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William A. Paddock

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THE RIO GRANDE COMPACT OF 1938

WILLIAM A. PADDOCK[†]

[†] William A. Paddock is a member of the Denver, Colorado, law firm Carlson, Hammond, and Paddock, L.L.C., where he represents various municipal, agricultural, development, special districts, and individual interests in water rights, real property, contracts, environmental, and other related issues. From 1982 to 1984, he served as First Assistant Attorney General in the Water Rights Section of the Colorado Attorney General's Office. He is the author of several articles, including: *Development of Winning Strategies in Complex Water Cases; Presentation of New and Updated Scientific Technology in Judicial Proceedings, Practical Considerations for Effective Use of Experts and Computer Models in Complex Groundwater Litigation; A Selective Comparison - The Role of the State Engineer in Determination of Water Rights in Five Western States; The New Dam Safety and Dam Construction Regulations, Nontributary Ground Water: A Continuing Dilemma; and The Rio Grande Convention of 1906, A Brief History of an International and Interstate Apportionment of the Rio Grande.* Mr. Paddock received his J.D. and B.A. from the University of Colorado at Boulder. He is a member of the Colorado Bar, and is admitted to practice before the United States Supreme Court, the United States Court of Appeals for the Tenth Circuit, and the United States District Court for the State of Colorado.

* William A. Paddock, *The Rio Grande Convention of 1906: A Brief History of an International and Interstate Apportionment of the Rio Grande*, 77 DENV. U. L. REV. 287 (1999). Reprinted in part by permission of *Denver University Law Review.*

I. INTRODUCTION

Rising in Colorado's San Juan Mountains and flowing south, the Rio Grande travels 1,800 miles before reaching the Gulf of Mexico.[1] Over its course, the River traverses 150 miles through Colorado, 400 miles across New Mexico, and forms the 1,250 mile border between Texas and the Republic of Mexico.[2] Water usage divides the Rio Grande into two sections, the Upper Rio Grande Basin ("Upper Basin"), and the Lower Rio Grande Basin ("Lower Basin"). The Upper Basin extends 650 miles from its headwaters in Colorado to Fort Quitman, Texas. Nearly all of the available flows in the Upper Basin are consumed by irrigation.[3] The Lower Basin, supplied with flows primarily from Mexico, extends from Fort Quitman to the Gulf of Mexico.[4]

The Upper Basin consists of three distinct sections: (1) the San Luis Valley in Colorado; (2) the section above San Marcial in New Mexico ("Middle Rio Grande"); and (3) the Elephant Butte-Fort Quitman section in southern New Mexico, western Texas, and northeastern Mexico.[5] The Rio Grande Compact of 1938 ("Compact") apportions the flows of the Upper Basin between these three sections, a drainage area of 31,100 square miles, excluding the Closed Basin in the San Luis Valley.

Water allocation controversies in the Upper Basin began with shortages in El Paso and Juarez in the late 1880s and early 1890s.[6] In an effort to address these shortages, in 1895 the United States imposed

1. NATURAL 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, at 7, 19 (1938) [hereinafter JOINT INVESTIGATION].
2. *Id.* at 7.
3. *Id.* at 7, 19.
4. *Id.* at 7.
5. *Id.* at 7.
6. *See* discussion *infra* Part III.

an embargo on the use of public lands for diversion and storage of water from the Rio Grande and its tributaries in Colorado and New Mexico.[7] In 1905, Congress authorized construction of the Rio Grande Project ("Project") to provide water for existing uses and to irrigate thousands of additional acres of land in southern New Mexico and western Texas.[8] One year later, the United States entered into a treaty with Mexico to deliver 60,000 acre-feet of water annually from Project Storage[9] to the Acequia Madre in Juarez, Mexico.[10] Throughout the duration of the embargo, water users above San Marcial, New Mexico, could not construct the reservoirs needed to make the water supply parallel to the needs of their crops. The embargo ended in 1925 and planning began for water storage in Colorado and the Middle Rio Grande in New Mexico. Colorado, New Mexico, and Texas declared a truce in the form of a temporary compact in 1929,[11] and nine years later, after a federally funded study of the Upper Basin, the states negotiated the final Compact.[12]

The Compact is unique because it apportions water based largely on geographic regions, not political boundaries. The geographic regions are: the San Luis Valley in Colorado; New Mexico above Elephant Butte Reservoir; and New Mexico and Texas below Elephant Butte Reservoir. Schedules of deliveries contained in the Compact establish the apportionment to Colorado and New Mexico. Below Elephant Butte Reservoir, a project water supply agreement controls allocation to New Mexico and Texas.

A committee of engineers largely conceived of and structured the Compact.[13] Those unfamiliar with the engineering studies and intent of the drafters may find the Compact difficult to understand. Thus, the purpose of this article is to describe the historical context that gave rise to the Compact, the objectives of the Compact, the engineering assumptions that underlie the Compact, and the geographic apportionment of water supplies effected by the Compact.

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7. *See infra* pp. 15-17.

8. *See infra* p. 17-19.

9. Rio Grande Compact, COLO. REV. STAT. art. I(K), § 37-66-101 (2001), 53 Stat. 785, 786.

10. See *infra* notes 200 to 214 and accompanying text. For a more detailed discussion, see William A. Paddock, *The Rio Grande Convention of 1906, A Brief History of an International and Interstate Apportionment of the Rio Grande*, 77 DENV. U. L. REV. 287 (1999).

11. *See* discussion *infra* Part IV.

12. *See* discussion *infra* Part VA.

13. *See* discussion *infra* Part VC.

II. DESCRIPTION OF THE BASIN AND ITS EARLY DEVELOPMENT

A. THE SAN LUIS VALLEY

The San Luis Valley is a high inter-mountain valley extending ninety miles from north to south and fifty miles from east to west.[14] The elevation of the valley floor ranges from 7,440 feet to 8,000 feet and mountains from 8,000 to 14,390 feet high encircle the valley.[15] The Rio Grande enters the valley from the west near the town of Del Norte, continues east across the valley, where it passes the town of Monte Vista and through the city of Alamosa. At Alamosa, it turns south and runs nearly forty miles before passing through a break in the San Luis Hills and entering a deep canyon above the New Mexico state line.[16]

An area known as the Closed Basin occupies the northern part of the San Luis Valley and contains 2,940 square miles of land that does not naturally drain to the Rio Grande.[17] A low topographic divide and a hydrologic divide separate the Closed Basin from the rest of the valley. The divide extends southeast from near Del Norte to a few miles north of Alamosa, then to the east side of the San Luis Valley.[18]

The principal tributary of the Rio Grande in Colorado is the Conejos River.[19] Rising in the southwest mountains of Colorado, the San Antonio and Los Piños Rivers join the Conejos before it flows northeast to its junction with the Rio Grande at Los Sauces.[20] Other tributaries of the Rio Grande from the west above the Conejos River include the Alamosa River and La Jara and Rock Creeks.[21] Due to extensive irrigation development upstream, these latter three tributaries contribute limited flows to the Rio Grande.[22]

The southeastern San Luis Valley extends east from the Rio Grande to the lower slopes of the Culebra Range.[23] The principal streams in this area, from north to south, are Trinchera, Culebra, and Costilla Creeks.[24] Costilla Creek, apportioned by the Amended Costilla Creek Compact, [25] originates in New Mexico, flows northwest for ten miles through Colorado, then turns south to join the Rio Grande in

14. JOINT INVESTIGATION, *supra* note 1, at 19.
15. *Id.*
16. *Id.*
17. *Id.*
18. *Id.*
19. JOINT INVESTIGATION, *supra* note 1, at 19.
20. *Id.* at 19-20.
21. *Id.* at 20.
22. *Id.*
23. *Id.* at 20.
24. JOINT INVESTIGATION, *supra* note 1, at 20.
25. *See* COLO. REV. STAT. § 37-68-101 (2001).

New Mexico.[26] Like the Alamosa, Rock, and La Jara, these streams contribute limited flows to the Rio Grande due to upstream reservoirs and extensive irrigation.[27]

The first permanent settlements in San Luis Valley were founded by Hispanic immigrants along the Conejos River and Culebra and Costilla Creeks in the 1850s.[28] Between 1850 and 1879, there was a small, steady migration of settlers to the San Luis Valley. By 1870, 50,000 acres were under irrigation in the valley, and by 1879, this had increased to about 122,000 acres.[29] The Denver and Rio Grande Railroad reached the San Luis Valley in 1879, prompting a large influx of settlers. Abundant stream flows between 1880 and 1888 fueled the building of large canals, including: the Rio Grande Canal (1,699 c.f.s.), the Monte Vista Canal (340 c.f.s.), the Empire Canal (512 c.f.s.), the San Luis Valley Canal (575 c.f.s.), the Farmers Union Canal (841 c.f.s.), the Prairie Ditch (367 c.f.s.), and the Costilla Ditch (103 c.f.s.). By 1889, 1,200 miles of canals supplied irrigation water to more than 300,000 acres, and by 1894 some 400,000 acres were being irrigated.[30] No ditches were constructed on the River below its confluence with the Conejos River. Consequently, those two stream systems operated independently.

A prolonged drought, beginning in 1889, led to the realization that the existing water supply was inadequate to serve all lands underlying the canals.[31] Thus, by 1892, most large canal construction ceased and acreage under irrigation was significantly reduced.[32] At this same time, water users commenced the initial adjudication of water rights on streams in the valley,[33] and by 1896, the priorities and rates of flow for most existing water rights had been determined.

The Rio Grande's use in Colorado increased marginally from 1896 to 1927, after which depletions held constant.[34] In 1936, shortly before final Compact negotiations began in earnest, there were approximately 700,000 acres under irrigation, including 278,000 acres in the Closed Basin. The predominate form of water consumption in the San Luis Valley has always been agricultural irrigation. The total irrigated area remains essentially the same today; the most recent detailed survey indicates approximately 612,700 acres were irrigated in

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26. JOINT INVESTIGATION, *supra* note 1, at 20.

27. S. DOC. NO. 55-229 at 54 (1898) [hereinafter SENATE DOC.]

28. *Id.* at 99.

29. NORRIS HUNDLEY, JR., DIVIDING THE WATERS: A CENTURY OF CONTROVERSY BETWEEN THE UNITED STATES AND MEXICO 19 (1966); Douglas Robert Littlefield, Interstate Water Conflicts, Compromises, and Compacts: The Rio Grande, 1880-1938, at 45 (1987) (unpublished Ph.D. dissertation, University of California, Los Angeles) (on file with the Denver Public Library).

30. *Id.*

31. SENATE DOC., *supra* note 27, at 55.

32. JOINT INVESTIGATION, *supra* note 1, at 69.

33. Colorado became a state in 1876 and, in 1879, adopted its first irrigation laws and adjudication statutes.

34. JOINT INVESTIGATION, *supra* note 1, at 13, 75.

1997.[35]

B. THE MIDDLE RIO GRANDE

The Middle Rio Grande Basin includes the Rio Grande and its tributaries between the Colorado-New Mexico state line and the San Marcial Narrows at the head of Elephant Butte Reservoir, a distance of about 270 miles.[36] The Rio Grande enters a canyon in southern Colorado, which gradually deepens as the river flows through northern New Mexico, past Taos. The canyon reaches a depth of more than 1,200 feet at Embudo, seventy miles south of the Colorado-New Mexico state line.[37] The Rio Grande's principal tributaries in this reach include, from the east: Rio Colorado, Rio Hondo, Rio Taos, and Embudo Creek. These streams, rising in the Sangre de Cristo Mountains, irrigate the mesas above the Rio Grande and contribute primarily flood and return flows to the Rio Grande.[38]

The Rio Grande emerges into the Española Valley below Embudo, where the Rio Chama joins it from the west, and Rio Santa Cruz from the east.[39] The Rio Chama drains approximately 3,200 square miles.[40] The Abiquiu Reservoir, built in 1963 as a flood control and storage reservoir with a capacity of 1.2 million acre-feet, regulates the Rio Chama. Thirty miles upstream from Abiquiu Reservoir are El Vado Reservoir, completed in 1935, with a capacity of 185,000 acre-feet, and Heron Reservoir, completed in 1970, with a capacity of 400,000 acre-feet. El Vado Reservoir serves the Middle Rio Grande Conservancy District,[41] and Heron Reservoir is part of the San Juan-Chama Project, a trans-basin diversion bringing water from the San Juan River Basin into the Rio Grande Basin.[42] The reach of the Rio Grande from the Colorado state line to its confluence with the Rio Chama contributes most of the Rio Grande's water supply in New Mexico.[43]

Below its confluence with the Rio Chama, the river enters White Rock Canyon.[44] At the end of the canyon is Cochiti Dam, a 500,000 acre-foot flood control reservoir.[45] Below Cochiti Dam, the Rio Grande meanders 150 miles through the Middle Rio Grande Valley, a long, narrow valley that ends at the San Marcial Narrows.[46] The San Felipe, Isleta, and San Acacia Narrows divide the valley, and define the Santo

35. Colo. Water Conservation Board, Rio Grande Support System, http://cdss.state.co.us/overview/rgdss/rgdss.asp

36. JOINT INVESTIGATION, *supra* note 1, at 20.

37. *Id.* at 20-21.

38. *Id.* at 21.

39. *Id.*

40. *Id.*

41. JOINT INVESTIGATION, *supra* note 1, at 21.

42. Act of June 13, 1962, Pub. L. No. 87-483, 76 Stat. 96 (codified at 43 U.S.C § 615ii (1994) (text omitted from United States Code)).

43. JOINT INVESTIGATION, *supra* note 1, at 20.

44. *Id.* at 21.

45. Act of July 14, 1960, Pub. L. No. 86-645, 74 Stat. 492-93.

46. JOINT INVESTIGATION, *supra* note 1, at 21.

Domingo, Albuquerque, Belen, and Socorro subvalleys.[47]

In the Santo Domingo Valley, the principal tributaries are: the Santa Fe and Galisteo Creeks, which enter the valley from, and flow into the Rio Grande from the east; Jemez Creek, which enters from the west, a few miles below the San Felipe Narrows; and the Rio Puerco and Rio Salado, which also enter from the west, just above the San Acacia Narrows.[48] The Rio Puerco and Rio Salado contribute meaningful amounts of water to the Rio Grande only during flash floods. Galisteo Reservoir, completed in 1970, controls the flood flows of Galisteo Creek. Jemez Canyon Reservoir, a 100,000 acre-foot reservoir completed in 1953, controls the flood flows of Jemez Creek.[49]

Irrigation in the Middle Rio Grande began around A.D. 400 with the first permanent Indian dwellings.[50] The Indians irrigated grains, squash, gourds, maize, and beans. The precursors of Indian pueblos appeared by A.D. 850 or A.D. 900,[51] and between the twelfth and seventeenth centuries, the Indian population grew and became concentrated in larger communities.[52] In the sixteenth century, when Spanish settlers first encountered the Indians in the Upper Rio Grande Basin,[53] there were about 60,000 Indians living in approximately 130 pueblos. During the first century of Spanish occupation, however, the population of the pueblos declined dramatically.[54] At that time, it is estimated that the remaining Pueblo Indians were irrigating more than 30,000 acres.[55] The Pueblo Indians drove the Spanish settlers out of the Middle Rio Grande during the Pueblo Revolt of 1680. The Spaniards did not reestablish control of the Middle Rio Grande until 1692. Shortly thereafter, the settlers founded Bernalillo and Albuquerque.[56]

To provide for irrigation, settlers diverted water from the Rio Grande and its tributaries through "acequias" or community ditches. From the establishment of Spanish settlements through the early 1900s, New Mexico had neither working irrigation laws nor a territorial engineer or other officials to control water distribution.[57] Consequently, there was no attempt to systematically distribute water among different ditches on the same stream. In addition, records were not kept documenting water use.[58] Due to the lack of reliable

47. *Id.*
48. *Id.*
49. *Id.*; *see also* Act of July 14, 1960, Pub. L. No. 86-645, 74 Stat. 492-93.
50. Stewart Peckham, *The Anazai Culture of the Northern Rio Grande Rift, in* RIO GRANDE RIFT: NORTHERN NEW MEXICO, 275, 276 (W. Scott Baldridge et al. eds., 1984).
51. John A. Ware, *Man on the Rio Grande: Introduction and Overview, in* RIO GRANDE RIFT: NORTHERN NEW MEXICO, 272 (W. Scott Baldridge et al. eds., 1984).
52. *Id.*
53. SENATE DOC., *supra* note 27, at 54.
54. Ware, *supra* note 51, at 272.
55. SENATE DOC., *supra* note 27, at 54.
56. *Id.*
57. *Id.* at 73.
58. *Id.* at 74.

records in this early period, it is impossible to accurately determine the total irrigated area in the Middle Rio Grande. Follett estimated that by 1896, approximately 161,000 acres were under irrigation.[59] In 1936, the Natural Resources Committee estimated that a maximum of 153,000 acres were under irrigation in the Middle Rio Grande.[60] The Middle Rio Grande Water Conservancy District supplied much of that irrigation water.[61]

C. THE ELEPHANT BUTTE-FORT QUITMAN SECTION

The Elephant Butte-Fort Quitman section of the Upper Rio Grande Basin covers 250 miles from San Marcial, New Mexico, to Fort Quitman, Texas.[62] In the first sixty-five miles below San Marcial downstream to the Caballo Narrows, the surrounding hills and mesas are close to the river and there is little valley land.[63] The eastern side of this reach includes the "Jornado del Muerto" (Dead Man's March), a long expanse of high desert where many early settlers perished.[64] Elephant Butte Dam now blocks the Rio Grande forty miles below the San Marcial Narrows.

