP staff under my direction (all of whom possess graduate degrees in history), I undertook research and collected historical material from a number of federal, state, and local repositories. These include: the National Archives in Washington, DC, at College Park, Maryland, at Denver, Colorado, and 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 Archives in Santa Fe; the University of New Mexico 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. I also examined documents produced by the states of Texas, Colorado, and New Mexico, and the United States in this action as well as the materials appended to the *First Interim Report of the Special Master*.

The Supreme Court granted leave to Texas to proceed with its suit in November, and appointed a special master, attorney Charles Warren, to take testimony in May 1936. Between November 1936 when Warren opened hearings and March 1937 when hearings concluded, nearly 40 hearings were held in Albuquerque, New Mexico, and El Paso, Texas, and in excess of 3,000 pages of evidence – including more than 260 exhibits, maps, charts, graphs, and witness testimony – were produced. Warren further personally inspected several hundred miles of the Rio Grande and the various irrigation and drainage system that served lands in New Mexico and Texas.[35]

Despite all of this, when the hearings ended the special master could not see a clear resolution. In his *Ad Interim Report* to the Supreme Court in March 1937, Warren indicated that he was "of opinion that findings of fact by me based on the evidence in its present shape would be unsatisfactory and might not result in an equitable adjustment of the situation." Essential legal issues (such as the absence of the US and Colorado as parties to the litigation) aside, the special master cited incomplete records and partial analyses of flow depletion and salinity levels as constituting an insufficient basis for findings of fact. Aware that the federal government through the National Resources Committee (NRC) was "investigating the whole problem of water supply and distribution in the Upper Rio Grande region," and at the request by counsel representing Texas, New Mexico, and MRGCD, to hold "further proceedings…in abeyance until the first day of October 1937," Warren recommended postponement of the case until January 1938. The high court approved the recommendation in April.[36]

The National Resources Committee referenced by Warren was a special working group of government officials and consultants within the Roosevelt Administration that aimed to foster development of the nation's natural resources through planned regional public works programs. In September 1935, a month prior to Texas filing suit against New Mexico and MRGCD, "spurred by the need for prompt action to avoid uncoordinated development of water utilization projects" in the Upper Rio Grande Basin, the group appointed a Board of Review to study the various water use problems and proposed projects in the basin. The board readily identified the potential for

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Notes, Reports re: Texas vs. New Mexico [hereafter Box 4], Series 1: Materials re: cases, Charles Warren Papers 1885-1954 [hereafter CWP], Manuscripts Unit, Harvard Law School Library, Historical and Special Collections, Cambridge, Massachusetts [hereafter HLS HSC]; and *Ad Interim Report of the Special Master*, received Mar. 26, 1937, 4-6. ff. RG 267, Entry 26, TX v NM #10, Box 401, Entry 26, RG 267, NAB.

[35] *Ad Interim Report of the Special Master*, received Mar. 26, 1937, 1. ff. RG 267, Entry 26, TX v NM #10, Box 401, Entry 26, RG 267, NAB.

[36] Special Master to Richard F. Burges, Esquire, March 26, 1937. ff. Correspondence re: Texas vs. New Mexico/March, 1937, Box 4, CWP, HLS HSC; *Ad Interim Report of the Special Master*, received Mar. 26, 1937, 5-13; and *Supreme Court of the United States, October Term 1936, No. 10 Original, State of Texas vs. State of New Mexico, et al., Final Report of the Special Master*, filed Sep. 25, 1939, 4. ff. RG 267, Entry 26, TX v NM #10, Box 401, Entry 26, RG 267, NAB.

and of the release from Elephant Butte Reservoir, to the end that the records at these stations may be correlated." The final draft also incorporated the language suggested by the engineers for paragraph 15 as Article VIII.[92]

The state compact commissioners, Clayton, Hinderlider, and McClure, soon after forwarded the document to their respective governors, and in the case of Harper, to the secretary of the interior. In his November 1938 transmittal letter to Governor W. Lee O'Daniel, Clayton expressed his opinion that the "compact represents a fair and equitable settlement of the controversies that have raged almost continuously for over forty years between the three States." "As far as Texas is concerned," the commissioner wrote, "it in effect prevents further encroachments on the waters of the Rio Grande by the upper basin States.""[93]

Letters by Hinderlider, McClure, and Harper all evoked the same optimism, even as each touted the individual benefits of the compact of their respective states or for the United States. Hinderlider "believed" that the "interstate River Compact or Agreement…equitably allocates the waters of the Rio Grande Basin originating above Fort Quitman, Texas, between the States of Colorado, New Mexico, and Texas." For Colorado specifically, he informed Governor Teller Ammons a few days after Clayton wrote O'Daniel, the "permanent compact…fully protects present and future uses of waters in the San Luis Valley, and the San Juan Basin in Colorado against exportations of water out of that basin for use in the Rio Grande Basin in New Mexico, except upon the conditions stated in the Compact." That protection further extended, according to Hinderlider, to "the rights of the water users under federal reclamation projects in New Mexico and Texas," as well as to "Indian tribes, and to the Republic of Mexico under existing treaty obligations."[94]

McClure used almost identical language to Hinderlider in his letter to New Mexico Governor John E. Miles in January 1939. "The Compact," he wrote, "fully protects present and future uses of the waters of the Rio Grande stream system in New Mexico." He envisioned an end to the controversies over the use of the Rio Grande waters with the compact, "particularly the suit

