

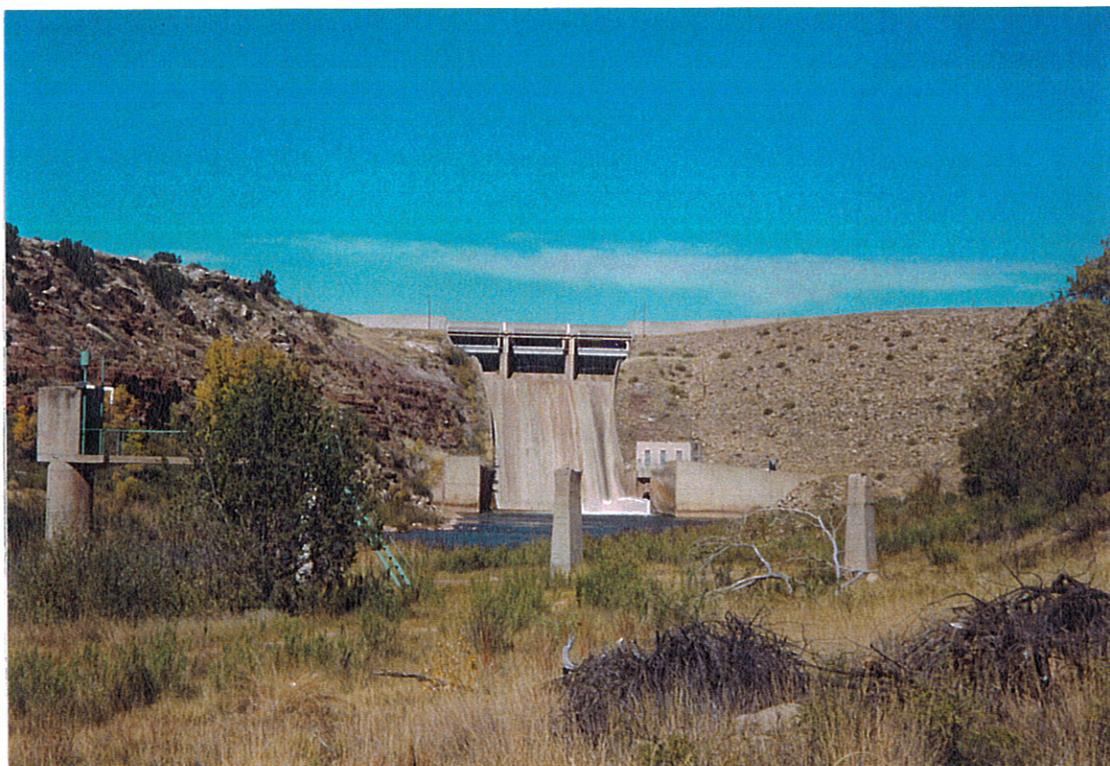
1998 Calendar Year Report to the

Pecos River Commission

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**UNITED STATES DEPARTMENT of the INTERIOR
BUREAU of RECLAMATION**