Just below Elephant Butte Dam, the river enters the Palomas Valley, at the end of which is the Caballo Narrows, now occupied by Caballo Dam.[65] Caballo Dam, which began partial operations in 1938, has a capacity of approximately 300,000 acre-feet and impounds flood water and water released from Elephant Butte Reservoir. Below Caballo Dam, the river enters the Rincon Valley, which is approximately thirty miles long and, at most, two miles wide.[66] The Rincon Valley ends at Selden Canyon, where Mesilla Valley begins.[67] Mesilla Valley is one of the larger sub-valleys, extending fifty-five miles south to "the Pass," about four miles above El Paso.[68] It reaches its maximum width of about six miles near Las Cruces, New Mexico.[69] Below the Mesilla Valley is the El Paso Valley, which is about ninety miles long and four to six miles wide, extending south from El Paso to about ten miles below Fort Quitman, Texas.[70] There are no perennial tributaries to the Rio Grande in the Elephant Butte-Fort Quitman

59. *Id.* at 76-88.
60. JOINT INVESTIGATION, *supra* note 1, at 14.
61. *Id.* at 15.
62. *Id.* at 21.
63. *Id.* at 21-23.
64. *See* PAUL HORGAN, GREAT RIVER: THE RIO GRANDE IN NORTH AMERICAN HISTORY 169-70 (1984).
65. JOINT INVESTIGATION, *supra* note 1, at 23. Caballo Reservoir was built pursuant to the "Treaty for Rectification of the Rio Grande, Convention between the United States and Mexico." 1933, Treaty Series No. 864.
66. JOINT INVESTIGATION, *supra* note 1, at 23.
67. *Id.*
68. *Id.*
69. *Id.*
70. *Id.*

section.[71] Rather, the tributaries are only dry arroyos subject to flash floods.[72] The principal tributaries enter from the west between San Marcial and the Rincon Valley, and flood and sediment control reservoirs now regulate most of them.[73]

The land on the Mexican (west) side of the Rio Grande in this reach is called the Juarez Valley. The 1906 treaty with Mexico allocated 60,000 acre-feet of water to irrigate about 24,000 acres in the Juarez Valley.[74] The land on the Texas (east) side of the River is included in the El Paso County Water Improvement District No. 1 ("El Paso District") and the Hudspeth County Conservation and Reclamation District ("Hudspeth District"). The El Paso District was established to provide irrigation water to some 67,000 acres. The Hudspeth District typically makes no diversions from the River. Instead, tail water from the El Paso District, delivered via the District's Tornillo Drain into the Hudspeth Feeder Canal, supplies the Hudspeth District's water.

The first Spanish settlers in the Upper Rio Grande Basin above Fort Quitman arrived near El Paso in April 1598,[75] but did not establish the first permanent Spanish settlement, a mission dedicated to Our Lady of Guadalupe of El Paso, until 1659. The settlers located the Mission on the south side of the Rio Grande in present day Ciudad Juarez, Mexico. From 1700 to 1800, El Paso del Norte (current day Juarez) served as the gateway to Spain's northern colonies. By 1700, the Spanish population at El Paso del Norte was 3,588; it was 4,394 by 1779; and reached approximately 8,000 by 1821.[76]

Before 1827, there were no houses or cultivated lands east of the Rio Grande. Thereafter, settlement occurred slowly on the east side of the Rio Grande until the end of the Mexican-American War in 1846, when many new settlers began moving to the area. In 1859, U.S. Army Colonel Anson Mills established El Paso, an American town with a population of only 300; while across the River, the population in and around Juarez was approximately 13,000.[77]

With settlement came irrigation. By 1851, the settlers had cultivated large areas on both sides of the Rio Grande.[78] Major Emory reported to President Franklin Pierce that cultivation extended along the Rio Grande for twenty miles below present day Juarez, an area of 32,000 acres.[79] In 1896, Follett estimated that some 40,000 acres were under irrigation, more than half on the Mexican side of the River.[80]

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71. JOINT INVESTIGATION, *supra* note 1, at 23.
72. *Id.*
73. *Id.*
74. 34 Stat. 2953, T.S. No. 455; *see also* Littlefield, *supra* note 29, at 190-193.
75. SENATE DOC., *supra* note 27, at 54.
76. JOINT INVESTIGATION, *supra* note 1, at 71-72.
77. *Id.* at 72.
78. *Id.*
79. *Id.*
80. *Id.* at 74-89.

Settlements were also being established upstream in the Mesilla, Rincon, and Palomas Valleys, which after 1848 were in the United States Territory of New Mexico.[81] By the 1870s, the settlers were irrigating large land areas in the Mesilla Valley, but the recurring cycle of flood and drought made this irrigation difficult to sustain.[82] By 1896, the settlers were irrigating about 9,850 acres between San Marcial and old Fort Seldon (near Leasburg, New Mexico), along with 27,100 acres between old Fort Seldon and The Pass four miles above El Paso.[83]

III. THE RIO GRANDE CONVENTION OF 1906

Snowmelt and late summer rains feed the Rio Grande, so the bulk of the water supply is available only during the short spring runoff. Late season flows are typically small unless supplemented by infrequent rains. Given the nature of the Rio Grande, seasonal water supply shortages were neither rare nor unexpected, and storage was essential to a reliable irrigation supply in the Upper Rio Grande Basin. With the onset of a drought in the late 1880s, the people of both El Paso and Juarez in the Republic of Mexico began intense complaints about water shortages. At that time, Colonel Anson Mills proposed construction of a dam just upstream of El Paso. The dam would store 1.65 million acre-feet of floodwaters and serve both the United States and Mexico.[84] By 1890, the pressure from Mexico over water shortage prompted Congress to pass a joint resolution authorizing negotiations with Mexico for a solution to the water supply problems and the related boundary issues.[85]

Not until 1896, however, did Mexico and the United States finally enter into a protocol calling upon members of the International Boundary Commission ("I.B.C.")[86] to make an investigation and prepare a report addressing: (1) the amount of water taken from the Rio Grande through irrigation canals in the United States; (2) the average amount of water in the River, year by year, before and after the construction of those canals; and (3) whether a dam across the River near El Paso, or elsewhere, would be the best means to regulate the Rio Grande and secure for the inhabitants of both countries their

81. JOINT INVESTIGATION, *supra* note 1, at 73-74.

82. *Id.*

83. *Id.*

84. Littlefield, *supra* note 29, at 17-18.

85. DEPARTMENT OF STATE, PROCEEDINGS OF THE INTERNATIONAL (WATER) BOUNDARY COMMISSION, UNITED STATES AND MEXICO 275 (1903) [hereinafter I.B.C. PROCEEDINGS].

86. *Id.*; *see also* Littlefield, *supra* note 29, at 53. The Convention of July 29, 1882, first established the International Boundary Commission as a temporary commission to resurvey and monument the western land boundary between the United States and Mexico. The Commission became a permanent body in 1889, and its duties came to include administration of water. In 1944, its name changed to the International Boundary and Water Commission. *See* Convention-Mexico, July 29, 1882, 22 Stat. 986; Convention-Mexico, Nov. 12, 1886, 24 Stat. 1011; Convention-Mexico, Mar. 1, 1889, 26 Stat. 1512; Convention-Mexico, Mar. 20, 1905, 35 Stat. 1863.

legal and equitable rights and interests to the water.[87]

In 1895, the Department of Interior approved the Rio Grande Dam and Irrigation Company's ("Rio Grande Company")[88] application for a right-of-way for a proposed dam near Elephant Butte in the New Mexico Territory. The Rio Grande Company stated it would build the world's largest artificial lake, impounding 253,370 acre-feet of water for colonization and irrigation of lands downstream to Fort Quitman.[89] Mexico promptly protested the proposed dam, requesting the United States government to suspend all work on it.[90] In response, Secretary of the Interior Olney secured an embargo on any use of public lands that involved diversion of water from the Rio Grande and its tributaries in Colorado and in the New Mexico Territory.[91] Since the Department of Interior had already approved the Rio Grande Company's application, the suspension did not affect it.

In late 1896, the I.B.C. recommended the construction of an international reservoir to store some 535,000 acre-feet[92] at a site three and one-half miles above El Paso. In January of 1897, Mexico asserted that it had sustained $35 million in damages from increased water diversions in the United States and demanded the prompt construction of an international dam at El Paso. Mexico also asserted that the United States bear all costs in order to compensate for past damages to Mexico and its citizens.[93]

The United States then faced two problems. First, if the Rio Grande Company built the proposed dam at Elephant Butte, a reliable water supply would not exist for the proposed international dam at El Paso. Second, the proposed international dam would flood a substantial portion of the irrigated land in the Mesilla Valley. In May of 1897, the United States filed suit against the Rio Grande Company to prevent the construction of a reservoir near Elephant Butte.[94] After five years of litigation and no construction activity, the United States canceled the previously issued authorization for the dam.[95] In 1909, the United States Supreme Court sustained the cancellation.[96]

Meanwhile, with the adoption of the Reclamation Act of 1902, the newly created Reclamation Service set to work studying the relative merits of a dam at Elephant Butte versus an international dam at El Paso.[97] The Reclamation Service concluded that a site a near Elephant

87. I.B.C. PROCEEDINGS, *supra* note 85, at 275.

88. *See generally* HUNDLEY, *supra* note 29, at 25-28; Littlefield, *supra* note 29, at 71-117.

89. SENATE DOC., *supra* note 27, at 6.

90. *Id.* at 27.

91. *Id.* at 18. The suspension became effective December 5, 1896.

92. *Id.* at 41-46.

93. *Id.* at 179-180.

94. United States v. Rio Grande Dam & Irrigation Co., 174 U.S. 690 (1899).

95. Rio Grande Dam & Irrigation Co. v. United States, 215 U.S. 266 (1909); *see also* 66 CONG. REC. 586, 589-90 (1924-1925).

96. Rio Grande Dam & Irrigation Co. v. United States, 215 U.S. 266 (1909).

97. Littlefield, *supra* note 29, at 88.

Butte was the preferred location for a large reservoir.[98]

The Reclamation Service's October 1904 report found that a reservoir at Elephant Butte could store 2,000,000 acre-feet of water and provide a reliable yield of 600,000 acre-feet during most years; enough to irrigate 180,000 acres. The report also concluded that a dam at Elephant Butte could store three or four times more water than the international dam; spills would claim less water; and the Elephant Butte project would flood no land in the Mesilla Valley.[99]

In November 1904, the Reclamation Service presented its storage plan to the meeting of the Twelfth National Irrigation Congress in El Paso. After extensive negotiations and compromise, the Texas and New Mexico delegations fully supported the plan. The plan also received the qualified support of the Mexican delegation.[100] Congress approved legislation to authorize the construction of the project and the legislation was signed into law in 1905.[101]

Douglas Littlefield summarized the legislation's effect.

> First, when construed with the bill's legislative history, the Reclamation extension act gave congressional authority to the 1904 National Irrigation Congress compromise to build Elephant Butte Dam and to water irrigable lands along the Rio Grande below the dam. Second, the act provided that if the secretary of the interior determined there were enough lands in New Mexico, and Texas that would benefit from Elephant Butte Dam and that the cost of building the dam and irrigation works would be returned to the Reclamation Fund, he could proceed with the project "should all other conditions as regards feasibility be found satisfactory." . . . The feasibility requirement also meant that the irrigable lands would have to be precisely fixed by Reclamation Service surveys, and the specific lands to be watered would be identified by the secretary of the interior based on those surveys. In effect, this created an interstate apportionment between New Mexico and Texas based on [the Reclamation Service's] Irrigation Congress proposal. . . . That Congress intended to sanction such an apportionment is all the more apparent from the legislative debates leading up to the new law's enactment.[102]

The federal legislation did not address the allocation of water to Mexico.[103] Under the compromise reached at the 1904 Irrigation Congress, however, whatever water was allocated to Mexico would come directly from the overall allocation to Texas. The United States, with substantial help and prodding from the people of El Paso, gave Mexico a proposed treaty calling for the United States to build Elephant Butte Reservoir and to deliver 60,000 acre-feet annually to Mexico in the bed of the Rio Grande. Mexico would receive the same

98. *Id.*
99. *Id.* at 129-130.
100. *Id.* at 126-141.
101. Act of Feb. 25, 1905, ch. 798, 33 Stat. 814.
102. Littlefield, *supra* note 29, at 170-171.
103. Act of Feb. 25, 1905, ch. 798, 33 Stat. 814.

proportion of irrigation water as deliveries of irrigation water to the El Paso side of the river, except in the case of drought, when the United States and Mexico would share equally in any reductions. The proposed treaty also stated that the delivery of water to Mexico did not constitute recognition of Mexico's claims, and in exchange for the water, Mexico waived all claims to damages and all claims to waters of the Rio Grande above Fort Quitman.[104]

In March of 1906, Mexico replied with two requests: first, the annual delivery of 75,000 acre-feet, measured at the head of the Acequia Madre, and second, a guarantee that Mexico would receive one-half of all reservoir spills, excess releases, and inflow between Juarez and Fort Quitman.[105] The United States refused to yield, and by late May of 1906, the Mexican Ambassador nevertheless signed the treaty,[106] which the United States then ratified.[107]

IV. THE TEMPORARY RIO GRANDE COMPACT OF 1929

The ratification of the treaty did not immediately lift the embargo on the use of any public lands in the Upper Rio Grande Basin for water development. Rather, the United States selectively modified the embargo to allow certain small projects to proceed.[108] Colorado and New Mexico deeply resented this because the embargo effectively prevented any large reservoir construction.[109] This, in turn, prevented any regulation of the Rio Grande above Elephant Butte for either flood control or water conservation purposes. The embargo served the Reclamation Service's goal of preventing new upstream depletions. Upstream water users, however, perceived it as enormously unfair because it left them at the mercy of the recurrent cycles of flood and drought while water users below Elephant Butte had a guaranteed water supply. New Mexico and Colorado's continued complaints led to slight relaxations of the embargo. By 1907, agreements modifying the embargo allowed for storage diversions not exceeding 1,000 acre-feet and initiated before March 1, 1903, the date when active work on the project began.[110]

Relaxation of the embargo also allowed for some limited reservoir construction in the San Luis Valley.[111] Rio Grande Reservoir, with a 51,000 acre-foot capacity, and Santa Maria Reservoir, with a 43,800 acre-foot capacity, constructed in the headwaters of the Rio Grande, were both a result of the embargo's relaxation.[112] La Jara Reservoir on La Jara Creek, constructed in 1910, combined with Terrace Reservoir

104. *Id.* at 193-194.
105. Littlefield, *supra* note 29, at 194.
106. *Id.* at 196.
107. H. REP. DOC. NO. 59-458 (1907).
108. *See* 66 CONG. REC. 591 (1924).
109. *Id.*; *see also* 70 CONG. REC. 3635 (1924).
110. JOINT INVESTIGATION, *supra* note 1, at 67.
111. *Id.*
112. *Id.* at 67-68.

on the Alamosa River, constructed in 1912, produced a capacity of 32,000 acre-feet.[113] At about the same time, Trinchera Creek saw the construction of Mountain Home and Smith Reservoirs, and Culebra Creek became home to Sanchez Reservoir.[114] Relaxation of the embargo did not result in the construction of any reservoirs of consequence in the Middle Rio Grande.