[92] Proceedings of the Meeting of the Rio Grande Compact Commission...March 3rd to March 18th, inc., 1938, 33-37, and Appendix No. 11, 78 and 80. ff. 032.1, Box No. 936, Entry 7, RG 115, NARA Denver.
[93] Frank B. Clayton to Hon. W. Lee O'Daniel, November 16, 1938, 1-4. [1938], Box 2F467, RGCC-FBCP, UTA.
[94] M.C. Hinderlider, Commissioner for Colorado, to His Excellency, Governor Teller Ammons, State Capitol, Denver, Colorado, November 15, 1938, in *Rio Grande Basin Compact* [and Analysis Thereof by M.C. Hinderlider in Address to Colorado Legislature and to Gov. Teller Ammons on Nov. 15-1938], 5-9. ff. 58 Rio Grande Basin Compact, Box 44-70, MSS 312, MCHC 1897-1987, HC.

of this water was land in Hudspeth County. Nevertheless, in calculating an equitable quantity for Texas that made possible development of Colorado's San Luis Valley, Meeker included the water received by land downstream of the project along with the water demands of lands within the Rio Grande Project and the obligations to Mexico under the 1906 treaty, even though the water diverted by Hudspeth landowners was "junior in every respect."[200]

Harwell likewise sought to condition the rights of landowners downstream of the project before the commission, although he did not dismiss the fact that those in Hudspeth obtained water via the project and would in the future. He explained that "the Hudspeth District is entitled to no more water than the surplus waters which may exist at the Tornillo canal." Put another way, "Hudspeth District was entitled to receive no more water from the project than this unavoidable waste which is bound to occur through this 150 miles of operation between the dam [Elephant Butte] and the point of lowest delivery." Any additional water that Hudspeth landowners could obtain, according to Harwell, would be "by their own pumping operations for drainage…putting to use water which would otherwise be put to use in the stream bed by them or anyone else interested." He believed that with increased efficiencies in water use by the project and its completion to serve the full irrigable acres within the project, future water use downstream of the project would be "limited to… [that] which can be called legitimately unavoidable waste."[201]

The temporary compact of 1929 did not specifically address the relative water needs of the three states, save to endorse federal construction of a "closed basin drain" and "State line reservoir" in Colorado. Nevertheless, as noted above, Article XII acknowledged the importance of Elephant Butte Reservoir to lands below, lands that as the federal project was operated included lands in Hudspeth, and attempted to safeguard the reservoir's water supply:

> New Mexico agrees with Texas with the understanding that prior vested rights above and below Elephant Butte Reservoir shall never be impaired hereby, that she will not cause or suffer the water supply of the Elephant Butte Reservoir to be impaired by new or increased diversions or storage within the limits of New Mexico unless and until such

[200] Proceedings of Rio Grande Compact Commission…December 19-20-21, 17, 37-38, 40-41, and 43. Folder Rio Grande Compact Commission Records, 1924-1941, 1970, Richard F. Burges Papers, Proceedings of Rio Grande Compact Conference Held Dec. 19-20-21, 1928 at Santa Fe, N.M., Box 2F471, RGCCR, 1924-1941, 1970, UTA.

[201] Proceedings of Rio Grande Compact Commission…December 19-20-21, 1928, 52-58. Folder Rio Grande Compact Commission Records, 1924-1941, 1970, Richard F. Burges Papers, Proceedings of Rio Grande Compact Conference Held Dec. 19-20-21, 1928 at Santa Fe, N.M., Box 2F471, RGCCR, 1924-1941, 1970, UTA.

perhaps result in the collapse of the negotiations." "Obviously," he attempted to reassure Leonard,

> Colorado and New Mexico could not be asked to guarantee that any certain quantity of water would be delivered to any particular locality in Texas. Their only responsibility was to see that Texas' equitable share was delivered at the state line, or, rather, delivered into Elephant Butte reservoir, which is the point of control.[215]

Federal control of Elephant Butte Reservoir as well as the water needs served by releases from the reservoir were two essential points that Clayton also stressed to attorney Sawnie B. Smith in October 1938. Smith had been hired by lower Rio Grande water users to file suit to stop ratification of the compact. In a letter to Clayton in late September 1938, he questioned the absence of provisions in the signed-yet-unratified compact concerning the "division of waters below Elephant Butte between the States of New Mexico and Texas" and "the amount of water to which Texas is entitled." Smith could "not find anything in the compact…which ties down and limits the use or division of the waters according to present usage and physical conditions, and nothing that would prevent controversy between the two States in the future regarding the division of the waters between the two States." "This omission," the attorney bluntly wrote, "is too obvious to have been inadvertent, and therefore unquestionably, the Commissioners had what they considered valid reason for it." On behalf of his clients, Smith asked for that reason.[216]

Writing back to Smith, Clayton insisted that New Mexico's delivery of water above Elephant Butte constituted the delivery of water to Texas and that all of the releases from Elephant Butte made in the course of federal project operations served requirements below the dam down to Ft. Quitman. As far back as the negotiations for the temporary compact, the commissioner noted, Elephant Butte had been the focus for deliveries to Texas. The parties had, in Clayton's words, "decided…that New Mexico's obligations as expressed in the compact must be with reference to deliveries at Elephant Butte reservoir, and this provision was inserted in the temporary compact [i.e., Article XII of the temporary compact]." He insisted that that the "reasons" for this were "numerous," and "the obstacles in the way of providing for any fixed flow at the Texas were considered insuperable." Clayton drew specific attention to federal operational control of Elephant Butte and the flow of the water through the project's canals and down the river itself:

> The Rio Grande Project, as you know, is operated as an administrative unit by the Bureau of Reclamation, and the dam and releases from the reservoir are controlled by the Bureau and will continue to be at least until the federal government is repaid its investment, and

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[215] Frank B. Clayton, Rio Grande Compact Commissioner for Texas, to Hon. Homer L. Leonard, August 3, 1938, 2. Box 2F466, RGCC-FBCP, UTA.