**Upper Colorado Region
Albuquerque Area Office
March 31, 1999**

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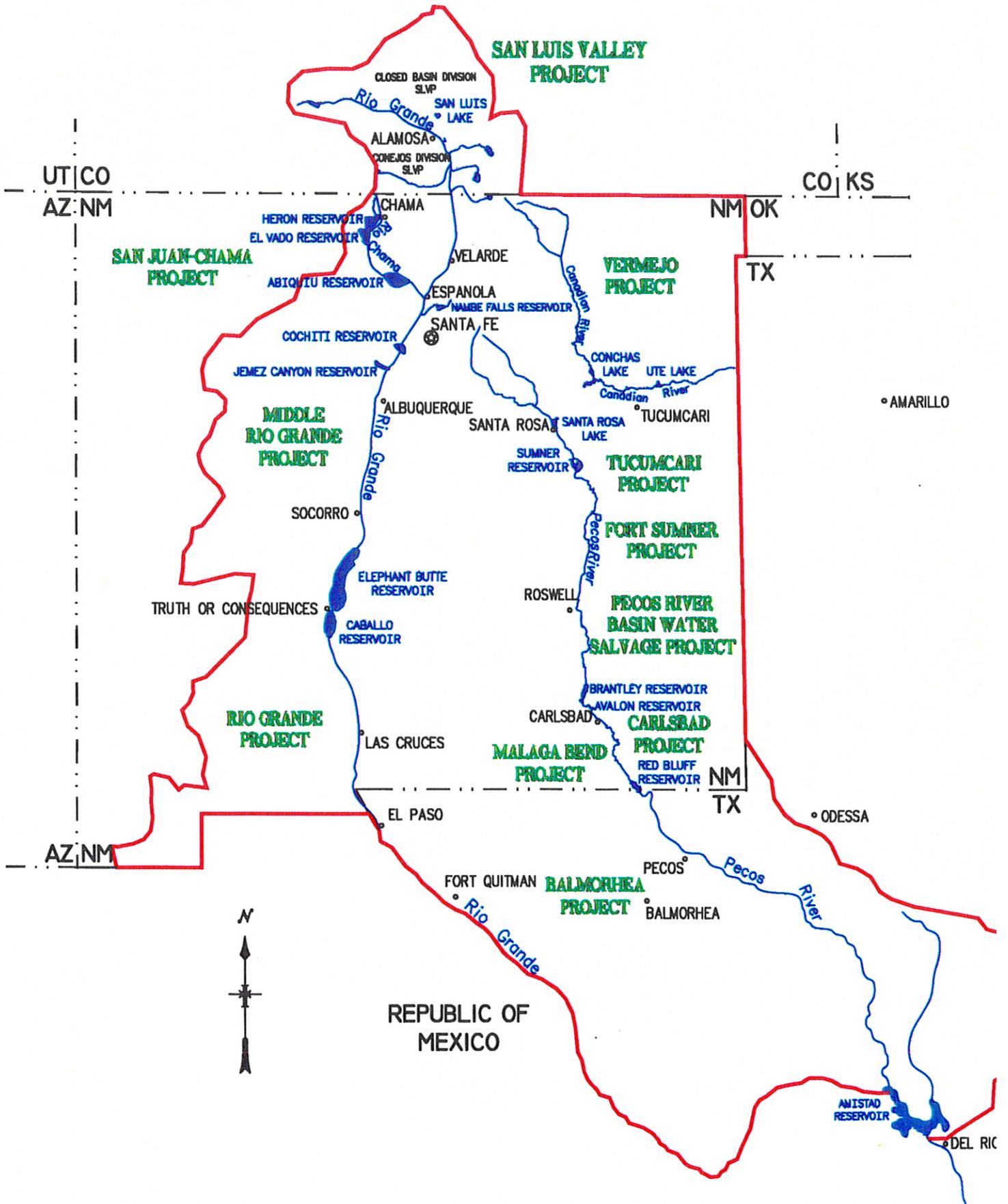


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**U. S. Bureau of Reclamation
Upper Colorado Region - Albuquerque Area Office
1998 Calendar Year Report to the Pecos River Commission**

INTRODUCTION

The Albuquerque Area Office of the Bureau of Reclamation (Reclamation) is responsible for operation, maintenance, and/or oversight of four projects on the Pecos River. These projects are: the *Carlsbad Project*, which includes Sumner, Brantley, and Avalon Dams; the *Pecos River Basin Water Salvage Project*; the *Fort Sumner Project*; and the *Malaga Bend Salinity Alleviation Project*.

Reclamation's Carlsbad Field Office continues to report to the Albuquerque Area Office's Water Resource Management Division. An agreement between Reclamation and Carlsbad Irrigation District (CID), finalized on October 2, 1989, provided for CID to operate and maintain Brantley and Sumner Dams, and the Pecos River Water Salvage Project. This contract was implemented during 1990 and has continued during 1998. Reclamation continues to be responsible for assuring that this work is accomplished in compliance with all applicable agreements, contracts, regulations, compacts, and other related laws.

CARLSBAD PROJECT

Crop Production

A total of 96,320 acre-feet (ac-ft) was diverted during 1998 from the Pecos River by the Carlsbad Irrigation District (CID), as measured at the Carlsbad Main Canal Heading¹.

As reported by CID, the major crops grown were alfalfa hay, cotton, and sorghum. Out of a total irrigable area of 21,018 acres, 20,131 acres were irrigated in 1998. Total gross crop value was \$10,958,480, with an average crop value of \$544.35 per irrigated acre. Of the total water diverted, 67,913 ac-ft was delivered to farms for a total of 3.37 ac-ft delivered per irrigated acre.