In 1925, the federal government lifted the embargo entirely,[115] and did not reimpose it until 1935 to hasten negotiations of a final compact.[116] In 1928, Continental Reservoir, in the headwaters of the Rio Grande, with a capacity of approximately 27,000 acre-feet, was completed.[117] Thereafter, intense opposition from Texas and New Mexico thwarted further reservoir construction in Colorado.[118] New Mexico did not fare much better after 1925. Increased seepage and water logging of land continued to reduce the irrigated acreage in the Middle Rio Grande. In 1923, New Mexico adopted a Conservancy Act, and in 1925 created the Middle Rio Grande Water Conservancy District. The district adopted a plan for flood control, drainage, and irrigation in the Middle Rio Grande that included construction of the 198,000 acre-foot El Vado Reservoir, completed in 1935.[119]

Authorization and construction of the Rio Grande Project, coupled with the embargo on use of public lands, caused a continued deterioration of relationships among Colorado, New Mexico, and Texas over the Rio Grande. As a result, compact negotiations were suggested, and in 1923, President Coolidge appointed Commerce Secretary Herbert Hoover as the United States representative to the Rio Grande Compact Commission.[120] Each state appointed a representative: Delph Carpenter for Colorado, Francis C. Wilson for New Mexico, T. H. McGregor for Texas, and the United States appointed William J. Donovan as the Commissioner.[121] Both Colorado and New Mexico then began engineering investigations to obtain necessary data for negotiations. Consequently, the states did not conclude the temporary compact until early 1929 ("1929 Temporary Compact").[122]

The 1929 Temporary Compact did not apportion the waters of the Rio Grande. Rather, it was a standstill agreement under which Colorado and New Mexico agreed not to increase their depletions of the Rio Grande unless new drainage projects offset any new depletions.[123] In addition, the temporary compact entitled Colorado

113. *Id.* at 68.
114. *Id.*
115. Joint Investigation, *supra* note 1, at 67.
116. *Id.* at 10.
117. *Id.* at 68.
118. *Id.* at 12.
119. *Id.* at 70.
120. Littlefield, *supra* note 29, at 262.
121. *Id.* at 274.
122. Act of June 17, 1930, ch. 506, Pub. L. No. 71-370, 46 Stat. 767.
123. Rio Grande Compact of 1929, 1929 Colo. Sess. Laws 548, 555, arts. 5-6; *see also*

and New Mexico to use, in equal proportions, the amount of any estimated spill from Elephant Butte Reservoir.[124]

The 1929 Temporary Compact remained in effect until June 1, 1935, by which time the parties were to agree on a final compact.[125] During the interim, data was collected to support final compact negotiations based upon 1929 river conditions.[126] The 1929 Temporary Compact criticized the United States for thrusting the burden of the 1906 Convention with Mexico on New Mexico, Texas, and Colorado. It also urged that only the United States' construction of the Closed Basin Drain and a large reservoir on the Rio Grande near the Colorado-New Mexico state line could alleviate this burden.[127] This complaint, at least from the upstream perspective, seemed misplaced, because it was the construction of Elephant Butte Reservoir to a size larger than needed to serve existing demands below San Marcial that placed the greatest burden on existing upstream water users.

In the 1929 Temporary Compact, Colorado and New Mexico also gave their consent to the construction of Caballo Reservoir below Elephant Butte Dam. This consent was subject to the condition that the reservoir's use would not be the basis of or give rise to any claim of appropriation or prior, preferred, or superior rights to use of the water so stored.[128]

The overriding problem facing the states in 1929 was the lack of comprehensive data on stream flows and the available water supply. In addition, both Colorado and New Mexico believed that the Rio Grande Project wasted as much as 200,000 acre-feet of water that upstream water users could put to beneficial use.[129] Thus, under the 1929 Temporary Compact, each state was required to establish stream gauging stations to collect data and to compile and deliver annual reports to each of the other states.[130] Additionally, New Mexico and Texas were required to collect data below Elephant Butte Reservoir to ascertain releases, flows, distribution, waste, and all other disposition of water for the Project. All parties agreed to do their best to prevent the waste of water.[131] In the view of Delph E. Carpenter:

Raymond A. Hill, *Development of the Rio Grande Compact of 1938*, 14 NAT. RESOURCES J. 163 (1974). This report supports the claims of Texas in *Texas v. Colorado*, 386 U.S. 901 (1967).

124. Rio Grande Compact of 1929, 1929 Colo. Sess. Laws 548, 555, art. 6. Article XI, made power generation subordinate to all other uses of water. This was done, in part, because the construction of Caballo Dam would allow year-round hydropower generation at Elephant Butte Dam without loss of irrigation water. *Id.* art. 6, at 558.

125. *Id.* at 556.

126. *Id.* art. 3, at 553-54.

127. *Id.* art. 2, at 550.

128. *Id.* art. 8, at 557.

129. *See, e.g.*, REPORT OF DELPH E. CARPENTER, COMMISSIONER FOR THE STATE OF COLORADO IN RE RIO GRANDE RIVER COMPACT 4 (1929) [hereinafter REPORT OF DELPH E. CARPENTER].

130. Rio Grande Compact of 1929, 1929 Colo. Sess. Laws 548, 552-55, arts. 3-4.

131. *Id.* arts. 3, 10, at 552-54, 558.

> The compact concludes a long period of interstate misunderstanding and threatened strife. It opens the way for an orderly and comprehensive development of the water resources of the Rio Grande in all three states without waste and without doing violence to the rights of either state. It preserves the autonomy of the states by state control before federal interference.[132]

The states twice extended the 1929 Temporary Compact, first from June 1, 1935, to June 1, 1937, and then from June 1, 1937, to October 1, 1937.[133] The first extension was made to allow the United States Natural Resources Committee to assist in compiling the data necessary for compact negotiations. The second extension was made to allow completion of negotiations on the final compact.[134] The 1929 Temporary Compact expired, but the negotiations proceeded until the parties signed the final Rio Grande Compact in Santa Fe, New Mexico, on March 18, 1938.[135]

V. THE RIO GRANDE COMPACT OF 1938

A. THE RIO GRANDE JOINT INVESTIGATION

When New Mexico, Colorado, and Texas signed the 1929 Temporary Compact, they only seemed to agree upon the fact that the Rio Grande lacked sufficient water to allow new depletions without equal amounts of "new" water added to the system.[136] Colorado believed it could develop additional storage to make its water supply parallel crop needs without injury to downstream states.[137] New Mexico and Texas feared that any new use in Colorado would create corresponding shortages for them.[138] At the same time, New Mexico pressed ahead with the rehabilitation and improvement of irrigation systems for the Middle Rio Grande Valley, including the proposed construction of El Vado Reservoir.[139] Texas viewed this latter activity with great apprehension.[140] The states thus hoped that the data they intended to develop before June 1, 1935, along with the construction of the Closed Basin Drain and a state-line reservoir, would provide a way around this impasse.

After the signing of the 1929 Temporary Compact, Colorado, New

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132. REPORT OF DELPH E. CARPENTER, *supra* note 129, at 8.

133. Act of Apr. 13, 1935, ch. 188, 1935 Colo. Sess. Laws 983; Act of Apr. 19, 1937, ch. 228, 1937 Colo. Sess. Laws 1056.

134. Act of Apr. 13, 1935, ch. 188, 1935 Colo. Sess. Laws 983; Act of Apr. 19, 1937, ch. 228, 1937 Colo. Sess. Laws 1056.

135. Rio Grande Compact, COLO. REV. STAT. §§ 37-66-101 to 102 (2001), 53 Stat. 785.

136. Rio Grande Compact of 1929, 1929 Colo. Sess. Laws 548, 555-59, arts. 5-6, 12; *see also* REPORT OF DELPH E. CARPENTER, *supra* note 129, at 2.

137. Littlefield, *supra* note 29, at 274-76.

138. *Id.* at 274-75.

139. *Id.* at 293-94.

140. *Id.*

Mexico, and various federal agencies independently conducted water supply investigations. Colorado's investigations largely focused on the amount of "new" water the drainage from the Closed Basin provided to the Rio Grande. New Mexico's investigations focused on stream depletions in Colorado and northern New Mexico. Texas apparently undertook no studies, and the Compact Administration compiled stream flow measurements and conducted several seepage studies.[141] The United States' studies evaluated the Closed Basin Drain, the Middle Rio Grande Project, and the canalization of the River below El Paso.[142]

Meanwhile, the Middle Rio Grande Water Conservancy District pressed ahead with its rehabilitation and drainage in the Middle Rio Grande Valley and the construction of El Vado Reservoir.[143] The federal government's Reconstruction Finance Corporation, which purchased the bonds issued to fund the project, enabled construction of the reservoir.[144] Texas was concerned that the construction of El Vado Reservoir would result in increased stream depletions and decreased water quality. Accordingly, Texas filed suit in 1935 against New Mexico and the Middle Rio Grande Water Conservancy District for violation of the 1929 Temporary Compact.[145] The lawsuit prompted the United States to recognize the conflicting roles of various federal agencies on the Rio Grande. The Bureau of Reclamation operated the Project to deliver water to irrigators in lower New Mexico, El Paso, Texas, and Juarez, Mexico. The State Department was responsible for implementing the 1906 Treaty with Mexico. The federal Reconstruction Finance Corporation had a stake in the success of the Middle Rio Grande Project.[146] And the United States had participated in the negotiation of the 1929 Temporary Compact. The existence of these conflicts, the potential for a federal violation of the 1929 Temporary Compact, and the stalled negotiations for a permanent compact prompted the United States to again impose a form of embargo on the use of public lands for water development.[147] In September 1935, President Franklin D. Roosevelt issued an executive order prohibiting any federal agency from approving applications for new projects involving use of waters of the Rio Grande without first securing an opinion on its advisability from the Natural Resources Committee.[148]

The year 1935 found Colorado, New Mexico, and Texas no closer to agreement on a permanent allocation of water than they had been in 1929. The Natural Resources Committee met with the Rio Grande

141. JOINT INVESTIGATION, *supra* note 1, at 9, 193-94; *see also* Littlefield, *supra* note 29, at 280-81.

142. JOINT INVESTIGATION, *supra* note 1, at 9, 193-94.

143. Littlefield, *supra* note 29, at 293.

144. *Id.* at 294.

145. Texas v. New Mexico, 296 U.S. 547 (1935); Hill, *supra* note 123, at 167-68.

146. Littlefield, *supra* note 29 at 294-295.

147. *Id.*

148. JOINT INVESTIGATION, *supra* note 1, at 7-10.

Compact Commission ("Compact Commission") to see if it might help resolve the impasse.[149] In December 1935, the Compact Commission agreed to an investigation by the Natural Resources Committee into (1) the water resources of the Rio Grande Basin above Fort Quitman; (2) past, present, and prospective water use and consumption in the basin; and (3) opportunities to conserve and augment the basin's water supply.[150] The study was undertaken to assist the Compact Commission in establishing a factual basis upon which the states could equitably apportion the Rio Grande. By late 1937, the Natural Resources Committee had completed its investigations and prepared a report commonly known as the Rio Grande Joint Investigation ("Joint Investigation"). The Joint Investigation is a comprehensive history and detailed analysis of surface and groundwater supplies and usage, agricultural water use practices and water demands, water quality, and opportunities for importation and storage of water throughout the basin. The Joint Investigation provided the states with complete information on all significant water uses and water resources in the basin as of 1937, and with this information, the states were able to negotiate a permanent compact.

On September 27, 1937, the Compact Commission held its first meeting after receiving the Joint Investigation. The meeting continued until October 1, 1937.[151] Between 1929 and the 1937 fall proceedings, the representatives of all of the parties had changed. Colorado's Compact Commissioner was now State Engineer M. C. Hinderlider, and his engineer advisor was Royce J. Tipton. The Commissioner for New Mexico was State Engineer Thomas M. McClure and his engineer advisor was John H. Bliss. Attorney Frank B. Clayton became the Texas Commissioner,[152] and his engineer advisor was Raymond A. Hill. Finally, S. O. Harper represented the United States and the United States' engineer advisor was E. B. Debler.

B. THE STATES' OPENING POSITIONS AT THE COMPACT NEGOTIATIONS

The Joint Investigation confirmed that the normal water supply of the basin was fully appropriated. The only means by which water use could increase were drainage, importation of water, or capture of flood flows that would otherwise spill from the Project. The Joint Investigation also concluded that the reservoir development in Colorado, creating a water supply that paralleled crop water demands, would benefit the entire basin. It concluded that (1) Colorado would

149. *See Proceedings of the Rio Grande Compact Commission held in Santa Fe, New Mexico, Mar. 3 and 4, 1937,* at 1 (on file with the United States Archives); *see also Sixth Annual Report of the Rio Grande Compact Committee,* (1936) (on file with the Denver Public Library).

150. JOINT INVESTIGATION, *supra* note 1 at 10.

151. *Proceedings of the Meeting of the Rio Grande Compact Commission held in Santa Fe, New Mexico, Sept. 27 to Oct. 1, 1937* [hereinafter *1937 Fall Proceedings*] (on file with the United States Archives).

152. Frank Clayton was also the attorney representing the State of Texas in *Texas v. New Mexico.* Hill, *supra* note 123, at 173.

use less water; (2) increased return flows from Colorado would enhance water supplies in New Mexico; and (3) such storage would have no adverse impact on the Project.[153]

At the first meeting, each state set forth its basic position on the terms for the permanent compact.[154] Colorado's position was that the water supplies in the basin were adequate, if properly regulated, to meet the requirements of the existing irrigation development.[155] Colorado also believed that the facilities in place in both the Middle Rio Grande and the Elephant Butte to Fort Quitman section were able to provide a perfect irrigation supply except during prolonged droughts.[156] Since periods of prolonged drought were infrequent, Colorado asserted that it was uneconomical to provide additional storage for such droughts.[157] The embargo, on the other hand, had denied Colorado the opportunity to construct reservoirs that would make its water supply parallel irrigation water demands.[158] Thus, Colorado maintained that any compact must permit it to construct reservoirs in order to place its water users on an equal footing with those in the Middle Rio Grande and those under the Project.[159] Colorado also maintained that such reservoir development would improve the water supply in the Middle Rio Grande and leave the Project's water supply unaffected.[160]

New Mexico, for its part, was willing to permit increased storage in Colorado on the conditions that; (1) the compact protected New Mexico water uses; and (2) the San Juan-Chama transmountain diversion project was completed at the same time as new storage in Colorado.[161] New Mexico was willing to negotiate with Texas to protect Texas citizens the Project served by fixing the amount of water the Project could receive, provided that Mexico was limited to 60,000 acre-feet annually upon construction of the American canal.[162] New Mexico also required that (1) the Middle Rio Grande Water Conservancy District could irrigate 123,000 acres; (2) Colorado and Texas recognize and assure an adequate supply for all existing water users in New Mexico; and (3) the compact provide New Mexico the right to construct any and all flood protection works necessary to safeguard property in New Mexico.[163] Apart from the latter demand, New Mexico made no specific requests for its Project lands.

For its part, Texas was willing to forego any benefit from efforts to augment the supplies of the River on two conditions; (1) that

153. JOINT INVESTIGATION, *supra* note 1, at 17-18.
154. *1937 Fall Proceedings*, *supra* note 151, at 54-65.
155. *Id.* at 10, 54.
156. *Id.* at 11, 54.
157. *Id.*
158. *Id.*
159. *1937 Fall Proceedings*, *supra* note 151, at 11, 56.
160. *Id.* at 10-11, 55.
161. *Id.* at 12, 59.
162. *Id.*
163. *Id.* at 12-13, 63.

Colorado and New Mexico deliver sufficient water at San Marcial to provide 800,000 acre-feet annually for the Project; and (2) that the quality of the water so delivered not decline below the average quality during the preceding ten years.[164] Texas did not seek to separate its rights from the water delivered to Project lands in New Mexico and Texas.

After the states presented their preliminary positions, each state then submitted its proposal for the basis of a compact. Colorado proposed a schedule of deliveries at the state line based on the relationship of the combined inflow of the River at Del Norte and the Conejos River at Mogote and the resulting outflow at Lobatos (near the state line) occurring during 1928-1937 ("Compact Study Period").[165] The proposed schedule did not require specific amounts on an annual basis, but rather permitted credits and debits to accrue over a period of years subject to certain conditions.[166] The conditions included, among others, (1) any accrued debits in excess of unfilled Project Storage be "written-off"; (2) accumulated credits be reduced by the amount of spills from Project Storage; (3) the mean annual release from Project Storage would be 750,000 acre-feet; (4) Colorado's accrued debits be reduced by the amount that releases from Project Storage exceeded 750,000 acre-feet annually; (5) when Project Storage was less than 300,000 acre-feet, Colorado would release water equal to its debit from reservoirs constructed after completion of the final compact; and (6) new reservoirs would not impair the flow at Lobatos when the flow at Otowi Bridge (near San Ildefonso, New Mexico) was insufficient to supply the needs of the Middle Rio Grande Water Conservancy District as defined in the Joint Investigation.[167]

In addition, Colorado wanted to deduct from the recorded flow at Del Norte or Mogote any water imported into those areas after October 1, 1937.[168] Colorado also sought a share of any water imported into the Rio Grande in New Mexico from streams in Colorado in the form of a credit to its scheduled state line delivery.[169] Finally, Colorado asked that its scheduled state line delivery not become effective until the new storage in Colorado was fully operative.[170]

New Mexico proposed a schedule for Colorado's state line deliveries based solely upon measured inflow at Del Norte and corresponding outflows at Lobatos.[171] It proposed that deliveries be computed on a sixty-month running average, and that Colorado's deliveries at Lobatos could not fall below 25 percent of the inflow at

164. *1937 Fall Proceedings, supra* note 151, at 13.
165. *Id.* at 31-33, 61.
166. *Id.*
167. *Id.* at 32.
168. *Id.* at 32-33.
169. *1937 Fall Proceedings, supra* note 151, at 33.
170. *Id.*
171. *Id.* at 63.