[216] Sawnie B. Smith to Mr. Frank B. Clayton, Rio Grande Compact Commissioner for Texas, September 29, 1938. Box 2F466, RGCC-FBCP, UTA.

> very probably even beyond that time. Obviously, neither Colorado nor New Mexico could be expected to guarantee any fixed deliveries at the Texas line when the operation of the dam is not within their control but is in control of an independent government agency.
>
> Moreover, measurements of the water passing the Texas state line would be very difficult and expensive, if not impossible. This, for the reason that irrigation canals, ditches and laterals cross the line, which is of a very irregular contour, at many different points, carrying water in addition to what is carries in the river itself, and it would require continual measurements in these various channels to make any reasonably accurate computations of the total flow.

Texas's commissioner nevertheless indicated that federal management of Elephant Butte facilitated ultimate delivery of the Rio Grande water allocated to Texas above Ft. Quitman. Clayton observed that lands below Elephant Butte Reservoir received water through project operations by either contract or treaty – lands in New Mexico in EBID; lands in El Paso County, in EP #1; lands in Hudspeth County in HCCRD #1; and lands in Mexico. Contractual arrangements between the two project districts, EBID and EP #1, established the irrigable acreages in each, and Clayton expressed his conviction "that there will never by any difficulty about the allocation of this water" as a result.[217] As for the "lands above Fort Quitman and below the Rio Grande Project," the commissioner observed, they

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[217] According to Clayton, under "contracts between the districts under the Rio Grande Project [i.e., EBID and EP#1] and the Bureau of Reclamation…the lands within the Project have equal water rights, and the water is allocated according to the areas involved in the two States." "By virtue of the contract recently executed" – the so-called interdistrict agreement of February 16, 1938 – he explained to Smith,

> the total area is "frozen" at the figure representing the acreage now actually in cultivation: approximately 88,000 acres for the Elephant Butte Irrigation District, and 67,000 for the El Paso County Water Improvement District No. 1, with a "cushion" of three per cent. [*sic*] for each figure.

This "arrangement," Clayton acknowledged, was "of course a private one between the districts involved, and for that reason it was felt neither necessary nor desirable that it be incorporated in the terms of the Compact."

Historian Douglas Littlefield argues that the interdistrict agreement "rendered irrelevant" a New Mexico-Texas state line delivery. Characterizing the congressional authorization of the Rio Grande Project in 1905 as providing for a de facto "allocation" of water between New Mexico and Texas, he contends that the agreement "verified the Bureau of Reclamation's determination that the maximum irrigable acreage of the Elephant Butte Irrigation District was 88,000 acres and that of El Paso County Water Improvement District No. 1 was 67,000 acres." Littlefield, *Conflict on the Rio Grande*, 203 and 207.

The agreement was nonetheless "private" as Clayton recognized. While it was given Interior Department approval, the agreement was executed solely by the two districts, and it was concerned with the allocation of costs for the Rio Grande Project. Federal law obligated project water users to repay the costs incurred by the United States in building, operating, and maintaining a reclamation project. The original 1906 joint construction contract between EBWUA and EPVWUA, and the United States had specified "ten equal annual payments," "apportioned equally per acre among those acquiring such rights [i.e., the water users]." In 1918 and 1920, following the dissolution of the water users' associations and

their reconstitution as quasi-municipal entities with the power to tax individual members, new contracts were drafted that made irrigated acreage the basis for allocating shared projects costs between EBID and EP#1, respectively. Eight years later, in the summer of 1928, at the insistence of the water users and at the direction of Congress, the Interior Department extended the repayment schedule for the districts but retained acreage as the basis for repayments. See Construction Contract of Rio Grande Project, 6/27/06, section 4, page 4. ff. 430-A, Rio Grande Project. Joint Contract with Two Water Users Ass'ns, Box 818 Rio Grande 430- -430A, Entry 7; Department of the Interior, Bureau of Reclamation, Rio Grande Project-New Mexico-Texas, Contract Dated June 15, 1918 – between The United States of America and The Elephant Butte Irrigation For Repayment of Construction and Operation and Maintenance Charges, Article 6, Article 8, and Article 10; Department of the Interior, Bureau of Reclamation, Rio Grande Project-New Mexico-Texas, Contract Dated January 17, 1920 between The United States of America and The El Paso County Water Improvement District No. 1, For Repayment of Construction and Operation and Maintenance Charges, Article 7, Article 8, and Article 9, in Department of the Interior, Bureau of Reclamation, Rio Grande Irrigation Project, New Mexico-Texas, Contracts with Water User's Organizations (Copies), Compiled November 1, 1929. 232-29 RG Separate Folder, 249-H, Contracts with Water Users, Box 716 Old Box 509-510, Code 104.RG 37 through Code 402.RG 28, Engineering and Research Center, Project Reports, 1910-55, RG 115, NARA Denver; and *An Act Extending the time of construction payments on the Rio Grande Federal irrigation project, New Mexico-Texas*, May 28, 1928, chap. 815, 45 Stat. 785.