¹ Volume as measured at the Carlsbad Main Canal USGS Gaging Station. Data is provisional and subject to change.

Reservoir Storage Entitlements

All Carlsbad Project reservoirs were operated in accordance with the requirements of the Pecos River Compact and Flood Control Criteria of the Corps of Engineers.

The Corps of Engineers determines area and capacity tables for Santa Rosa Reservoir. Reclamation calculates annual total conservation storage entitlements for the Pecos River reservoirs that are in New Mexico. The following table represents 1999 storage entitlements for the four Pecos River Reservoirs:

Reservoir	Total Storage (ac-ft)	Min. Pool + Sed. Pool (ac-ft)	Entitlement Storage (ac-ft)	Entitlement Elevation (ft)
Santa Rosa	98,063	1,235	96,828	4,745.27
Sumner	43,768	7,962	35,806	4,261.00
Brantley	52,793	12,793	40,000	3,256.98
Avalon	4,466	600	3,866	3,177.40
TOTALS:	199,090	22,590	176,500	

Sumner Dam

Sumner Reservoir began the year with a total storage of 24,120 acre-feet, and an elevation of 4,252.68 feet. It reached a maximum storage of 42,230 acre-feet, with an elevation of 4,260.45 feet on March 2, and a minimum storage of 8,890 acre-feet, with an elevation of 4,241.65 feet on September 30. It ended the year with a storage of 19,460 acre-feet, and an elevation of 4,250.01 feet. Sumner did not exceed its maximum conservation storage in 1998. See Figure 1 for a graph of actual operations.

The year's first irrigation block release for Carlsbad Irrigation District (CID) from Sumner to Brantley, excluding water diverted into Fort Sumner Irrigation District's (FSID) Main Canal, took place between March 9 and 22, totaling 26,990 acre-feet. A second block release occurred between June 1 and 22, totaling 45,640 acre-feet. A third block release occurred between July 13 and 28, totaling 34,610 acre-feet. A fourth block release occurred between September 16 and 30, totaling 35,120 acre-

feet. The total water moved for CID from Sumner to Brantley was 142,360 acre-feet. A maximum release of 1,400 cfs occurred on September 25 and 26.

Under a water right permit granted by the State of New Mexico, CID is allowed to store up to an additional 20,000 acre-feet in Sumner Reservoir from November 1 to April 30 each year, provided that the accumulated conservation storage of all four reservoirs on the Pecos River in New Mexico does not exceed 176,500 acre-feet. No additional storage under this water right permit occurred in 1998.

Reclamation's Assumption of Sumner Dam Operations

On December 17, 1998, Reclamation assumed the operations of Sumner Dam from the CID, which had been operating the dam under the terms of the October 2, 1989 Agreement. This assumption of operations was related to non-irrigation season water operations required for compliance with the Endangered Species Act. Reclamation continues to operate the dam; the CID continues to be responsible for all maintenance activities.

Brantley Dam

Brantley Reservoir began the year with a total storage of 21,040 acre-feet, and an elevation of 3,244.86 feet. It reached a maximum storage of 47,990 acre-feet, with an elevation of 3,555.69 feet on March 28, and a minimum storage of 16,900 acre-feet, with an elevation of 3,242.45 feet on September 20. Brantley did not exceed its conservation storage in 1997. It ended the year at a storage of 34,770 acre-feet, and an elevation of 3,251.11 feet. See Figure 2 for a graph of actual operations.

A maximum release of 771 cfs occurred on July 22 during the first compact delivery to Texas. Release flows from Brantley varied throughout the year depending upon irrigation demand and compact delivery requirements. Flows did not fall below the required mitigation release of 20 cfs for fishery flows between Brantley and Avalon. The minimum release of 29 cfs occurred on July 7.

Avalon Dam

Avalon Dam is used to provide hydraulic head for diversion into the Carlsbad Main Canal. The reservoir began the year with a total storage of 2,420 acre-feet, and an

elevation of 3,174.90 feet. Diversions into the Carlsbad Main Canal began on March 23 and continued through October 27. A maximum diversion into the canal of 385 cfs occurred on June 19. The CID diverted a total of 95,940 acre-feet into the Carlsbad Main Canal during 1998.