Del Norte in any consecutive twelve months.[172] New Mexico also proposed that Colorado's deliveries between June 15 and September 15 never drop below 100 c.f.s, and that Colorado's schedule of deliveries exclude any drainage from the Closed Basin.[173]

Texas did not propose state line deliveries by Colorado, choosing instead to rely upon New Mexico's proposal. Texas did, however, propose a schedule of deliveries to Elephant Butte Reservoir based upon an inflow-outflow relationship using the natural runoff at Otowi originating in New Mexico over sixty consecutive months.[174] The Texas schedule assumed that as natural inflow from New Mexico increased, total inflow at Otowi would increase as well.[175] Thus, for all five-year cumulative flows of 2,000,000 acre-feet or less, New Mexico would deliver to San Marcial an amount equal to the Otowi inflow. When five-year cumulative inflows at Otowi exceeded 2,000,000 acre-feet, required deliveries at San Marcial exceeded Otowi inflow by an increasing percentage of Otowi inflow.[176] Texas proposed no time frame for delivery, but did seek to prohibit upstream storage from exceeding 30 percent of Project Storage at any given time.[177] Texas also proposed to increase the scheduled deliveries by 5 percent for each 10 percent increase above 0.7 tons per acre-foot average dissolved solids in the water delivered. Finally, Texas proposed that the sixty consecutive months for calculation of deliveries end whenever all reservoirs on the Rio Grande between San Marcial and Fort Quitman were filled.[178] The next sixty-month period would begin when water users once again withdrew from those reservoirs for irrigation.[179]

After lengthy discussions of the respective states' proposals, the Compact Commission referred the proposals to its Committee of Engineers ("Engineer Advisors") composed of the engineering consultant for each state (Royce J. Tipton for Colorado, John H. Bliss for New Mexico, Raymond A. Hill for Texas and E. B. Debler for the United States). The Compact Commission directed the Engineer Advisors to reconcile differences in basic data, attempt to develop a technical basis for a compact, and endeavor to work out delivery schedules.[180] The Compact Commission also instructed the Engineer Advisors that their work was to be guided by the principle that present legitimate uses in each part of the basin were to be protected against any injury from development in other parts of the basin because the usable water supply was no more than needed to satisfy the present uses.[181]

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172. *Id.*
173. *Id.*
174. *1937 Fall Proceedings, supra* note 151, at 64-65.
175. *Id.* at 64.
176. *Id.*
177. *Id.*
178. *Id.*
179. *1937 Fall Proceedings, supra* note 151, at 64.
180. *Id.* at 53.
181. C.L. PATTERSON, ANALYSIS OF REPORT OF COMMITTEE OF ENGINEERS TO RIO

C. THE DECEMBER 27, 1937 REPORT OF THE COMMITTEE OF ENGINEERS (THE "FIRST REPORT")

The Engineer Advisors met in November and December of 1937. They first devoted their attention to the factors affecting discharge of the Rio Grande at the Colorado-New Mexico state line and the delivery of water into Elephant Butte Reservoir. Second, they addressed the development of definite delivery schedules.[182] The Engineer Advisors based the proposed Colorado delivery schedule on a mathematical curve representing the relationship between the combined inflows of the Rio Grande and the Conejos (including the San Antonio and Los Piños Rivers) and the outflow of the Rio Grande at Lobatos.[183] Noting that future reservoir construction could disturb the relationship between inflow and outflow, the Engineer Advisors prepared separate delivery schedules for the Rio Grande and the Conejos Rivers.[184] This was done to automatically account for variations in the discharge of the two streams, and to allow San Luis Valley water users to apportion among themselves their relative responsibility for meeting the Colorado obligation.[185]

The Conejos River's proposed annual index (inflow) supply was the sum of the Conejos River's inflow measured at Mogote and the Los Piños and San Antonio Rivers' inflow measured near Ortiz, New Mexico.[186] The Conejos River's confluence with the Rio Grande near Los Sauces was to serve as the measuring point for the Conejos River's scheduled deliveries.[187] As inflow increased, the amount of delivered water required at Los Sauces also increased, with the difference between inflow and scheduled delivery being the allowable depletions. Thus, when inflow measured less than 100,000 acre-feet, the Conejos River had no scheduled delivery, while an index flow of 350,000 acre-feet resulted in a scheduled delivery of 150,000 acre-feet.[188] The Conejos River's index supply ended at 700,000 acre-feet for which the scheduled delivery was 480,000 acre-feet.[189]

The Engineer Advisors constructed the proposed schedule for the Rio Grande in a similar fashion, calling for a scheduled delivery of 60,000 acre-feet on an index flow of 200,000 acre-feet. When index flows reached 700,000 acre-feet, the scheduled delivery increased to 204,000 acre-feet.[190] The Rio Grande's allowable depletions reached a maximum of 570,000 acre-feet on index flows of 1,000,000 acre-feet

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GRANDE COMPACT COMMISSIONERS (1937) [hereinafter FIRST REPORT OF ENGINEER ADVISORS] (on file with the United States Archives).

182. *Id.* at 3.
183. *Id.*
184. *Id.*
185. *Id.* at 3-4.
186. FIRST REPORT OF ENGINEER ADVISORS, *supra* note 181, at 3.
187. *Id.* at 3-4.
188. *See generally id.*
189. *See generally id.*
190. *See generally id.*

and at greater index flows, allowable depletions declined to 560,000 acre-feet.[191] The Rio Grande's actual deliveries were to be computed as the flow of the Rio Grande at Lobatos, less the flow of the Conejos River at Los Sauces.[192] The Engineer Advisors also proposed that Colorado index flows be adjusted to account for both water imported above the inflow index stations and new depletions above these stations.[193]

The consistent relationship the Engineer Advisors found between inflows at upper index stations and outflows at lower index stations in Colorado did not hold true in New Mexico. This was primarily due to erratic tributary inflow,[194] resulting from summer thunderstorms. Only by eliminating the months of July, August, and September could the Engineer Advisors find a reasonable relationship between the stream flow at Otowi Bridge and the inflow to Elephant Butte Reservoir.[195] The Engineer Advisors believed that no practical location for a gauging station above Elephant Butte Reservoir existed, so they adjusted the curve to compensate for stream losses between San Marcial and Elephant Butte Reservoir.[196] Then, the curve was "arbitrarily shifted to compensate for increased salinity of the Elephant Butte supply."[197] The result was a nine month schedule of deliveries requiring a certain quantity of water to reach Elephant Butte Reservoir for any given quantity of measured inflow at Otowi.[198] Thus, an inflow of 100,000 acre-feet at Otowi required 12,000 acre-feet to reach Elephant Butte Reservoir.[199] New Mexico's allowable depletions to Otowi inflow increased to 375,000 acre-feet on inflows of 1,200,000 acre-feet, but declined at higher inflows such that an index flow of 2,200,000 acre-feet at Otowi required a delivery of all inflow plus an additional 24,000 acre-feet to Elephant Butte Reservoir.[200] The deliveries to Elephant Butte Reservoir, the "Elephant Butte Effective Supply," was computed as all releases from the reservoir, plus any gain in storage, minus any draft on storage during the same time period.[201]

The Engineer Advisors recognized that natural variations would occur in the relationships underlying both the Colorado and the New Mexico delivery schedules. Furthermore, reservoir construction could cause departures from the scheduled deliveries.[202] To account for the natural variations, the Engineer Advisors proposed to allow Colorado

191. The allowable depletion is the difference between the inflow measured at the upper index station and the scheduled delivery at the lower index station.
192. FIRST REPORT OF ENGINEER ADVISORS, *supra* note 181, at 3.
193. *Id.*
194. *Id.* at 4.
195. *Id.* at 9.
196. *Id.*
197. FIRST REPORT OF ENGINEER ADVISORS, *supra* note 181, at 9.
198. *Id.* at 9-10.
199. *See generally id.*
200. *See generally id.*
201. *Id.* at 10.
202. FIRST REPORT OF ENGINEER ADVISORS, *supra* note 181, at 11-12.

to accrue debits of up to 100,000 acre-feet and New Mexico to accrue debits of up to 200,000 acre-feet.[203] The states could not accrue debits in excess of those amounts unless caused by water carried over in reservoirs, and an amount of water equal to the additional debit was retained in storage.[204] For Colorado, the additional debit was for water stored in reservoirs constructed above Lobatos after 1937, and in the case of New Mexico, it applied to all reservoirs constructed after 1929, so as to include El Vado Reservoir.[205]

The First Report then turned to other protections of the Project from the effect of new upstream storage and the protection of upstream users against waste or enlarged use of Project water. Thus, the First Report defined and limited the quantity of Project Storage to 2,638,860 acre-feet. In addition, it limited the geographic location of Project Storage to Elephant Butte Reservoir and all other downstream reservoirs available to store Project water above Courchesne (just upstream of El Paso).[206] The Engineer Advisors set the normal release of Project water at 800,000 acre-feet, including the 60,000 acre-foot treaty obligation to Mexico.[207]

In 1937, the El Paso District diverted its water from the Rio Grande both above and below the Acequia Madre, where Mexico diverted its 60,000 acre-feet.[208] Since this allowed unauthorized diversions by Mexico below the Acequia Madre, diversions serving Project lands below that point required additional releases from Project Storage to meet irrigation demands.[209] Mexico's unauthorized diversions were as much as 70,000 acre-feet annually.[210]

To account for changes in Mexico's unauthorized diversions, the Engineer Advisors proposed to increase or decrease the 800,000 acre-feet normal release by two-thirds of any change in aggregate diversions or loss to Mexico between Courchesne and the lowest point of diversion to Project lands.[211] The basis for the future adjustments was the average loss due unauthorized diversions by Mexico from 1928 through 1937.[212] In other words, Project Storage carried the burden or benefit of changes in Mexico's unauthorized diversions. The burden was not passed upstream to Colorado or New Mexico in the form of an increased or decreased delivery requirement. Mexico's changes in unauthorized diversion did, however, affect Colorado and New Mexico. The Engineer Advisors went on to recommend that if a change in the "normal release" was made due to a change in unauthorized diversions by Mexico, then Colorado and New Mexico

203. *Id.*
204. *Id.*
205. *Id.*; *see* Hill, *supra* note 123, at 188 (explaining significance of the dates).
206. FIRST REPORT OF ENGINEER ADVISORS, *supra* note 181, at 11.
207. *Id.*
208. JOINT INVESTIGATION, *supra* note 1, at 99-101.
209. *Id.* at 101.
210. *Id.*
211. FIRST REPORT OF ENGINEER ADVISORS, *supra* note 181, at 11.
212. *Id.*

would share equally therein.[213] To do so, the accrued credits or debits of each state were to be adjusted in proportion the change in unauthorized diversions or loss to Mexico.[214]

The predicate of the Compact negotiations was that new upstream uses would be possible only to the extent that (1) new water was introduced into the Rio Grande; or (2) by the upstream storage of water that otherwise would have spilled from Project Storage and would not have been diverted by Project water users. To this end, the Engineer Advisors defined "usable water" as all water in Project Storage available for release in accordance with irrigation demand, including the 1906 Treaty obligation to Mexico.[215] They defined an "unusable spill" as the amount of water spilled from Elephant Butte Reservoir for flood control in excess of the current irrigation demand of Project lands and not stored in another reservoir for subsequent release to meet such irrigation demands.[216] An unusable spill eliminated all debits of Colorado and New Mexico, thus allowing those states free use of so called "debit water" previously stored in reservoirs constructed after 1929.[217]

In order to protect Colorado and New Mexico against the effect of actual releases from Project Storage in excess of 800,000 acre-feet annually, the Engineer Advisors proposed to adjust the time of occurrence of an unusable spill by the difference between the total actual releases and the accrued normal release.[218] In other words, if total actual releases exceeded the quantity of the normal releases during the time since the last spill of Project Storage, excess releases, combined with the contents of Project Storage, would be used to determine the occurrence of unusable spills. This way Project water users could not benefit from overuse of Project water.

To implement the upstream use of all water that otherwise would have spilled from Project Storage, the Engineer Advisors recommended a reduction in the accrued debits of Colorado and New Mexico whenever those debits exceeded the unfilled capacity of Project Storage.[219] The rationale for this provision is the fact that an unusable spill of Project Storage would have occurred had Colorado and New Mexico not incurred the debits. Thus, the First Report recommended proportional reduction of Colorado and New Mexico's debits when their combined debits exceeded the unfilled capacity of Project Storage.[220] This allowed the upstream states the free use of such debit water stored in post-1929 reservoirs that otherwise would

213. *Id.* at 10.
214. *Id.* at 10-13.
215. *Id.* at 11.
216. FIRST REPORT OF ENGINEER ADVISORS, *supra* note 181, at 10.
217. *Id.*
218. *Id.* at 11-13.
219. *Id.* at 10-13.
220. *Id.*

have spilled from Project Storage.[221]

The First Report also recognized that in some years, Colorado and New Mexico would deliver greater quantities than required due to natural variations in stream flow, and those states should receive credit for the over-deliveries.[222] Texas, however, was concerned that large annual credits would threaten Project water supplies. Accordingly, the Engineer Advisors recommended that Colorado not accrue credits in excess of 100,000 acre-feet unless the larger accruals offset debits caused by storage in post-1929 reservoirs.[223] The Engineer Advisors recommended limiting New Mexico's accrued credits to 200,000 acre-feet.[224] In computing accrued credits or debits, they recommended limiting both Colorado and New Mexico to a maximum annual credit of 150,000 acre-feet even if the actual credit was greater.[225] The latter provision had the effect of limiting both states' ability to accrue large debits in the expectation of using large annual credits in flood years to eliminate accrued debits.

To protect the Project, the Engineer Advisors recommended that at times of an unusable spill, the aggregate credits of Colorado and New Mexico be reduced by the amount of the spill in proportion to their respective credits.[226] Additionally, the First Report recommended that the states could not accrue credits in a year when a spill occurred. This resulted in credit water being the first to spill, leaving Project water unimpaired.

The timing and quantity of upstream storage could directly affect the quantity of water stored in Elephant Butte Reservoir. To ensure Elephant Butte Reservoir contained sufficient water for Project needs, the Engineer Advisors recommended prohibiting Colorado and New Mexico from increasing storage in reservoirs constructed after 1929 when Project Storage was less than 400,000 acre-feet.[227] If Project Storage declined to that minimum by January 1 of any year, Colorado and New Mexico could be required to release, at the greatest practical rate, all water from reservoirs equal to the total debit of each caused by the storage of such water.[228]

The First Report largely ignored questions of water quality and Texas' demand to reduce delivery credits as total dissolved solids in the water increased. The Engineer Advisors did, however, suggest minimum quality requirements of any water added to the Rio Grande from the Closed Basin in Colorado. In order for Colorado to receive credit for such water, the portion of sodium ions had to be less than 45

221. FIRST REPORT OF ENGINEER ADVISORS, *supra* note 181, at 11.
222. *Id.* at 4, 10-13.
223. *Id.* at 12.
224. *Id.* at 13.
225. *Id.* at 12-13.
226. FIRST REPORT OF ENGINEER ADVISORS, *supra* note 181, at 10-13.
227. *Id.* at 14.
228. *Id.*

percent of the total positive ions in the water.[229]

The Engineer Advisors recommended that the First Report be the basis for an apportionment of the Rio Grande among Colorado, New Mexico above Elephant Butte Reservoir, and New Mexico and Texas from Elephant Butte Reservoir to Fort Quitman.[230] The First Report, with some important modifications, did provide the fundamental framework for further negotiation of the Rio Grande Compact.