In early February 1929, facing the prospect of constructing additional drainage works for EP #1, Reclamation Chief Engineer R.F. Walter sought to determine more precisely the districts' respective obligations. He met with acting Rio Grande Project superintendent L.R. Fiock and EP #1 manager Roland Harwell; neither EBID's president nor its manager was able to appear but they made their opinions known. Harwell insisted that his district "wished to pay on 67,000 acres," with the caveat that nearly 2,000 acres currently in need of "river rectification or other work not provided by the district contract be delayed a reasonable length of time to permit such work being done by the land owners." As for EBID, its president "informally advised that 88,000 acres was desired by the district," and its manager telegrammed the same to Walter. Satisfied, federal reclamation officials agreed to a distribution of costs on the basis of these acreages: 88,000 acres for EBID and 67,000 acres for EP #1. Before a formal arrangement could be made, however, the global financial collapse precipitated by the US stock market crash of October 1929 cast into doubt the ability of any federal reclamation project's water users to meet their repayment obligations. See Elephant Butte Irrigation District, B.P. Fleming, Manager, telegram to R. F. Walter, Chief Engineer, Bureau of Reclamation, Feb. 16, 1929; Memorandum, From: Chief Engineer, To: Commissioner, Subject: Determination of irrigable acreage and total construction liability of the irrigation districts – Rio Grande Project, February 18, 1929. ff. 301. Rio Grande, Board & Engineering Reports on Construction Features, Oct. 1926 thru July 1929, Transfer Case, Box 913 Rio Grande 241.27—301; and Memorandum, From: Commissioner, To: Chief Engineer, Denver, Colo., Subject: Determination of irrigable acreage and total construction liability of the irrigation districts – Rio Grande Project, March 16, 1929. ff. 330. Rio Grande Project, Corres re Drainage of Seeped Lands. Thru December 31, 1928, Transfer Case, Box No. 921 Rio Grande 322.--430., Entry 7, RG 115, NARA Denver; and Donald J. Pisani, *Water and American Government: The Reclamation Bureau, National Water Policy, and the West, 1902-1935* (Berkeley: University of California Press, 2002), 149.

Congress twice extended the schedule for EBID and EP#1's repayments in the early 1930s, permitting continued deferment, and through 1936 both districts availed themselves of this opportunity. Execution of "adjustment contracts" in 1937, in which the districts relinquished their rights to hydroelectric power revenue at the newly-constructed Caballo Dam below Elephant Butte, reduced their obligations – but the allocation of repayment costs between the two districts remained outstanding. *An*

> receive only 'tail-end' or waste water, the land in the Hudspeth County district taking it water by virtue of a contract and the lands privately owned below the district lower boundary only by taking by gravity or pumps what happens to be in the river channel.

This was the "unavoidable waste" from the project-irrigated valleys above.[218]

Additional evidence that New Mexico's delivery of water at San Marcial was the delivery of water to Texas may be found in an undated "Analysis of the Terms of the Compact," authored by New Mexico State Engineer and Rio Grande Compact Commissioner Thomas B. McClure. In the piece, which summarizes the compact, McClure agrees with the explanation offered by Clayton to Smith regarding the absence of a state-line delivery to Texas, analogous to the state-line delivery to New Mexico from Colorado. "The subdivision of the basin at San Marcial," he stated

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Act For the temporary relief of water users on irrigation projects constructed and operated under the reclamation law, April 1, 1932, 47 Stat. 75, chapter 94; *An Act To extend the operation of the Act entitled, "An Act For the temporary relief of water users on irrigation projects constructed and operated under the reclamation law," approved April 1, 1932*, March 3, 1933, 47 Stat. 1427, chapter 200; *Project History, Rio Grande Project, Calendar Year 1932*, 20; and *Project History, Rio Grande Project, Calendar Year 1933*, 16; *Project History, Rio Grande Project, Calendar Year 1934*, 16; *Project History, Rio Grande Project, Calendar Year 1935*, 16; *Project History, Rio Grande Project, Calendar Year 1936*, 15. USBR PHRGP 1912-1988 (mf); Department of the Interior, Bureau of Reclamation, Contract Dated Nov. 9, 1937, Ilr-982, Elephant Butte Irrigation District (Adjustment of project construction charges and other purposes). ff. 222.- Rio Grande Project. Contracts with Elephant Butte Irrigation District, Separate Folder, Box No. 917, Rio Grande Pro. 222._222.-; Department of the Interior, Bureau of Reclamation, Contract Dated Nov. 10, 1937, Ilr-981, El Paso County Water Improvement District No. 1 (Adjustment of project construction charges and other purposes). ff. 222.- Rio Grande Project. Irrigation Districts, El Paso County Water Improvement District No. 1, Separate Folder, Box No. 918 Rio Grande Pro. 222._222.-, Entry 7, RG 115, NARA-Denver.

Resolution of the cost apportionment question finally came with signing of the interdistrict agreement, six months of negotiations between the districts and Reclamation and Interior Department officials. The agreement memorialized the historical distribution of repayment costs for storage and general project features between EBID and EP#1 on the basis of the respective irrigated acreages that the districts themselves had committed to back in 1929 and which Reclamation agreed to serve in proportion to the available water supply: 88,000 acres in New Mexico, in EBID, and 67,000 acres in Texas, in EP #1. Contract between Elephant Butte Irrigation District of New Mexico and El Paso County Water Improvement District No. 1 of Texas, signed February 16, 1938, and approved by Assistant Secretary of the Interior Oscar L. Chapman, April 11, 1938. ff. 400. Rio Grande, Lands-General, 1930 thru, Box 932 Rio Grande Pro. 400.__400.08, Entry 7, RG 115, NARA Denver.