From July 17 to 23, 5,110 acre-feet was released to the Pecos River for delivery to the State of Texas for Pecos River Compact purposes as part of the State of New Mexico's lease agreement program with CID. A second release of 16,820 acre-feet took place between October 24 and November 13. The total release to Texas for 1998 was 21,930 acre-feet. The peak release to the river was 451 cfs and occurred on October 26.

Carlsbad Irrigation District Proposed Title Transfer

In the fall of 1998, revised title transfer legislation (S.736) was introduced to the U.S. Senate. As did past bills, S.736 provided for the transfer of certain lands acquired by the U.S. Government in 1905 for the benefit of the Carlsbad Project, and the irrigation distribution system, to CID. The Administration went on record supporting this legislation, but Congress completed its session without acting on the bill. The exact same legislation (S.291) was reintroduced in the Senate on January 21, 1999.

PECOS RIVER BASIN WATER SALVAGE PROJECT

Activities

In 1998, under the authority of Public Law 88-594, Reclamation continued controlling salt cedar growth from the Sumner Dam area to the New Mexico-Texas state line excluding the area between the Artesia bridge and north boundary of Reclamation's Brantley lands. Reclamation continued to contract with the CID to execute the mechanical removal program. The majority of this work is now being performed by rubber-tire tractor with root plows which is possible because most of the large old-growth trees have already been removed. There do remain a few isolated old growth areas that have been inaccessible due to saturated ground conditions. Due to the extremely dry conditions during 1998, however, one normally inaccessible area was able to be cleared near the Texas state line utilizing bulldozers.

The New Mexico Interstate Stream Commission continued to support the Pecos River Basin Water Salvage Program by funding Reclamation's program to obtain easements

ENVIRONMENTAL COMPLIANCE ACTIVITIES

Endangered Species Program for Water Operations

During 1998, coordination continued among Memorandum of Understanding (MOU) signatories (Reclamation, CID, U.S. Fish and Wildlife Service (FWS), New Mexico Office of the State Engineer (OSE), and New Mexico Department of Fish and Game (NMDGF)) to wrap up research efforts, develop the flow model, and share findings. In the spring, FWS and NMDGF provided some preliminary recommendations for Sumner Dam operations.

In November 1998, Reclamation prepared a Biological Assessment in compliance with Section 7 of the Endangered Species Act which addressed the winter (November through February) operations of Sumner Dam. Reclamation submitted the Assessment to the FWS, which in turn issued a Biological Opinion shortly thereafter. The winter operations plan called for the bypass of a portion Sumner Lake inflows adequate to maintain an average flow of 35 cfs at the Acme Gage, 106 river miles downstream of Sumner Dam. These flows were achieved.

Reclamation entered into an agreement with the New Mexico Interstate Stream Commission (NMISC) on November 13, 1998. Reclamation agreed to "lease" water from the NMISC's *Water Resource Conservation Program; Pecos River Portion* for any additional net depletions caused by the winter operations that it could not make-up through other avenues. Reclamation applied to the OSE for an emergency permit to use a portion of water it obtained for the Brantley Project mitigation to offset additional net depletions. The permitting process is still ongoing and no water has been pumped from the mitigation wells to date.

National Environmental Policy Act (NEPA) Activities for Water Operations

During 1998, coordination continued among Reclamation and the cooperating agencies involved in the NEPA process: CID, FWS, NMDGF, OSE. [In early 1999, NMISC joined as a cooperator.] As work continued on writing portions of a draft Environmental Assessment, most efforts were focused on describing the No Action alternative and formulating alternative operations of Sumner Dam. Alternatives include providing some minimum level of river flow and restricting the timing, duration, frequency, magnitude and rate of change of irrigation releases. Details remain undefined as the NEPA team awaits full development of the flow model to test various scenarios.

National Environmental Policy Act (NEPA) Activities for Resource Management Plan

During 1998, the NEPA process was initiated for an Environmental Assessment of the Brantley and Avalon Reservoirs Resource Management Plan (RMP). The RMP is being developed to aid the management of land-based resources on Reclamation lands around Brantley and Avalon. Scoping of issues has been conducted and a planning work group has been formed to provide input to Reclamation staff.