D. COLORADO'S ANALYSIS OF THE FIRST REPORT

In February 1938, Royce Tipton submitted to M.C. Hinderlider his report titled "Analysis of Report of Committee of Engineers to Rio Grande Compact Commission, Dated December 27, 1937."[231] The report contained Tipton's analysis of the effect of a compact containing the Engineer Advisor's recommendations on present and prospective water use in the San Luis Valley. Tipton concluded that if his recommended modifications were also included in the proposed compact, then a compact based upon the First Report:

> [W]ould not interfere with present use of water in the San Luis Valley and would permit practically free operation of reservoirs, with present drainage facilities. With more adequate drainage, water users in the San Luis Valley would be free to increase water uses to the maximum extent physically and economically feasible.[232]

Tipton noted that the First Report closely followed Colorado's compact proposal in Santa Fe on October 1, 1937. That report preserved the present use of water and permitted increased diversion and consumption of water that otherwise would have spilled from Elephant Butte Reservoir. Using a delivery schedule for Colorado based upon conditions existing from 1928 to 1937, and a delivery schedule to Elephant Butte Reservoir based upon the period 1915 to 1937 would accomplish this goal.[233]

Tipton felt the Colorado schedule of state line deliveries the Engineer Advisors proposed was more favorable to Colorado than any other proposed schedule, and its adoption would not interfere with Colorado's present water use. He also believed the First Report would permit the free operation of Wagon Wheel Gap Reservoir on the Upper Rio Grande near Creede, Colorado, to provide an annual diversion of at least 650,000 acre-feet except in prolonged droughts.[234] This, in turn, allowed the water supply to parallel irrigation demand.

For the Conejos River, Tipton believed diversions could be made

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229. *Id.*

230. *Id.* at 13-14.

231. R.J. TIPTON, ANALYSIS OF REPORT OF COMMITTEE ENGINEERS TO RIO GRANDE COMPACT COMMISSIONERS (1938) (on file with Colorado Division of Water Resources).

232. *Id.* at i.

233. *Id.* at 6.

234. *Id.* at 7-9.

as in the past, since the schedule for the Conejos River was based upon actual operations since 1924. He also thought that to provide a well-regulated supply on the Conejos River, very little carry-over storage was necessary because its annual stream flow did not vary greatly from the mean. In fact, Tipton believed that reservoir regulation of the Conejos water supply might actually decrease consumption.[235]

Tipton reported that fixing the normal release from Elephant Butte Reservoir was quite controversial. Colorado felt that 750,000 to 775,000 acre-feet was adequate. He pointed out that the Joint Investigation fixed the demand at 736,000 acre-feet or 773,000 acre-feet, depending upon the method of analysis. Tipton also noted that the Rio Grande Joint Investigation concluded that Mexico's diversions averaged 130,000 acre-feet and, reducing that amount to 60,000 acre-feet, saved 70,000 acre-feet. Under the terms of the First Report, the normal release, reduced by two-thirds of the 70,000 acre-foot savings (approximately 46,600 acre-feet), resulted in a normal release of 753,000 acre-feet, very nearly the 750,000 acre-feet Colorado previously proposed.[236] On the other hand, if Mexico's diversions increased, the normal release would supply one-third of the increase, and water that otherwise would have spilled from Elephant Butte Reservoir supplied the balance.[237]

Upon further reflection, Tipton no longer agreed with the Engineer Advisors' recommendation that Colorado and New Mexico release debit water when Elephant Butte Reservoir storage fell below 400,000 acre-feet. Instead, he felt that a release of all the water might serve to increase the next spill of Elephant Butte Reservoir without Colorado and/or New Mexico having the opportunity to capture the water in upstream storage. Tipton recommended limiting those releases to only the amount needed to prevent a shortage to Project water users.[238]

Tipton was also concerned that Colorado's allowable debit of 100,000 acre-feet was too little. While he thought that 100,000 acre-feet was ample based upon stream flows between 1915 and 1937, a study of stream flows from 1890-1937 showed more might be required. Tipton concluded that from 1890-1914, the proposed schedule would have caused Colorado to accrue a debit of 150,000 acre-feet in 1907 and 1908, assuming no spill of Elephant Butte Reservoir. He added that if a spill had occurred, at least in 1905, it would have eliminated an accrued debit of 90,000 acre-feet. Tipton, however, was a careful engineer, and when he eliminated the large water years of 1890 and 1891 from consideration, Colorado's accrued debit reached 210,000 acre-feet in 1907, and would reach 110,000 acre-feet by the end of 1904. Although Tipton thought the allowable debit of 100,000 acre-feet, when coupled with the predicted spill of Elephant Butte

235. *Id.* at 42-43.
236. TIPTON, *supra* note 231, at 11, 46-50.
237. *Id.* at 12, 46-50.
238. *Id.* at 12-13, 50-52.

Reservoir, was ample to protect Colorado's water users, he recommended increasing Colorado's allowable debit to 200,000 acre-feet. He recommended, however, that an increase in the allowable debit not result in more use of natural flow than was occurring at the present time. Rather, the increase of the allowable debit was to prevent the San Luis Valley from bearing the burden of debits that would naturally accrue during a succession of high and low water years comparable to the 1890-1905 period.[239]

Tipton's report also contained an extensive analysis of how the proposed Wagon Wheel Gap Reservoir could operate under the Engineer Advisor's recommended compact provisions. Tipton evaluated the proposed reservoir's operations under six different sets of assumptions concerning water supply and return flows.[240] Under the most adverse assumptions, Wagon Wheel Gap Reservoir could sustain annual diversions of 650,000 acre-feet for each year 1905 to 1934 and could provide 220,000 acre-feet more water in 1934 than the natural flow in that year. He also noted that with an additional supply of 26,000 acre-feet annually from imported water, increased return flows, or a reduction in deliveries to Mexico, Wagon Wheel Gap Reservoir could have operated freely through 1937.[241]

Based upon his analysis, Tipton concluded that the Engineer Advisor's recommendations would permit construction of Wagon Wheel Gap Reservoir and its use to make the Rio Grande's water supply would more nearly parallel to crop water requirements, without injury to New Mexico or Texas. Tipton was also careful to point out that even during times when Colorado was unable to store carry-over water, it would still receive substantial benefit from regulating the existing water supply to provide better use. Thus, Tipton believed that notwithstanding the proposed limitations on carry-over storage the First Report recommended, reservoirs constructed after 1929 could continue to be used for seasonal regulation of existing water rights, allowing supply to parallel demand.[242]

Tipton did not analyze the impact of the First Report's recommendations on reservoir construction on the Conejos River, believing that free operation of reservoirs on the Conejos River would not disturb the conditions reflected in its schedule of deliveries. He stated that seasonal regulation through reservoirs was the Conejos area's principal need, not reservoirs for carry-over storage. Accordingly, the Conejos River would not accrue larger debits over several years by withholding substantial amounts of floodwater in reservoirs.[243]

Tipton concluded his report with a series of recommendations for

239. *Id.* at 13-29.
240. *Id.* at 29-41.
241. TIPTON, *supra* note 231, at 35-36.
242. *Id.* at 9, 35-40.
243. *Id.* at 42-43.

changes to the First Report.[244] Tipton's report and recommendations were provided to C. L. Patterson, the Chief Engineer for the Colorado Water Conservation Board, in March 1938. Mr. Patterson then submitted his comments on the First Report to the Colorado Water Conservation Board. Of significance for present purposes is Patterson's evaluation of the proposed schedules of deliveries for the Rio Grande and the Conejos River. Patterson agreed that the schedule of deliveries for the Rio Grande would protect existing levels of use, and perhaps allow for limited increased usage.[245] Patterson was not as sure, however, that the proposed schedule of delivery for the Conejos River would protect existing levels of use. He pointed out that had the proposed Conejos schedule been in effect from 1925-1936, the Conejos River would have incurred an average annual debit of 3,800 acre-feet.[246] From this, he concluded that if 1925-1936 was representative of long-term conditions, then the Conejos would have exceeded its allowable development, requiring some reduction in usage.[247] Further, he noted that Conejos stream flows from 1925-1936 were only 95 percent of the forty-eight year average, and that corresponding records of outflow over that period did not exist.[248] Apparently, Patterson's intended conclusion was that the Conejos River schedule contained little or no excess. Patterson's analysis did not include 1937, a comparatively wet year. Adding that year to the analysis, along with the minor adjustments to the Conejos River's schedule of deliveries the Engineer Advisors recommended later,[249] allowed continuation of the 1924-1937 levels of uses.

E. PROCEEDINGS OF THE RIO GRANDE COMPACT COMMISSION, MARCH 3 TO MARCH 18, 1938

The Middle Rio Grande Water Conservancy District immediately objected to the First Report. In a letter dated January 25, 1938, to U.S. Representative S. O. Harper, Thomas McClure, New Mexico's Compact Commissioner, stated the report was unacceptable as the basis for further compact negotiations. He objected primarily to the recommended schedule of deliveries to Elephant Butte Reservoir and the recommended quantity of normal releases for the Project. He therefore requested that the Engineer Advisors reconsider their report.[250] The Compact Commissioners agreed to take up Mr. McClure's objections at their meeting scheduled for March 1938.[251]

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244. *Id.* at 52-55. Those recommendations included matters not discussed here.

245. FIRST REPORT OF ENGINEER ADVISORS, *supra* note 181, at 4-5.

246. *Id.* at 5.

247. *Id.*

248. *Id.* at 5-6.

249. *Proceedings of the Meeting of the Rio Grande Compact Commission Held at Santa Fe, New Mexico, March 3 to March 8, 1938* [hereinafter *1938 Proceedings*] (on file with the United States Archives).

250. *Id.* at 48.

251. *Id.* at 54-55.

When the Compact Commission convened on March 3, 1938, in Santa Fe, New Mexico, both the Colorado and Texas Commissioners indicated their willingness to proceed with negotiations based on the First Report.[252] In light of New Mexico's unwillingness to do so, the Commissioners asked New Mexico to provide a written statement of its objections.[253] New Mexico's statement contained eleven specific objections that the Compact Commission returned to the Engineer Advisors. On March 4, 1938, the Engineer Advisors reported that they were willing to review all but three of the issues New Mexico raised, and needed two to three days to do so.[254] To expedite the review, and to provide additional information, the engineer for the Middle Rio Grande Water Conservancy District became an informal participant in the ensuing discussions.

The issues reviewed by the Engineer Advisors included (1) whether to base New Mexico's deliveries on the relationship between inflow at Otowi and outflow at San Marcial; (2) whether to include El Vado storage in natural flows at Otowi; (3) whether a normal release of 800,000 acre-feet from Project Storage was excessive; (4) New Mexico's insistence on establishing an exact figure for Mexico's excess diversions as the basis for determining credit for future savings; (5) fixing the maximum capacity of Project Storage based upon an elevation in Elephant Butte Reservoir; (6) retention of credit water under certain conditions; (7) inclusion of provisions to prevent premature release of debit water to Project Storage; and (8) inclusion of releases of water for power generation in the "normal releases" from the Project.[255] The Engineer Advisors left to the Compact Commission as a whole New Mexico's demands that it not be charged with water usage by Indian pueblos, that the obligation for fulfilling the treaty obligation be placed expressly on Texas or the United States, and that there be no legal interpretation of the 1906 Treaty obligation.

F. SECOND REPORT OF THE ENGINEER ADVISORS

After extensive deliberations, on March 9, 1938, the Engineer Advisors submitted their revised recommendations for the basis of the compact ("Second Report"). The Second Report followed the same language and format of the First Report, varying only when recommendations changed.[256] Since the Engineer Advisors held all of their meetings off the record, no written documents exist explaining their bases or reasons for the changes.

The first substantive change was a new schedule of deliveries for New Mexico based upon inflow at Otowi and outflow at San Marcial exclusive of July, August, and September. The new Otowi index supply included an adjustment for upstream storage. This change meant that

252. *Id.* at 3, 4-5.
253. *Id.* at 5, 13-14.
254. *1938 Proceedings, supra* note 249, at 12-15, 56-57.
255. *Id.* at 13-14.
256. *Id.* at 58-65.

Otowi inflow did not include El Vado water until it was released from storage, usually between July and September. This new schedule was subject to adjustment for post-1929 depletions to the natural runoff above Otowi, and depletions caused by works constructed after 1937 between Otowi and San Marcial.[257]

The Engineer Advisors remained quite skeptical about the use of a gauging station at San Marcial, fearing it would not remain viable. Thus, they recommended maintaining gauging stations upstream at San Acacio and downstream below Elephant Butte Reservoir. This would enable data collection from these stations if it became necessary to adopt a substitute schedule.[258]

The second substantive change the Engineer Advisors recommended was reduction of Colorado's state line delivery obligation at Lobatos by 10,000 acre-feet.[259] The Second Report does not explain the reason for this change. Raymond Hill attributed it to a dispute between Rio Grande and Conejos River interests in Colorado.[260] Alternatively, C. L. Patterson's concerns about the tightness of the Conejos River schedule could be a reason for the change. Yet, neither explains why Project water users would give up 10,000 acre-feet annually to solve an intramural dispute in Colorado. The answer to the latter question appears to be part of a larger compromise involving over-diversions by Mexico and the "normal release" from Project Storage.

The Engineer Advisors had agreed to consider New Mexico's objections to both the amount of the "normal release" from Project Storage and the need for greater specificity in allocation among the states of the savings from Mexico's reduced over-diversions.[261] In the Second Report, the Engineer Advisors reduced the "normal release" to 790,000 acre-feet, which included the 60,000 acre-foot treaty obligation.[262] In addition, they eliminated from the definition of "normal release from Elephant Butte" any provision for sharing either in the benefit of Mexico's reduced over-diversions or in the burden of increased deliveries to Mexico.[263] This issue was important to Colorado. Tipton believed that reducing Mexico's over-diversions would result in savings up to 70,000 acre-feet, Colorado's share of the savings being one-third or 23,300 acre-feet.[264] This savings would reduce the "normal release" to approximately 753,000 acre-feet.[265] Reduced annual releases from Project Storage would then increase the potential for spills, and thus improve the water supply in Colorado.

257. *Id.* at 62.
258. *Id.* at 64-65.
259. *1938 Proceedings, supra* note 249, at 60.
260. Hill, *supra* note 123, at 177.
261. *1938 Proceedings, supra* note 249, at 56-57.
262. *See generally id.*
263. *Id.* at 62-63.
264. TIPTON, *supra* note 231, at 47.
265. *Id.*

Since this was nearly enough water to allow the free operation of Wagon Wheel Gap Reservoir,[266] Colorado would not readily give up its share in the reductions of Mexico's over-diversions.

Raymond Hill later testified that the three states could not agree on how Colorado and New Mexico should share in any savings from reduced deliveries to Mexico.[267] According to Mr. Hill, the upper states said "'If you want to let them [Mexico] have more water, it is your water and it is your baby, don't bother us with it'."[268] He also testified that the allocation on the downstream side of Elephant Butte was 730,000 acre-feet for use in the United States and 60,000 acre-feet for use in Mexico. If Mexico used more than 60,000 acre-feet, it came out of the 730,000 acre-feet.[269] Mr. Hill's testimony is consistent with Article XIV of the Compact, providing that the schedules of deliveries and quantities of water the Compact allocated shall never increase or decrease due to any increase or decrease in delivery or loss of water to Mexico.

The compromise on the Mexican deliveries clarifies why the Project water users were willing to reduce the normal release by 10,000 acre-feet. The compromise, in effect, gave the Project water users most of the savings resulting from Mexico's reduced over-diversions. The American Canal, nearing completion, would reduce Mexico's over-diversions, thereby increasing the Project water supply. Thus, the compromise on over-diversions by Mexico is the apparent source of the 10,000 acre-foot reduction in Colorado's scheduled deliveries. While Colorado was willing to give up some portion of the savings from Mexico's reduced over-diversions, it apparently was not willing to give it all up.

This also helps explain why New Mexico receded from its claim that the 800,000 acre-feet "normal release" was so unreasonable as to fail as a basis for negotiations. In effect, the states all agreed that Project water users would bear the risk of increased water losses to Mexico, and Colorado received a small reduction in annual scheduled deliveries as part of the bargain.

The Second Report made a number of other less dramatic changes to the First Report. It modified the provision for credits and debits to include assessment of evaporation losses against credit water in Project Storage. In accordance with Tipton's recommendation, the Second Report also reduced the requirement for releases of debit water stored upstream to the amount necessary to increase Project Storage to 600,000 acre-feet by March 1, and maintain that level until April 13. Finally, recognizing the uncertainty of several factors, the Engineer Advisors left the effect of changes in salinity of the Elephant Butte supply since 1930 for future adjustment. They therefore

266. *Id.* at 40.

267. Deposition of Raymond A. Hill at 18-19, Texas v. Colorado, 474 U.S. 1017 (1985) (deposition taken on Dec. 4, 1968) (on file with author).