Whether the interdistrict agreement accomplished a de facto allocation of water between New Mexico and Texas as Littlefield maintains or was focused solely on the allocation of the cost of the federal project between the districts, this agreement, prior contracts between the federal government and EBID and EP #1, the Hudspeth Warren Act contract, and the 1906 Mexican treaty all underscore federal management and control over the waters delivered by New Mexico at San Marcial.

[218] Frank B. Clayton, Rio Grande Compact Commissioner for Texas, to Mr. Sawnie B. Smith, October 4, 1938. Box 2F466, RGCC-FBCP, UTA; and Littlefield, *Conflict on the Rio Grande*, 213-214.

unequivocally, "is necessary because the Rio Grande Project of the Bureau of Reclamation must be operated as a unit."[219]

As these statements by Clayton and McClure, and the service to lands beyond the Rio Grande Project down to Ft. Quitman make plain, New Mexico's San Marcial delivery per the compact was the state-line delivery to Texas. Water captured and stored in Elephant Butte Reservoir on release and re-use served lands not only within the Rio Grande Project but also downstream to Ft. Quitman. Calculations of the demands on the federal reservoir by federal engineers and the engineering advisors to the Rio Grande Compact commissioners recognized the dependence of these lands on the reservoir's water supply. The commissioners themselves understood that that water delivered to the reservoir would be under federal control, and thus a state-line delivery by New Mexico to Texas, similar to the state-line delivery by Colorado to New Mexico, was impractical.

[219] Thomas B. McClure, State Engineer, "Analysis of the Compact," undated, 21-22. NM_00164500 – NM_00164501.

Opinion VI: The Special Master fairly described the background history leading to the 1938 Rio Grande Compact on pages 31 through 187 and 203 through 209 of the *First Interim Report of the Special Master*, dated February 9, 2017.

Having reviewed the background history leading to the 1938 Rio Grande Compact presented on pages 31 through 187 and 203 through 209 of the *First Interim Report of the Special Master*, dated February 9, 2017 as well as the materials appended to it, it is my expert opinion that the Special Master fairly described that history. I base my opinion not only on my professional knowledge and expertise, but also on the historical records that I examined in the course of researching and analyzing the history of the 1938 Rio Grande Compact, many of which are cited in the opinions above.

Exhibit 16

JRP Historical Consulting LLC

December 30, 2019

EXPERT REBUTTAL / SUPPLEMENTAL REPORT OF:

Scott A. Miltenberger, Ph.D.

In the matter of:

No. 141, Original
In the Supreme Court of the United States
State of Texas v. State of New Mexico and State of Colorado

Prepared for:

Somach Simmons & Dunn
500 Capitol Mall, Suite 1000
Sacramento, CA 95814

Prepared by:

Scott A. Miltenberger, Ph.D.
JRP HISTORICAL CONSULTING, LLC
2850 Spafford Street
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Introduction

I, Scott A. Miltenberger, Ph.D., am a partner at JRP Historical Consulting, LLC (JRP), located at 2850 Spafford Street, Davis, California. This expert rebuttal / supplemental report was prepared by me for Somach Simmons & Dunn, attorneys representing the State of Texas before the Supreme Court of the United States in *State of Texas v. State of New Mexico and State of Colorado*, No. 141, Original. I have been asked to address the following questions:

1. In her expert report, Dr. Jennifer Stevens opines, in part, that "The scientific understanding of connections between groundwater and surface water was too nascent in the first decades of the 20th century for Reclamation to have intended" appropriation of "the Upper Rio Grande Basin's groundwater" (Opinion 5, p. 11), and that "Scientific understanding of the relationship between surface and groundwater supplies in the Upper Rio Grande Basin was still in its infancy at the time of the 1938 Rio Grande Compact negotiations…." (Opinion 6, p. 11). Based on your research, what is your opinion as to the "scientific understanding" of the relationship between surface flow and groundwater in the Upper Rio Grande Basin and why?
2. Can you determine from your research what period of record formed the bases for the delivery schedules set forth in Articles III and IV of the 1938 Rio Grande Compact, and if so, what is the relevant period of record relied on by the Compact negotiators?

In formulating my responses, as with my expert report, I have relied upon my education and nearly 13 years of experience as a professional historian, primarily of western water and land use, as well as my review and analysis of historical documents, published sources, and academic monographs collected by me or those at my firm in connection with this action. I have further examined Dr. Jennifer Stevens' report, Mr. Nicolai Kryloff's expert report for the United States, and documents produced by the states of Texas, Colorado, and New Mexico, and the United States in this action.