268. *Id.* at 19.

269. *Id.* at 18.

recommended reviewing all provisions of the Compact in five years.[270]

On March 10, 1938, the Compact Commission met to receive the Second Report. On March 11, 1938, the Engineer Advisors submitted two pages of clarifications in response to the Compact Commission's questions.[271] With the clarifications in hand, the Commissioners appointed a legal committee to prepare a tentative draft of the Compact. Colorado appointed George Corlett, attorney for the Rio Grande Water Users Association, and Ralph Carr, attorney for the Conejos interests. New Mexico appointed Governor Hannett and Fred Wilson. Texas appointed Major Richard Burgess and Judge Edwin Mechem. The states concluded all of the subsequent negotiations and drafting of the Compact off the record.[272] Those negotiations continued from March 11 to March 17, 1938, when the drafting committee submitted the final draft of the Compact to the Compact Commission.[273] After a few final changes, the states approved and signed Compact on March 18, 1938.

During the course of these negotiations, the drafting committee asked the Engineer Advisors to comment on the various drafts of the Compact. In their comments on the March 16 draft, the Engineer Advisors recommended revising the schedule of deliveries for the Conejos River to correct a slight error in the curve used to determine the inflow-outflow relationship.[274] The recommended changes generally reduced the scheduled deliveries of the Conejos River by one or two thousand acre-feet for any given level of inflow.

VI. THE TERMS OF THE RIO GRANDE COMPACT

The Compact[275] signed in Santa Fe, New Mexico, on March 18, 1938, bears little resemblance to the 1929 Temporary Compact. Rather, it embodies the principles for the equitable allocation of water contained in the Second Report. The Compact consists of a preamble and seventeen articles. The preamble states that the purpose of the Compact is to effect an equitable apportionment of the Rio Grande above Fort Quitman, Texas, among Colorado, New Mexico, and Texas.[276] Article I contains the definition of seventeen terms crucial to understanding and interpreting the Compact.[277]

The important definitions in Article I include "Project Storage," defined as "the combined capacity of Elephant Butte Reservoir and all other reservoirs actually available for the storage of usable water below Elephant Butte and above the first diversion to lands of the Rio

270. *1938 Proceedings, supra* note 249, at 65.
271. *Id.* at 29-31.
272. *Id.* at 33.
273. *Id.*
274. *Id.* at 68.
275. Rio Grande Compact, COLO. REV. STAT. §§ 37-66-101 to 102 (2001), 53 Stat. 785 (copy attached as Appendix I to this article).
276. *Id.*
277. *Id.* art. 1, 53 Stat. at 785-86.

Grande Project, but not more than a total of 2,638,860 acre-feet."[278] This definition serves to limit the total quantity of Project Storage, and limits it to the area between Elephant Butte Reservoir and the first diversion to Project lands.

The Compact defines "Usable Water" as "all water, *exclusive of credit water*, which is in project storage and which is available for release *in accordance with irrigation demands*, including deliveries to Mexico."[279] (Emphasis supplied). The significance of this definition is that it excludes credit water from the water usable to serve the Project. In addition, it limits the timing of releases of Project water to those made in accordance with irrigation demand.

The Compact defines "Credit Water" as "that amount of water in project storage which is equal to the accrued credit of Colorado, or New Mexico, or both."[280]

"Actual Spill" is defined as:

> [A]ll water which is actually spilled from Elephant Butte reservoir, or is released therefrom for flood control, in excess of the current demand on project storage and which does not become usable water by storage in another reservoir; provided, that actual spill of usable water cannot occur until all *credit water* shall have been spilled.[281] (Emphasis supplied).

Thus, credit water spills before Project water.

"Hypothetical Spill" is defined as:

> [T]he time in any year at which usable water would have spilled from project storage if 790,000 acre-feet had been released therefrom at rates proportional to the actual release in every year from the starting date to the end of the year in which hypothetical spill occurs, in computing hypothetical spill the initial condition shall be the amount of usable water in project storage at the beginning of the calendar year following the effective date of this compact, and thereafter the initial condition shall be the amount of usable water in project storage at the beginning of the calendar year following each actual spill.[282]

This provision prevents Project water users from gaining any benefit from excessive releases that otherwise prevent a spill from occurring.

Article II identifies the twelve stream gauging stations necessary for administration of the Compact and requires installation and maintenance of gauging stations below any reservoir constructed after 1929, and at such other points as are necessary for carrying out the

278. *Id.* art. 1, 53 Stat. at 786.
279. *Id.*
280. Rio Grande Compact, COLO. REV. STAT. art. 1, § 37-66-101 (2001), 53 Stat. 785, 786.
281. *Id.*
282. *Id.*

Compact.[283]

Article III contains Colorado's delivery obligation at the Colorado-New Mexico state line.[284] The first schedule of deliveries is that of the Conejos River and the second schedule of deliveries is that of the Rio Grande.[285] The combination of these two schedules, less than 10,000 acre-feet, comprises Colorado's annual delivery schedule.[286] While not stated in the Compact, the separate delivery schedules impose separate obligations on the Rio Grande and the Conejos River to meet their separate delivery obligations.[287] Thus, Colorado's Compact obligation is allocated intrastate based upon the separate delivery schedules, not through the operation of a unified basin-wide administration under the priority system. One reason for this is that before the Compact, the Conejos River and the Rio Grande operated independently of one another, and the Compact did nothing to alter the historical method of intrastate administration.[288]

Article IV is New Mexico's schedule of deliveries to San Marcial.[289] Due to persistent concerns about this schedule and the desire to have a twelve, rather than a nine-month schedule, the Compact Commission, in 1948, adopted a new, year-round schedule of deliveries for New Mexico.[290] That schedule eliminated use of the San Marcial gauging station and replaced it with the Elephant Butte Effective Index Supply. This index supply is defined as the recorded flow below Elephant Butte Dam during the calendar year, plus the net gain in storage or minus the net loss in storage during the calendar year, as the case may be. This is essentially the same standard for measurement of deliveries recommended in the First Report, except that it is a twelve-month schedule and based upon a different inflow-outflow relationship (see Appendix II for a comparison of schedules).

Article V is an administrative provision that permits the Commission, by unanimous action, to abandon unreliable gauging stations and substitute new stations, provided the new stations supply substantially the same results.[291]

Article VI contains the provisions for credits and debits and limitations on new storage in Colorado and New Mexico.[292] In his report to Governor Ammons, M. C. Hinderlider gave the following

283. *Id.* art. 2, 53 Stat. at 786-87.

284. *Id.* art. 3, 53 Stat. at 787-88.

285. Rio Grande Compact, COLO. REV. STAT. art. 3, § 37-66-101 (2001), 53 Stat. 785, 787-88.

286. *Id.*

287. *See* Alamosa-La Jara Water Users Protection Ass'n v. Gould, 674 P.2d 914, 921 (Colo. 1984).

288. *Id.* at 923.

289. Rio Grande Compact, COLO. REV. STAT. art. 4, § 37-66-101 (2001), 53 Stat. 785, 788.

290. TENTH ANNUAL REPORT OF THE RIO GRANDE COMPACT COMMISSION 1948, at 17-19; *see generally* Hill, *supra* note 123, at 180-81.

291. Rio Grande Compact, COLO. REV. STAT. art. 5, § 37-66-101 (2001), 53 Stat. 785, 789.

292. *Id.* art. 6, 53 Stat. at 789-90.

summary of Article VI and Colorado's ability to vary from its scheduled deliveries:

> Such variation in any year by Colorado may amount to as much as 100,000 acre-feet, together with larger debits resulting from holdover storage, without violating Colorado's obligation to meet its schedule of deliveries at the stateline. This provision is necessary to permit future diversions in Colorado in any year by presently decreed appropriations in the San Luis Valley in substantially the same manner in which the diversions and uses have been made in past years. Colorado, however, must always retain in storage reservoirs sufficient water to repay any debits due from failure to meet the required schedule of stateline deliveries. It should be noted that this obligation applies only to reservoirs constructed after 1937, and in no way affects the rights of present reservoirs in Colorado to store water within the limits of their present decrees.
>
> This Article also provides that Colorado or New Mexico may not accumulate annual credits in Elephant Butte reservoir in excess of 150,000 acre-feet of water. This limitation is designed to prevent unsound expansion of development which otherwise might result from accumulations of large annual credits, and which also might reduce the available capacity of that reservoir to regulate the portion of the river flow to which the lands under the Elephant Butte project are rightfully entitled.
>
> Paragraph six of Article VI provides that the Commissioners of the upper states, which have accrued credits in Elephant Reservoir, may authorize any part of such credits to be used under the Elephant Butte project, if in their judgment failure to release such credits would result in "actual spill" from the Elephant Butte Reservoir. This would permit, at times, a greater use of water under that project for reduction of salinity in the lands, which, if not used, would pass over the spillway and be wasted down the river. It should be noted, however, that such releases of credit water belonging to an upper state is entirely optional with the Commissioner of the state holding such credits, and would not be agreed to unless, in his judgment, the stage of storage in Elephant Butte Reservoir at that time, or the prospect for an abnormally large runoff from the basin above, would definitely indicate that such credits would later be floated out over the spillway, or through the flood release valves of Elephant Butte Reservoir, of which no beneficial use could be made.
>
> This Article also provides for reduction in the amount of credit water held in Elephant Butte storage, and debit water held in reservoirs in upper New Mexico and Colorado constructed after 1929, to compensate for losses due to evaporation.[293]

Article VII of the Compact,[294] again as summarized by M. C. Hinderlider:

> [P]rohibits increase in storage of water in reservoirs in Colorado and New Mexico constructed after 1929, whenever there is less than 400,000 acre-feet of usable water in storage in Elephant Butte

293. M.C. Hinderlider, *Analysis of Compact, in* RIO GRANDE BASIN COMPACT 24-25 [hereinafter Hinderlider] (on file with the author).

294. Rio Grande Compact, COLO. REV. STAT. art. 7, § 37-66-101 (2001), 53 Stat. 785, 790.

> Reservoir, provided, however, that, if the total releases of usable water from that reservoir since the effective date of the Compact, or the last actual spill from the reservoir, have aggregated more than an average of 790,000 acre-feet per year, including required deliveries to Mexico, the time and amount of minimum storage in Elephant Butte Reservoir shall be adjusted for the excess deliveries.[295]

Article VIII implements Royce Tipton's recommendation to retain as much water in upstream storage as is consistent with a full water supply for the Project.[296] As summarized by Hinderlider:

> Article VIII provides for the releases of water from storage reservoirs in Colorado and New Mexico constructed after 1929, to the extent of accrued debits against those states at "the greatest rate practicable under the conditions then prevailing", sufficient to bring the quantity of usable water in Elephant Butte storage to 600,000 acre-feet, and to insure a release from that reservoir of 790,000 acre-feet in such year.
>
> This provision is to prevent shortage under the Elephant Butte Reservoir due to the withholding of water which would otherwise have been in storage in that reservoir. The terms of the provisions are such that the release of the water can be made at a rate to protect structures and property along the Conejos and Rio Grande against high stages of flow, and to insure that the releases of reservoir water may be made in such manner as not to encroach upon the stream channel capacity to the detriment of the use of such capacity by Colorado appropriators.[297]

Article IX addresses importation of water into the Rio Grande Basin from the San Juan River.[298] Article X assures that such importation will protect present and future uses in Colorado and provides that proper credit will be given for the importation of such water.[299]

Article XI, in the view of Hinderlider:

> [I]s a most important declaration of principle with respect to the responsibility of an upper state, or citizen thereof, for the quality or character of the water flowing from an upper state into another state, and is designed for the protection of the interests of the upper state and its water users. It will be noted that there is now no question concerning the quality or character of the waters of the Upper Rio Grande Basin, but any state may at a later time raise this question in an action before the Supreme Court of the United States, should it decide that a change in quality or character of the waters in later

295. Hinderlider, *supra* note 293, at 25.

296. Rio Grande Compact, COLO. REV. STAT. art. 8, § 37-66-101 (2001), 53 Stat. 785, 790.

297. Hinderlider, *supra* note 293, at 25.

298. Rio Grande Compact, COLO. REV. STAT. art. 9, § 37-66-101 (2001), 53 Stat. 785, 790.

299. *Id.* art. 10, 53 Stat. at 790.

years justifies such action.[300]

Article XII sets up the administrative machinery for the Compact.[301] The Rio Grande Compact is the first interstate water compact to create a permanent commission responsible for overseeing its provisions. Article XIII permits the Compact Commission to review, at the end of each five-year period after the effective date of the Compact, any nonsubstantive provisions that do not affect the basic principles upon which the Compact is founded.[302] Any changes the Compact Commission makes to the Compact must be unanimous and the legislatures of the several states must ratify such changes and Congress must consent to the changes.[303]

Article XIV addresses deliveries to Mexico.[304] Hinderlider understood this article as

> [D]esigned to protect Colorado and New Mexico against any increases in future uses of water by Mexico over and above the 60,000 acre-feet recognized by treaty. By the provisions of this Article, any decrease in uses of water by Mexico would be to the benefit of the water users under the Elephant Butte Reservoir.[305]

Article XV declares the Rio Grande Compact is based upon conditions peculiar to the Rio Grande Basin and does not establish any general principle or precedent applicable to other interstate streams.[306] Article XVI recognizes that nothing in the Compact affects the United States' obligations to Mexico under existing treaties or to Indian tribes. Nor does the Compact impair the rights of Indian tribes.[307]

Finally, Article XVII provides the Compact will become effective when ratified by each state and consented to by Congress.[308] Colorado ratified the Compact on February 21, 1939; Texas ratified it on March 1, 1939; New Mexico ratified it on March 2, 1939; and the United States consented to the Compact on May 31, 1939.[309]

VII. APPORTIONMENT OF THE RIO GRANDE PROJECT WATER SUPPLY

While the three states were conducting Compact negotiations, other water users were negotiating allocation of the Project repayment

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300. Hinderlider, supra note 293, at 26.

301. Rio Grande Compact, COLO. REV. STAT. art. 12, § 37-66-101 (2001), 53 Stat. 785, 791.

302. *Id.* art. 13, 53 Stat. at 791-92.

303. *Id.*

304. *Id.* art. 14, 53 Stat. at 792.

305. Hinderlider, supra note 293, at 26.

306. Rio Grande Compact, COLO. REV. STAT. art. 15, § 37-66-101 (2001), 53 Stat. 785, 792.

307. *Id.* art. 16, 53 Stat. at 792.

308. *Id.* art. 17, 53 Stat. at 792.

309. Littlefield, *supra* note 29, at 312.

obligations and water supply. Recall that in 1904, the fledgling Reclamation Service's plan for the Project predicted Elephant Butte Reservoir would provide sufficient water to irrigate 180,000 acres in the United States and Mexico. The Rio Grande Convention of 1906 allocated 60,000 acre-feet annually to Mexico, a quantity calculated to serve 25,000 acres. In the 1920s, the Elephant Butte Irrigation District ("EBID") and the El Paso Water Improvement District No. 1 ("El Paso District") were organized and then entered into contracts to repay the United States for Project costs. In 1929, shortly after the signing of the 1929 Temporary Compact, EBID and the El Paso District entered into a contract allocating the Project's irrigated acreage between them.[310]

The percentage allocation of acreage was also the percentage allocation of the repayment obligation to the United States. Under that contract, EBID was entitled to irrigate 88,000 acres and the El Paso District was entitled to irrigate 67,000 acres, for a total of 155,000 acres.[311] Including the 25,000 acres in Mexico, the total is 180,000 acres, the same number as the Reclamation Service had predicted in 1904,[312] and the basis upon which the 1904 International Irrigation Congress approved the Project.

Farmers under the Project struggled financially throughout the 1920s and 1930s due to the economy's collapse after World War I, the stock market crash, and the Great Depression. As a consequence, after 1929, they were forced to seek repayment relief and debt rescheduling to alleviate the burden of their repayment contracts.[313] The rescheduling and restructuring again forced EBID and the El Paso District to allocate the repayment obligation. The two districts believed a new inter-district agreement could provide the basis for apportioning repayment costs, water deliveries, and the Project income. Thus, in February of 1938, the two districts agreed to split the Project costs, income, and water supplies based on 88,000 irrigated acres or 56.77 percent to EBID and 67,000 irrigated acres or 43.23 percent to the El Paso District. The contract was in effect between the districts when Compact negotiations resumed in March 1938, and the Secretary of the Interior formally approved the contract on April 11, 1938.[314]

VIII. THE TEXAS RATIFICATION CONTROVERSY

After approving the Compact, the Commissioners for each state returned home to promote their state's ratification of the Compact. Controversies ensued over federal funding of projects in Colorado and New Mexico that impeded this progress.[315] Those controversies,

310. *See Contract Between Elephant Butte Irrigation District and El Paso County Water Improvement District No. 1, Feb. 16, 1938* (on file with author).