Sources upon which I relied are cited in the history profession's preferred footnote citation format as detailed in the *Chicago Manual of Style*. If any other historical material is presented or made known to me, or if I review any additional documents, it may have some effect on the specific opinions offered herein.

office than they could internal federal reclamation reports from the early 1910s. Yet, setting aside the New Mexico 1913 seepage study, which predated completion of Elephant Butte Reservoir did not scrutinize lands below the dam; Barrows' November 1928 investigation, which only studied the reach of the Rio Grande between Elephant Butte and Leasburg dams; and Hosea's 1928 examination of available river hydrographs, with no apparent fieldwork, federal and state investigations appear to point to an inter-relationship between surface flow and groundwater in the Rincon and Mesilla valleys in New Mexico, prior to the project and Compact and following the Compact. The published USGS reports in 1905, 1907, and 1954 examined this hydrological phenomenon, and WSP 1230 elaborated on and confirmed the findings of Conover's 1947 "preliminary memorandum" that was provided to EBID and likely OSE.

Later actions by New Mexico State Engineer S.E. Reynolds suggest that he came to accept these findings over time, whether he examined Conover's work or any other study. In the mid-1950s, Reynolds recognized a connection between surface flow and subsurface waters in the lands above Elephant Butte in the "Middle Valley" between the Colorado-New Mexico state line and the federal reservoir. Two years after publication of WSP 1230, in 1956, citing a "scientific investigation" of the issue, the state engineer declared an "underground water basin," the "Rio Grande Underground Water Basin" for the Middle Valley. In making this declaration, he noted that "the waters of said basin are interrelated with the flow of the Rio Grande Stream System, so that such underground waters are a substantial source of the flow of said stream system," and that "the waters of the Rio Grande Stream System are fully appropriated."[55]

Twelve years later, Reynolds reiterated his understanding of the relationship between surface flow and "ground water" in the Upper Rio Grande Basin. In "The Rio Grande Compact," a paper prepared in April 1968 for a symposium on "International Water Law Along the Mexican-American Border," held at the University of Texas at El Paso.[56] Reynolds' remarks, made in the context of a dispute over the waters of the Rio Grande between Colorado on the one hand and

[55] S.E. Reynolds, State Engineer, Order Declaring the Rio Grande Underground Water Basin, November 29, 1956. ff. 245 Public Works Committee, Middle Rio Grande River - Elephant Butte Dam. 1957-58, 85th Cong, Box 6, Serial No. 6401. File 235-245, 246-254, 255-257, John Dempsey Papers, NMSA.

[56] The copy of Reynolds' paper collected by JRP came from the State Engineer's records deposited at the New Mexico State Archives and Records Center, as cited below. Subsequent research revealed that the paper had been given at this symposium and published by the University of Texas at El Paso as well as the Southwestern and Rocky Mountain Division of the American Association for The Advancement of Science. See S.E. Reynolds, State Engineer, State of New Mexico, "The Rio Grande Compact," in Clark S. Knowlton, ed., *International Water Law Along the Mexican-American Border*, Contribution No. 11 of The Committee on Desert and Arid Zones Research, Southwestern and Rocky Mountain Division, A.A.A.S. (El Paso: University of Texas, 1968): 48-62.

Reynolds' shifting views, however, may be less indicative of a legal strategy and more indicative that by the 1980s the state engineer had come (or was coming) to recognize what Slichter, Lee, Bliss, and Conover had found for the Rincon and Mesilla valleys earlier in the century and which he himself had acknowledged to be the "hydrologic facts of life" for the Upper Rio Grande Basin above Elephant Butte in 1956: that surface flow and groundwater were hydrologically connected. In 1982, OSE produced a brief paper, entitled "Rio Grande, Elephant Butte Dam to El Paso, Texas," that summarized the result of "[a] study of streamflow depletion in the Rio Grande Valley between Elephant Butte Dam and El Paso, Texas," plotted on four figures.[62] Figure 1, a double

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In late 1983, the appeals court vacated Bratton's ruling and remanded the case back to the lower court for reconsideration. New Mexico in February 1984, in Bratton's later words, "enacted a two year moratorium on new appropriations of groundwater hydrologically connected to the Rio Grande below Elephant Butte." The US district judge once again found for El Paso in August 1984, deciding that the moratorium violated the Interstate Commerce Clause and reaffirming his prior ruling. The legal battle dragged until 1989 when the US Court of Appeals for the District of Columbia Circuit ruled that no live controversy remained. United States District Court for the District of New Mexico, *Ray Pearson, Carlton C. Homan, Jr., Louie Giallanza, Clinton E. Wolf,* and *Thomas D. Westfall*, Plaintiffs, v. *S. E. Reynolds*, individually and as State Engineer of New Mexico, *Paul Bardacke*, individually and as Attorney General of New Mexico, *Lalo Garza*, individually and as New Mexico District Attorney for Dona Ana County, Defendants, *Elephant Butte Irrigation District, The City of Las Cruces, New Mexico, and Stahmann Farms, Inc.*, Defendant-Intervenors, Civ. No. 80-730 HB, August 3, 1984. 597 F. Supp. 694; 1894 U.S. Dist. LEXIS 24568; 15 ELR 20259; United States District Court for the District of New Mexico, *Ray Pearson, Carlton C. Homan, Jr., Louie Giallanza, Clinton E. Wolf,* and *Thomas D. Westfall*, Plaintiffs, v. *S. E. Reynolds*, individually and as State Engineer of New Mexico, *Paul Bardacke*, individually and as Attorney General of New Mexico, *Lalo Garza*, individually and as New Mexico District Attorney for Dona Ana County, Defendants, *Elephant Butte Irrigation District, The City of Las Cruces, New Mexico, and Stahmann Farms, Inc.*, Defendant-Intervenors, Civ. No. 80-730 HB, August 17, 1984. 1984 U.S. Dist .LEXIS 24276; and United States Court of Appeals for the District of Columbia Circuit, *In re Applications of El Paso*, No. 88-5357, September 22, 1989, Argued; October 20, 1989, Decided. 887 F. 2d 1103; 1989 U.S. App. LEXIS 15897; 281 U.S. App. D.C. 112; 15 Fed. R. Serv. 3d (Callaghan) 22. Provided by Somach Simmons & Dunn.