311. Littlefield, *supra* note 29, at 238.

312. *Id.*

313. *Id.* at 244-52.

314. *Id.* at 252.

315. *Id.* at 301-307.

however, proved relatively minor compared with the controversy confronting Texas Commissioner Frank Clayton. The water users on the Lower Rio Grande between Fort Quitman and the Gulf of Mexico believed that because Elephant Butte Reservoir served as the Compact's point of deliveries for Texas, rather than the New Mexico-Texas state line, that the Compact did not actually guarantee Texas any water.[316] Moreover, in January of 1938, the Lower Rio Grande water users had sent representatives to meet with Frank Clayton, Raymond Hill, and representatives of EBID and the El Paso District to discuss the First Report of the Engineer Advisors. At that meeting, the Lower Rio Grande water users requested that the Compact contain a clause guaranteeing water to their part of Texas. Clayton apparently dissuaded them from this demand on the basis that neither Colorado nor New Mexico could control the Compact's final allocation to Texas.[317] Charles Clark, Chairman of the Texas Board of Water Engineers, agreed with Clayton's conclusion and said that water users above and below Fort Quitman could accomplish an intrastate allocation agreement after ratification of the Compact.[318]

Shortly after the delegates signed the Compact, the Lower Rio Grande water users renewed their request for an intrastate allocation and vowed to fight Texas' ratification of the Compact unless an agreement could assure them 200,000 acre-feet annually at Fort Quitman. This, of course, was not possible under the Project because the United States owned the Project's water rights. The Bureau of Reclamation controlled releases from Elephant Butte Dam, and the El Paso District was unlikely to agree to aid in Project repayment if it had to deliver the water to downstream users. In the ensuing controversy, an attorney for the Lower Rio Grande water users wrote to Commissioner Clayton pointing out the obvious absence of a specific allocation of water below Elephant Butte to New Mexico and Texas. He then asked why the Compact did not expressly address the respective rights of New Mexico and Texas.[319]

Clayton replied that the Compact recognized the apportionment of the Rio Grande below Elephant Butte and that the 1938 inter-district agreement confirmed the division. Clayton went on to explain that:

> "[T]he question of the division of the water released from Elephant Butte reservoir is taken care of by contracts between the districts under the Rio Grande Project and the Bureau of Reclamation. These contracts provide that 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 1938 interdistrict agreement], the total area is 'frozen' at the figure representing the acreage now actually in cultivation: approximately

316. Littlefield, *supra* note 29, at 302.
317. *Id.* at 303.
318. *Id.* at 303-304.
319. *Id.* at 309-10.

> 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 for each figure.[320]

This clarification apparently satisfied the Lower Rio Grande water users and Texas ratified the Compact on March 1, 1939.[321]

IX. COMPACT PERFORMANCE - 1950 TO 1985

During the 1940s, the Compact operated close to the vision of the Engineer Advisors. An "actual spill" of "usable water" occurred in 1942.[322] Colorado and New Mexico accrued credits and debits, but stayed within the limits of the Compact. In 1949, Colorado had an accrued credit of 144,700 acre-feet and New Mexico had a debt of 280,400 acre-feet and had 137,220 acre-feet of water retained in El Vado Reservoir.[323] And, at the end of 1949, Project Storage was 815,700 acre-feet, including 130,000 acre-feet of credit water.[324]

By the end of 1951, New Mexico's accrued debit had ballooned to 331,800 acre-feet and El Vado Reservoir was empty.[325] At the same time, Colorado had consumed its accrued credit and Project Storage had declined to 26,800 acre-feet.[326] At this point, Texas sued New Mexico for violation of the Compact.[327] In 1952, Colorado delivered 153,300 acre-feet less than its scheduled delivery,[328] this pattern of under-deliveries continued throughout the 1950s and 1960s. Likewise, New Mexico's debits continued to grow, reaching nearly 498,000 acre-feet in 1959.[329]

The 1950s brought little rain or snow. Rain and snowfall in both 1950 and 1951 was well below normal, although above average the following year.[330] The next four years, 1953 through 1956, are the driest four consecutive years of record on the Rio Grande.[331] Holdover

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320. *Id.* at 310-11.

321. Littlefield, *supra* note 29, at 312.

322. *See* FOURTH ANNUAL REPORT OF THE RIO GRANDE COMPACT COMMISSION 1942 (on file with author).

323. ELEVENTH ANNUAL REPORT OF THE RIO GRANDE COMPACT COMMISSION 1949, at 26, 27 (on file with author).

324. *Id.* at 28.

325. THIRTEENTH ANNUAL REPORT OF THE RIO GRANDE COMPACT COMMISSION 1951, at 28 (on file with author).

326. *Id.* at 27.

327. Texas v. New Mexico, No. 9, Original (on file with author). The complaint was dismissed for lack of necessary parties.

328. REPORT OF THE RIO GRANDE COMPACT COMMISSION 1952-1958, at 27 (on file with author).

329. REPORT OF THE RIO GRANDE COMPACT COMMISSION 1959, at 28 (on file with author).

330. REPORT OF THE RIO GRANDE COMPACT COMMISSION 1950, at 30; REPORT OF THE RIO GRANDE COMPACT COMMISSION 1951, at 30; REPORT OF THE RIO GRANDE COMPACT COMMISSION 1952-1958, at 61 (all on file with author).

331. REPORT OF THE RIO GRANDE COMPACT COMMISSION 1952-1958, at 61. The U.S. Geological Survey maintains annual stream flow records of the Rio Grande at the gauging station near Del Norte. A compilation of these records are on file with the

storage in post-1929 reservoirs was not the cause of Colorado and New Mexico's departures from scheduled deliveries. Colorado had only one post-Compact reservoir of any consequence—the 60,000 acre-foot Platoro Reservoir on the Conejos River, completed in 1951.[332] During the same time, New Mexico did not carry over water in post-1929 reservoirs.[333] Thus, the large under-deliveries in this period give credence to Tipton's view that Colorado's natural departures would exceed 100,000 acre-feet during a series of dry years.

New Mexico was able to obtain federal funds for channel improvements, levies, low-flow conveyance channels, and other works to help control and reduce its accrued debits. This, in addition to new structures built pursuant to the Congressional authorization of the Middle Rio Grande Project in 1948,[334] and the authorizations of additional works in 1960,[335] aided New Mexico in reducing its accrued debit by nearly 200,000 acre-feet in 1968.[336]

Colorado's debit, on the other hand, continued to increase. By 1966, Colorado's accrued debit was 927,300 acre-feet.[337] At that point, Texas and New Mexico sued Colorado for violation of the Compact.[338] In 1967, Colorado's debit reached its maximum of 944,400 acre-feet.[339] In 1968, Colorado, New Mexico, and Texas stipulated to a stay of the pending litigation conditioned upon Colorado meeting its delivery obligations on an annual basis, without the allowance for annual debits or credits. The stipulation also required Colorado to employ all available legal powers, including curtailment of diversions, to assure annual compliance.[340]

Colorado thereafter implemented strict administration of surface water rights,[341] and imposed a moratorium on new well construction.[342] As a consequence, Colorado began to slowly reduce its accrued debit. By 1975, Colorado reduced the accrued debit to 725,200 acre-feet,[343]

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author.

332. REPORT OF THE RIO GRANDE COMPACT COMMISSION 1952-1958, at 72 (on file with author).

333. *Id.* at 73-75.

334. Act of June 30, 1948, ch. 771, § 203, Pub. L. No. 80-858, 62 Stat. 1171.

335. Act of July 14, 1960, §§ 201-203, Pub. L. No. 86-645, 74 Stat. 480, 492.

336. S. E. Reynolds & Philip B. Mutz, *Water Deliveries Under the Rio Grande Compact*, 14 NAT. RESOURCES J. 201, 203 (1974).

337. REPORT OF THE RIO GRANDE COMPACT COMMISSION 1962, at 27 (on file with author).

338. Texas v. Colorado, 389 U.S. 1000 (1967).

339. REPORT OF THE RIO GRANDE COMPACT COMMISSION 1967, at 27 (on file with author).

340. *See* Alamosa-La Jara Water Users Protection Ass'n v. Gould, 674 P.2d 914, 919 (Colo. 1984).

341. *Id.*

342. Personal Communications with Harold D. Simpson, Colorado State Engineer, and Steven E. Vandiver, Division Engineer, Water Division No. 3, Colorado (Rio Grande Basin) in Denver, Colo. (November, 1992).

343. REPORT OF THE RIO GRANDE COMPACT COMMISSION 1975, at 27 (on file with author).

and in 1980, the accrued debit stood at 674,600 acre-feet.[344] In 1984, the unfilled capacity of Elephant Butte Reservoir was less than the combined debits of Colorado and New Mexico. Thus, in accordance with Article VI of the Compact, Colorado's accrued debit was reduced to 512,100 acre-feet.[345] In 1985, an actual spill of usable water from Elephant Butte Reservoir occurred for the first time since 1942.[346] The spill eliminated Colorado's accrued debit, and on December 9, 1985, the U.S. Supreme Court granted Texas and New Mexico's motion to dismiss their lawsuit against Colorado with prejudice.[347] Since 1985, Colorado has continually complied with its delivery obligations under the Compact.

X. CONCLUSION

The Rio Grande Compact is unique among interstate water compacts to which the state of Colorado is a party. It is the only compact that includes an annual schedule of deliveries, a more or less objective standard by which to measure compact compliance. It is also unique in that it apportions water by geographic regions rather than purely political boundaries. In Colorado's case, its apportionment is to the San Luis Valley, which corresponds to the state's political boundary. In the case of New Mexico, it has two separate apportionments, one to the area above Elephant Butte Reservoir, and one to Project lands. The apportionment to Texas is part of the water supply delivery to Project lands. Furthermore, a contract allocated Project water between lands in New Mexico and Texas, distributing the Project water supply between the Elephant Butte Irrigation District in New Mexico and the El Paso District in Texas.

The Compact and the engineering principles upon which it is based relied largely on the Rio Grande Joint Investigation. At that time, there were only about forty-eight years of stream flow records on the Rio Grande. This limited period does not encompass the variety of hydrologic conditions on the Rio Grande. Thus, states have not found the Compact as easy or as painless to comply with as the negotiators had envisioned.

The Compact apparently did not achieve its stated goal of allowing existing levels of use to continue in Colorado without curtailment. The Rio Grande, as well as the Conejos River, requires large curtailments in most years. While the reasons for the Compact's apparent failure in this regard are not immediately evident, pre-Compact water rights regularly feel the effect of these surface water curtailments.

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344. REPORT OF THE RIO GRANDE COMPACT COMMISSION 1980, at 27 (on file with author).

345. REPORT OF THE RIO GRANDE COMPACT COMMISSION 1984, at 27 (on file with author).

346. REPORT OF THE RIO GRANDE COMPACT COMMISSION 1985, at 27-29 (on file with author).

347. Texas v. Colorado, 474 U.S. 1017 (1985).

In addition, Colorado has not received the intended benefit of storage to make its surface water supply parallel crop water needs. With the exception of Platoro Reservoir, Colorado was unable to construct any large post-Compact reservoirs. Efforts to provide drainage from the Closed Basin have also met with limited success. In 1988, the federal Closed Basin Project began operations to deliver 60,000 acre-feet annually to assist Colorado in meeting its Compact obligations.[348] The Closed Basin Project has not achieved that goal.

Furthermore, although Colorado has not realized many of the benefits sought by the Compact, it is still better off than before the Compact. The Compact clearly defines Colorado's share of the water of the Rio Grande, and the shares apportioned to northern New Mexico and to Project lands in New Mexico and Texas. The Compact assures Colorado that Project Storage, not a change in Colorado's delivery obligation, will be the source of any change in deliveries to Mexico. Likewise, so long as Colorado meets its delivery obligations, it is not required to deliver any particular amount of water at any particular time or rate of flow to the downstream states. Thus, even though the Compact has not performed as Colorado's Compact negotiators had envisioned, it does provide certainty to water users in Colorado.

348. Act of Oct. 3, 1980, Pub. L. No. 92-514, 86 Stat. 964, as amended; Act of Oct. 3, 1980, Pub. L. No. 96-375, § 6, 94 Stat. 1505, 1507; Act of Oct. 30, 1984, Pub. L. No. 98-570, 98 Stat. 2941-42; Act of Oct. 24, 1988, Pub. L. No. 100-516, § 22, 102 Stat. 2575-76. *See also* Closed Basin Landowners Ass'n. v. Rio Grande Water Conservation Dist., 734 P.2d 627 (Colo. 1987) (describing the Closed Basin Project).

XI. APPENDIX I

RIO GRANDE COMPACT

The State of Colorado, the State of New Mexico, and the State of Texas, desiring to remove all causes of present and future controversy among these States and between citizens of one of these States and citizens of another State with respect to the use of the waters of the Rio Grande above Fort Quitman, Texas, and being moved by considerations of interstate comity, and for the purpose of effecting an equitable apportionment of such waters, have resolved to conclude a Compact for the attainment of these purposes, and to that end, through their respective Governors, have named as their respective Commissioners:

For the State of Colorado	M. C. Hinderlider
For the State of New Mexico	Thomas M. McClure
For the State of Texas	Frank B. Clayton

Who, after negotiations participated in by S. O. Harper, appointed by the President as the representative of the United States of America, have agreed upon the following articles, to-wit:

ARTICLE I

(a) The State of Colorado, the State of New Mexico, the State of Texas, and the United States of America, are hereinafter designated "Colorado," "New Mexico," "Texas," and the "United States," respectively.

(b) "The Commission" means the agency created by this Compact for the administration thereof.

(c) The term "Rio Grande Basin" means all of the territory drained by the Rio Grande and its tributaries in Colorado, in New Mexico, and in Texas above Fort Quitman, including the Closed Basin in Colorado.

(d) The "Closed Basin" means that part of the Rio Grande Basin in Colorado where the streams drain into the San Luis Lakes and adjacent territory, and do not normally contribute to the flow of the Rio Grande.

(e) The term "tributary" means any stream which naturally contributes to the flow of the Rio Grande.

(f) "Transmountain Diversion" is water imported into the drainage basin of the Rio Grande from any stream system outside of the Rio Grande Basin, exclusive of the Closed Basin.

(g) "Annual Debits" are the amounts by which actual deliveries in any calendar year fall below scheduled deliveries.

(h) "Annual Credits" are the amounts by which actual deliveries in any calendar year exceed scheduled deliveries.

(i) "Accrued Debits" are the amounts by which the sum of all annual debits exceeds the sum of all annual credits over any common

period of time.

(j) "Accrued Credits" are the amounts by which the sum of all annual credits exceeds the sum of all annual debits over any common period of time.

(k) "Project Storage" is the combined capacity of Elephant Butte Reservoir and all other reservoirs actually available for the storage of usable water below Elephant Butte and above the first diversion to lands of the Rio Grande Project, but not more than a total of 2,638,860 acre feet.

(l) "Usable Water" is all water, exclusive of credit water, which is in project storage and which is available for release in accordance with irrigation demands, including deliveries to Mexico.

(m) "Credit Water" is that amount of water in project storage which is equal to the accrued credit of Colorado, or New Mexico, or both.

(n) "Unfilled Capacity" is the difference between the total physical capacity of project storage and the amount of usable water then in storage.

(o) "Actual Release" is the amount of usable water released in any calendar year from the lowest reservoir comprising project storage.

(p) "Actual Spill" is all water which is actually spilled from Elephant Butte Reservoir, or is released therefrom for flood control, in excess of the current demand on project storage and which does not become usable water by storage in another reservoir; provided, that actual spill of usable water cannot occur until all credit water shall have been spilled.

(q) "Hypothetical Spill" is the time in any year at which usable water would have spilled from project storage if 790,000 acre feet had been released therefrom at rates proportional to the actual release in every year from the starting date to the end of the year in which hypothetical spill occurs; in computing hypothetical spill the initial condition shall be the amount of usable water in project storage at the beginning of the calendar year following the effective date of this Compact, and thereafter the initial condition shall be the amount of usable water in project storage at the beginning of the calendar year following each actual spill.

ARTICLE II

The Commission shall cause to be maintained and operated a stream gauging station equipped with an automatic water stage recorder at each of the following points, to-wit:

(a) On the Rio Grande near Del Norte above the principal points of diversion to the San Luis Valley;

(b) On the Conejos River near Mogote;

(c) On the Los Pinos River near Ortiz;

(d) On the San Antonio River at Ortiz;

(e) On the Conejos River at its mouths near Los Sauces;

(f) On the Rio Grande near Lobatos;
(g) On the Rio Chama below El Vado Reservoir;
(h) On the Rio Grande at Otowi Bridge near San Ildefonso;
(i) On the Rio Grande near San Acacia;
(j) On the Rio Grande at San Marcial;
(k) On the Rio Grande below Elephant Butte Reservoir;
(l) On the Rio Grande below Caballo Reservoir.

Similar gauging stations shall be maintained and operated below any other reservoir constructed after 1929, and at such other points as may be necessary for the securing of records required for the carrying out of the Compact; and automatic water stage recorders shall be maintained and operated on each of the reservoirs mentioned, and on all others constructed after 1929.

Such gauging stations shall be equipped, maintained and operated by the Commission directly or in cooperation with an appropriate Federal or State agency, and the equipment, method and frequency of measurement at such stations shall be such as to produce reliable records at all times.

ARTICLE III

The obligation of Colorado to deliver water in the Rio Grande at the Colorado-New Mexico State Line, measured at or near Lobatos, in each calendar year, shall be ten thousand acre feet less than the sum of those quantities set forth in the two following tabulations of relationship, which correspond to the quantities at the upper index stations:

DISCHARGE OF CONEJOS RIVER
Quantities in thousand of acre-feet

Conejos Index Supply (1)	Conejos River at Mouths (2)
100	0
150	20
200	45
250	75
300	109
350	147
400	188
450	232
500	278
550	326
600	376
650	426
700	476

Intermediate quantities shall be computed by proportional parts.

(1) Conejos Index Supply is the natural flow of Conejos River at

the U.S.G.S. gauging station near Mogote during the calendar year, plus the natural flow of Los Piños River at the U.S.G.S. gauging station near Ortiz and the natural flow of San Antonio River at the U.S.G.S. gauging station at Ortiz, both during the months of April to October, inclusive.

(2) Conejos River at Mouths is the combined discharge of branches of this river at the U.S.G.S. gauging stations near Los Sauces during the calendar year.

DISCHARGE OF RIO GRANDE EXCLUSIVE OF CONEJOS RIVER

Quantities in thousands of acre-feet

Rio Grande at Lobatos less Rio Grande at Del Norte (3)	Conejos at Mouths (4)
200	60
250	65
300	75
350	86
400	98
450	112
500	127
550	144
600	162
650	182
700	204
750	229
800	257
850	292
900	335
950	380
1,000	430
1,100	540
1,200	640
1,300	740
1,400	840

Intermediate quantities shall be computed by proportional parts.

(3) Rio Grande at Del Norte is the recorded flow of the Rio Grande at the U.S.G.S. gauging station near Del Norte during the calendar year (measured above all principal points of diversion to San Luis Valley) corrected for the operation of reservoirs constructed after 1937.

(4) Rio Grande at Lobatos less Conejos at Mouths is the total flow of the Rio Grande at the U.S.G.S. gauging station near Lobatos, less the discharge of Conejos River at its Mouths, during the calendar year.

The application of these schedules shall be subject to the provisions hereinafter set forth and appropriate adjustments shall be made for (a) any change in location of gauging stations; (b) any new or increased depletion of the runoff above inflow index gauging stations; and (c) any transmountain diversions into the drainage basin of the Rio Grande above Lobatos.

In event any works are constructed after 1937 for the purpose of delivery water into the Rio Grande from the Closed Basin, Colorado shall not be credited with the amount of such water delivered, unless the proportion of sodium ions shall be less than forty-five percent of the total positive ions in that water when the total dissolved solids in such water exceeds three hundred fifty parts per million.

ARTICLE IV[349]

The obligation of New Mexico to deliver water in the Rio Grande into Elephant Butte Reservoir during each calendar year shall be measured by that quantity set forth in the following tabulation of relationship which corresponds to the quantity at the upper index station:

DISCHARGE OF RIO GRANDE AT OTOWI BRIDGE
AND ELEPHANT BUTTE EFFECTIVE SUPPLY
Quantities in thousands of acre-feet

Otowi Index Supply (5)	Elephant Butte Effective Supply Index Supply (6)
100	57
200	114
300	171
400	228
500	286
600	345
700	406
800	471
900	542
1,000	621
1,100	707
1,200	800
1,300	897
1,400	996
1,500	1,095
1,600	1,195
1,700	1,295

349. Amended Article IV reflecting the Resolution of the Rio Grande Compact Commission adopted February, 1948 replacing the original schedule of deliveries at San Marcial with the Elephant Butte Effective Supply.

1,800	1,395
1,900	1,495
2,000	1,595
2,100	1,695
2,200	1,795
2,300	1,895
2,400	1,995
2,500	2,095
2,600	2,195
2,700	2,295
2,800	2,395
2,900	2,495
3,000	2,595

Intermediate quantities shall be computed by proportional parts.

(5) The Otowi Index Supply is the recorded flow of the Rio Grande at the U.S.G.S. gauging station at Otowi Bridge near San Ildefonso (formerly station near Buckman) during the calendar year, corrected for the operation of reservoirs constructed after 1929 in the drainage basin of the Rio Grande between Lobatos and Otowi Bridge.

(6) Elephant Butte Effective Index Supply is the recorded flow of the Rio Grande at the gauging station below Elephant Butte Dam during the calendar year plus the net gain in storage in Elephant Butte Reservoir during the same year or minus the net loss in storage in said reservoir, as the case may be.

The application of this schedule shall be subject to the provisions hereinafter set forth and appropriate adjustments shall be made for (a) any change in location of gauging stations; (b) depletion after 1929 in New Mexico of the natural runoff at Otowi Bridge, and (c) any transmountain diversions into the Rio Grande between Lobatos and Elephant Butte Reservoir.

Concurrent records shall be kept of the flow of the Rio Grande at San Marcial, near San Acacia, and of the release from Elephant Butte Reservoir to the end that the records at these three stations may be correlated.[350]

ARTICLE V

If at any time it should be the unanimous finding and determination of the Commission that because of changed physical conditions, or for any other reason, reliable records are not obtainable, or cannot be obtained, at any of the stream gauging stations herein referred to, such stations may, with the unanimous approval of the Commission, be abandoned, and with such approval another station, or other stations, shall be established and new measurements shall be substituted which, in the unanimous opinion of

350. This paragraph of Article IV was not changed by the Resolution of February, 1948.

the Commission, will result in substantially the same results so far as the rights and obligations to deliver water are concerned, as would have existed if such substitution of stations and measurements had not been so made.

ARTICLE VI

Commencing with the year following the effective date of this Compact, all credits and debits of Colorado and New Mexico shall be computed for each calendar year, provided, that in a year of actual spill no annual credits nor annual debits shall be computed for that year.

In the case of Colorado, no annual debit nor accrued debit shall exceed 100,000 acre feet, except as either or both may be caused by holdover storage of water in reservoirs constructed after 1937 in the drainage basin of the Rio Grande above Lobatos. Within the physical limitations of storage capacity in such reservoirs, Colorado shall retain water in storage at all times to the extent of its accrued debit.

In the case of New Mexico, the accrued debit shall not exceed 200,000 acre feet at any time, except as such debit may be caused by holdover storage of water in reservoirs constructed after 1929 in the drainage basin of the Rio Grande between Lobatos and San Marcial. Within the physical limitations of storage capacity in such reservoirs, New Mexico shall retain water in storage at all times to the extent of its accrued debit. In computing the magnitude of accrued credits or debits, New Mexico shall not be charged with any greater debit in any one year than the sum of 150,000 acre-feet and all gains in the quantity of water in storage in such year.

The Commission by unanimous action may authorize the release from storage of any amount of water which is then being held in storage by reason of accrued debits of Colorado or New Mexico; provided, that such water shall be replaced at the first opportunity thereafter.

In computing the amount of accrued credits and accrued debits of Colorado or New Mexico, any annual credits in excess of 150,000 acre feet shall be taken as equal to that amount.

In any year in which actual spill occurs, the accrued credits of Colorado, or New Mexico, or both, at the beginning of the year shall be reduced in proportion to their respective credits by the amount of such actual spill; provided that the amount of actual spill shall be deemed to be increased by the aggregate gain in the amount of water in storage, prior to the time of spill, in reservoirs above San Marcial constructed after 1929; provided, further, that if the Commissioners for the States having accrued credits authorize the release of part, or all, of such credits in advance of spill, the amount so released shall be deemed to constitute actual spill.

In any year in which there is actual spill of usable water, or at the time of hypothetical spill thereof, all accrued debits of Colorado, or New Mexico, or both, at the beginning of the year shall be cancelled.

In any year in which the aggregate of accrued debits of Colorado and New Mexico exceeds the minimum unfilled capacity of project storage, such debits shall be reduced proportionally to an aggregate amount equal to such minimum unfilled capacity.

To the extent that accrued credits are impounded in reservoirs between San Marcial and Courchesne, and to the extent that accrued debits are impounded in reservoirs above San Marcial, such credits and debits shall be reduced annually to compensate for evaporation losses in the proportion that such credits or debits bore to the total amount of water in such reservoirs during the year.

ARTICLE VII

Neither Colorado nor New Mexico shall increase the amount of water in storage in reservoirs constructed after 1929 whenever there is less than 400,000 acre feet of usable water in project storage; provided, that if the actual releases of usable water from the beginning of the calendar year following the effective date of this Compact, or from the beginning of the calendar year following actual spill, have aggregated more than an average of 790,000 acre feet per annum, the time at which such minimum stage is reached shall be adjusted to compensate for the difference between the total actual release and releases at such average rate; provided, further, that Colorado, or New Mexico, or both, may relinquish accrued credits at any time, and Texas may accept such relinquished water, and in such event the state, or states, so relinquishing shall be entitled to store water in the amount of the water so relinquished.

ARTICLE VIII

During the month of January of any year the Commissioner for Texas may demand of Colorado and New Mexico, and the Commissioner for New Mexico may demand of Colorado, the release of water from storage reservoirs constructed after 1929 to the amount of the accrued debits of Colorado and New Mexico, respectively, and such releases shall be made by each at the greatest rate practicable under the conditions then prevailing, and in proportion to the total debit of each, and in amounts, limited by their accrued debits, sufficient to bring the quantity of usable water in project storage to 600,000 acre feet by March first and to maintain this quantity in storage until April thirtieth, to the end that a normal release of 790,000 acre feet may be made from project storage in that year.

ARTICLE IX

Colorado agrees with New Mexico that in event the United States or the State of New Mexico decides to construct the necessary works for diverting the waters of the San Juan River, or any of its tributaries, into the Rio Grande, Colorado hereby consents to the construction of said works and the diversion of waters from the San Juan River, or the

tributaries thereof, into the Rio Grande in New Mexico, provided the present and prospective uses of water in Colorado by other diversions from the San Juan River, or its tributaries, are protected.

ARTICLE X

In the event water from another drainage basin shall be imported into the Rio Grande Basin by the United States or Colorado or New Mexico, or any of them jointly, the State having the right to the use of such water shall be given proper credit therefor in the application of the schedules.

ARTICLE XI

New Mexico and Texas agree that upon the effective date of this Compact all controversies between said States relative to the quantity or quality of the water of the Rio Grande are composed and settled; however, nothing herein shall be interpreted to prevent recourse by a signatory state to the Supreme Court of the United States for redress should the character or quality of the water, at the point of delivery, be changed hereafter by one signatory state to the injury of another. Nothing herein shall be constructed as an admission by any signatory state that the use of water for irrigation causes increase of salinity for which the user is responsible in law.

ARTICLE XII

To administer the provisions of this Compact there shall be constituted a Commission composed of one representative from each state, to be known as the Rio Grande Compact Commission. The State Engineer of Colorado shall be ex-officio the Rio Grande Compact Commissioner for Colorado. The State Engineer of New Mexico shall be ex-officio the Rio Grande Compact Commissioner for New Mexico. The Rio Grande Compact Commissioner for Texas shall be appointed by the Governor of Texas. The President of the United States shall be requested to designate a representative of the United States to sit with such Commission, and such representative of the United States, if so designated by the President, shall act as Chairman of the Commission without vote.

The salaries and personal expenses of the Rio Grande Compact Commissioners for the three States shall be paid by their respective States, and all other expenses incident to the administration of this Compact, not borne by the United States, shall be borne equally by the three States.

In addition to the powers and duties hereinbefore specifically conferred upon such Commission, and the members thereof, the jurisdiction of such Commission shall extend only to the collection, correlation and presentation of factual data and the maintenance of records having a bearing upon the administration of this Compact, and, by unanimous action, to the making of recommendations to the

respective States upon matters connected with the administration of this Compact. In connection therewith, the Commission may employ such engineering and clerical aid as may be reasonably necessary within the limit of funds provided for that purpose by the respective States. Annual reports compiled for each calendar year shall be made by the Commission and transmitted to the Governors of the signatory States on or before March first following the year covered by the report. The Commission may, by unanimous action, adopt rules and regulations consistent with the provisions of this Compact to govern their proceedings.

The findings of the Commission shall not be conclusive in any court or tribunal which may be called upon to interpret or enforce this Compact.

ARTICLE XIII

At the expiration of every five-year period after the effective date of this Compact, the Commission may, by unanimous consent, review any provisions hereof which are not substantive in character and which do not affect the basic principles upon which the Compact is founded, and shall meet for the consideration of such questions on the request of any member of the Commission; provided, however, that the provisions hereof shall remain in full force and effect until changed and amended within the intent of the Compact by unanimous action of the Commissioners, and until any changes in this Compact are ratified by the legislatures of the respective states and consented to by the Congress, in the same manner as this Compact is required to be ratified to become effective.

ARTICLE XIV

The schedules herein contained and the quantities of water herein allocated shall never be increased nor diminished by reason of any increase or diminution in the delivery or loss of water to Mexico.

ARTICLE XV

The physical and other conditions characteristic of the Rio Grande and peculiar to the territory drained and served thereby, and to the development thereof, have actuated this Compact and none of the signatory states admits that any provisions herein contained establishes any general principle or precedent applicable to other interstate streams.

ARTICLE XVI

Nothing in this Compact shall be construed as affecting the obligations of the United States of America to Mexico under existing treaties, or to the Indian Tribes, or as impairing the rights of the Indian Tribes.

ARTICLE XVII

This Compact shall become effective when ratified by the legislatures of each of the signatory states and consented to by the Congress of the United States. Notice of ratification shall be given by the Governor of each state to the Governors of the other states and to the President of the United States, and the President of the United States is requested to give notice to the Governors of each of the signatory states of the consent of the Congress of the Untied States.

IN WITNESS WHEREOF, the Commissioners have signed this Compact in quadruplicate original, one of which shall be deposited in the archives of the Department of State of the Untied States of America and shall be deemed the authoritative original, and of which a duly certified copy shall be forwarded to the Governor of each of the signatory States.

Done at the City of Santa Fe, in the State of New Mexico, on the 18th day of March, in the year of our Lord, One Thousand Nine Hundred and Thirty-eight.

(sgd.)M.C. Hinderlider
(sgd.)Thomas M. McClure
(sgd.)Frank B. Clayton

Approved:
(Sgd.) S.O. Harper

Ratified by:
Colorado, February 21, 1939
New Mexico, March 1, 1939
Texas, March 1, 1939

Passed Congress as Public Act No. 96, 76th Congress,
Approved by the President May 31, 1939

XII. APPENDIX II

Comparison of New Mexico Schedules of Deliveries					
First Proposal of Engineer Advisors		Original Compact Schedule (July. - Sept. excepted)		1948 Replacement Schedule	
Otowi Index Supply	Elephant Butte Index Supply	Otowi Index Supply	San Marcial Index Supply	Otowi Index Supply	Elephant Butte Effective Supply
100	12	100	0	100	57
200	57	200	65	200	114
300	113	300	141	300	171
400	173	400	219	400	228
500	237	500	300	500	286
600	305	600	383	600	345
700	378	700	469	700	406
800	455	800	557	800	471
900	540	900	648	900	542
1000	630	1000	742	1000	621
1100	725	1100	839	1100	707
1200	825	1200	939	1200	800
1300	935	1300	1042	1300	897
1400	1052	1400	1148	1400	996
1500	1175	1500	1257	1500	1095
1600	1305	1600	1370	1600	1195
1700	1440	1700	1489	1700	1295
1800	1583	1800	1608	1800	1395
1900	1737	1900	1730	1900	1495
2000	1895	2000	1856	2000	1595
2100	2058	2100	1985	2100	1695
2200	2224	2200	2117	2200	1795
2300	2392	2300	2253	2300	1895
				2400	1995
				2500	2095
				2600	2195
				2700	2295
				2800	2395
				2900	2495