[62] The paper discussed below, for which an author is unidentified, was collected from the Joseph F. Friedkin Papers (MSS 555), deposited at the C. L. Sonnichsen Special Collections Department, University of Texas, El Paso (UTEP), University Library. The Friedkin Papers consist of correspondence, memoranda, studies and reports, and other historical materials previously maintained and in the possession of Joseph F. Friedkin, head of the US Section of the IBWC from 1962 to 1986. The commission is an international bilateral organization with representatives and technical staff from the US and Mexico, charged with overseeing the various boundary and water treaties between the two countries, particularly with regard to the Rio Grande. Assuring the delivery of 60,000 acre-feet of water from the Rio Grande annually to Mexico in accordance with the Convention of 1906 is a central responsibility of the IBWC.

At the time of JRP's research, the Friedkin Papers were only partially described and organized to archival standards. From an "initial inventory" of the collection (developed by special collections staff), I identified relevant boxes and folders. The document in question was located in box 1, folder 11 – a folder described in the "initial inventory" as "Correspondence and data concerning Mesilla Valley pumping, 1982." Rio Grande, Elephant Butte Dam to El Paso, Texas" was included with a group of three other documents in the folder dating to July 1985. Of these other documents, a July 15, 1985 memorandum to

IN THE SUPREME COURT OF THE UNITED STATES
BEFORE THE OFFICE OF THE SPECIAL MASTER
HON. MICHAEL J. MELLOY

STATE OF TEXAS	)	
	)	
Plaintiff,	)	
	)	Original Action Case
VS.	)	No. 220141
	)	(Original 141)
STATE OF NEW MEXICO,	)	
and STATE OF COLORADO,	)	
	)	
Defendants.	)	

****

REMOTE ORAL AND VIDEOTAPED DEPOSITION OF
SCOTT MILTENBERGER
JUNE 8, 2020

****

REMOTE ORAL AND VIDEOTAPED DEPOSITION of SCOTT MILTENBERGER, produced as a witness at the instance of the Defendant State of New Mexico, and duly sworn, was taken in the above-styled and numbered cause on June 8, 2020, from 9:03 a.m. to 3:30 p.m., before Heather L. Garza, CSR, RPR, in and for the State of Texas, recorded by machine shorthand, at the offices of HEATHER L. GARZA, CSR, RPR, The Woodlands, Texas, pursuant to the Federal Rules of Civil Procedure and the provisions stated on the record or attached hereto; that the deposition shall be read and signed.

irrigable acreage of the Rio Grande project situated in Texas. Historically, this ratio has been 57 percent New Mexico and 43 percent in Texas." Based on your review of the historic record, do you agree with that statement?

A. Yes.

Q. All right. Paragraph 10. Again, I'm looking at the first part of this paragraph. It says, "The Rio Grande Compact did not specifically identify quantitative allocations of water below Elephant Butte Dam as between southern New Mexico and Texas, nor did it articulate a specific state line delivery allocation. Instead, it relied upon the Rio Grande project and its allocation and delivery of water in relation to the proportion of Rio Grande project irrigable lands in southern New Mexico and in Texas to provide the basis of the allocation of Rio Grande waters between Rio Grande project beneficiaries in southern New Mexico and the State of Texas." Based on your historic review, do you agree with that statement?

A. Yes.

Q. All right. There's another document I want to get you to look at, and I'm marking this as Exhibit SAM 6. Again, please let me know when that comes up.

A. Every project is different, as I said, and, again, it really depends on the research question you're attempting to address or answer.

Q. Now, you've said that a number of times. Why do you keep suggesting that it depends on the research question you're attempting to answer?

A. Because I think different questions invite different -- different documents, potentially different approaches.

Q. Which is to say that the question you're attempting to answer is going to impact the research that you do?

A. It helps to frame the research you do, yes.

Q. Does it limit the research that you do?

A. Potentially in some ways.

Q. In your work on this case, did you feel constrained by the questions that you were asked to answer?

A. No.

Q. Were you constrained in any way?

A. No.

Q. In your work on this case, did you have an opportunity to review the actions and documents created after the Compact?

A. We examine -- excuse me -- we did collect and

IN THE SUPREME COURT OF THE UNITED STATES
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STATE OF TEXAS	)	
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Plaintiff,	)	
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	)	(Original 141)
STATE OF NEW MEXICO,	)	
and STATE OF COLORADO,	)	
	)	
Defendants.	)	

THE STATE OF TEXAS :
COUNTY OF HARRIS :

I, HEATHER L. GARZA, a Certified Shorthand Reporter in and for the State of Texas, do hereby certify that the facts as stated by me in the caption hereto are true; that the above and foregoing answers of the witness, SCOTT MILTENBERGER, to the interrogatories as indicated were made before me by the said witness after being first remotely duly sworn to testify the truth, and same were reduced to typewriting under my direction; that the above and foregoing deposition as set forth in typewriting is a full, true, and correct transcript of the proceedings had at the time of taking of said deposition.

I further certify that I am not, in any capacity, a regular employee of the party in whose

behalf this deposition is taken, nor in the regular employ of this attorney; and I certify that I am not interested in the cause, nor of kin or counsel to either of the parties.

That the amount of time used by each party at the deposition is as follows:

MR. WECHSLER - 04:26:04
MR. HOFFMAN - 00:00:00
MR. DUBOIS - 00:00:00
MR. WALLACE - 00:01:59
MS. O'BRIEN - 00:00:00
MS. BARNCASTLE - 00:00:00

GIVEN UNDER MY HAND AND SEAL OF OFFICE, on this, the 22nd day of June, 2020.

HEATHER L. GARZA, CSR, RPR, CRR
Certification No.: 8262
Expiration Date: 04-30-22

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800-745-1101

Exhibit 18

IN THE SUPREME COURT OF THE UNITED STATES

STATE OF TEXAS,

Plaintiff(s),

vs.

STATE OF NEW MEXICO and
STATE OF COLORADO,

Defendant(s).

DEPOSITION OF SCOTT A. MILTENBERGER, PH.D.
Sacramento, California
Wednesday, October 2, 2019
Volume I

Reported by:
Carrie Pederson
CSR No. 4373, RMR, CRR
Job No. 3524789
Pages 1 - 138

if I may get some more water.

Q. Of course.

A. Thank you.

(Pause)

BY MR. ROMAN:

Q. In reviewing the United States's Expert Historian Report, were there any of its conclusions that you questioned or disagreed with?

A. None that I can recall as I sit here.

Q. Would you characterize your review of that report as in-depth or cursory or somewhere in between?

A. Well, I guess I would want to know what you mean by "in-depth."

Q. Very reasonable question. First question is did you review it more than once?

A. Yes.

Q. Did you review any of the source materials cited therein that were different from your own source materials?

A. I believe so.

Q. Did your review of the United States's Expert Historian Report cause you to consider adding or revising any of the opinions in your disclosed report?

I, the undersigned, a Certified Shorthand Reporter of the State of California, do hereby certify:

That the foregoing proceedings were taken before me at the time and place herein set forth; that any witnesses in the foregoing proceedings, prior to testifying, were duly sworn; that a record of the proceedings was made by me using machine shorthand which was thereafter transcribed under my direction; that the foregoing transcript is a true record of the testimony given.

Further, that if the foregoing pertains to the original transcript of a deposition in a Federal Case, before completion of the proceedings, review of the transcript [ ] was [ ] was not requested.

I further certify I am neither financially interested in the action nor a relative or employee of any attorney or party to this action.

IN WITNESS WHEREOF, I have this date subscribed my name.

Dated: October 15, 201

Carrie Pederson

CARRIE PEDERSON

CSR No. 4373

Exhibit 19

Context of the 1938 Rio Grande Compact

Submitted to:

U.S. Department of Justice

Submitted by:
Nicolai Kryloff

Historical Research Associates, Inc.
Washington, D.C.

May 31, 2019

Historical Research Associates, Inc.

the water users within its boundaries the charges assessed against them and pay it over to the United States Government."[48]

In all, Special Master Grimsal found that the Rio Grande Compact Commission, in negotiating the 1938 Rio Grande Compact, "fully relied upon the existing Rio Grande Project to impart Texas' and lower New Mexico's respective equitable apportionments of Rio Grande waters." He observed that New Mexico did not dispute this conclusion. It was "unfathomable," he wrote, that Texas would have agreed to the 1938 Compact if New Mexico had been allowed to "simply recapture the water it delivered to the Project, destined for Texas, upon its immediate release from the Reservoir."[49] To Special Master Grimsal, the Rio Grande Compact parties understood that water for Texas would be apportioned through the Rio Grande Project.

Supreme Court Opinion

On March 5, 2018, the U.S. Supreme Court issued an opinion that agreed with Special Master Grimsal's general proposition: The 1938 Rio Grande Compact incorporated the Rio Grande Project as the vehicle for delivering Texas' apportionment. In the opinion, Justice Neil Gorsuch noted that "downstream contracts," between the federal government and the irrigation districts under the Rio Grande Project, resolved apportionment issues between New Mexico and Texas below Elephant Butte Reservoir, based on irrigable acres in each state under the project—roughly 57 percent for New Mexico and 43 percent for Texas.[50]

The Supreme Court viewed the 1938 Compact as being "inextricably intertwined with the Rio Grande Project and the Downstream Contracts." Gorsuch wrote that the compact could only achieve its purpose of "equitable apportionment" of the Rio Grande, because at the time of the compact's signing, the federal government had assumed a legal responsibility to deliver a certain amount of water to Texas through the downstream contracts.[51] Additionally, the Court pointed out that New Mexico conceded that the United States had an integral role in compact operations, by virtue of its responsibility for water delivery under the downstream contracts.

In the Supreme Court's opinion, the United States served as a sort of "agent" of the Rio Grande Compact, with the downstream contracts implicitly incorporated into the compact's terms. These contracts were, in the opinion of the Court, "themselves essential to the fulfillment of the compact's

[48] Proceedings of Meeting between Representatives of Lower Rio Grande Water Users and Representatives of Irrigation Districts Under the Rio Grande Project of the Bureau of Reclamation, May 27, 1938, 14.

[49] First Interim Report, 209.

[50] *Texas v. New Mexico et al.*, 583 U.S. ___ (2018), 2.

[51] *Texas v. New Mexico et al.*, 583 U.S. ___ (2018), 5–6.