PECOS RIVER ACTIVITIES AND OPERATIONS**Pecos River Model Development**

Development of a river and operations simulation computer model for the Pecos River continued in 1998. Reclamation is using the RiverWare model developed in a joint effort between Reclamation, the Tennessee Valley Authority (TVA), and the Center for Advanced Decision Support for Water and Environmental Systems (CADSWES). CADSWES is based at the University of Colorado at Boulder. Development of the RiverWare model for the Pecos River is on-going. During 1998, efforts continued with the development of a daily flow model with the application of the seasonal gain/loss flow table and Muskingum-Cunge routing. Reclamation has continued to contract the model development to FLO Engineering, a private consulting firm under contract with Reclamation, to assist Reclamation and CADSWES in the modeling effort. FLO Engineering performed extensive analysis of available data to develop gain/loss coefficients for specific reaches of the Pecos River. Tables for each reach are used by RiverWare to compute losses based on season and flow. Moreover, FLO Engineering has been working with CADSWES to assist with the implementation of the Muskingum-Cunge routing method to RiverWare. This routing methodology will be very valuable for modeling attenuation which is clearly exhibited in the flat reaches of the Pecos River. The Pecos River system was developed in RiverWare from Santa Rosa Lake to Avalon Reservoir. The model consists of eleven reaches including eight reaches between Sumner Dam and Brantley Reservoir. Diversions by the Fort Sumner Irrigation District (FSID) and the Carlsbad Irrigation District (CID) have been added to the model. Return flows from FSID are also considered. Extensive work has been completed to calibrate the reservoir objects. This included an analysis of Brantley bank storage; a new bank storage method was implemented to RiverWare for use in the Pecos River model. The model also performs evaporation computations for each reservoir.

The Pecos River RiverWare model will enable users to evaluate different flow scenarios for the Pecos River; thus, the effects of different operation scenarios designed for

recovery of the Pecos bluntnose shiner can be determined. Optimum operations can be determined which minimize the effects on making water deliveries and lead to recovery of the shiner. The model will simulate the total system storage for different operation plans. The current version of RiverWare does not estimate snowmelt or rainfall runoff into the Pecos River basin nor does it model groundwater. However, such data can be input to the RiverWare model and routed downstream.

The Pecos River system has been completed from Santa Rosa Lake to Avalon Reservoir, and the current model has been used to develop preliminary estimates for net depletions to the system from bypass releases made in 1998. Remaining work includes the development of operational rules for alternatives in the current Pecos River water operations NEPA process. In addition, any new data which become available will be used to refine the calibrated gain/loss coefficients. All new data which become available due to current bypass releases and other changes in operations will be extremely valuable since very little data are available for such operations. An unregulated flow analysis needs to be completed to develop the necessary input information to simulate scenarios for the NEPA alternatives. Model development will continue in 1999 to prepare for simulating scenarios for the NEPA process and for real-time operations.

Roswell Drainage District Technical Investigations

A Memorandum of Understanding was signed in May 1997 to establish commitments between OSE for data analysis, the Pecos Valley Artesian Conservancy District for monitoring of the wells, and Reclamation for well installation and data analysis.

Reclamation's Technical Service Center drillers installed 33 observation wells during 1997. These wells in addition to a few existing dairy wells are being monitored through 2002. Data collection is being performed by the Conservancy District and transmitted to the OSE and Reclamation for analysis.

A summary report for 1998 was prepared by Reclamation. One year of data is not enough to identify long term trends. However, the available data does provide some insight to the current shallow ground water conditions. Winter readings show two small areas where problems may be developing. An area of about 180 acres in the southern part of Section 16, T11S, R2E, and an area of about 200 acres in Sections 19 and 20, T11S, R2E are 4 feet or less to the water table at times during the year.

The August 1998 readings display a somewhat larger problem area probably exceeding 2,000 acres including all of Sections 17 and 20, and parts of Sections 7,8,9,16,18,19, and 29 all in T11S, R2E. Only a small part of this area is severely seeped at this time, but the entire area could benefit from drainage improvements.

A larger area will be involved if the water table rises another 2 feet in coming years, and a 4-foot rise would produce the conditions that originally led to the formation of the Drainage District. Whether these rises in water table will occur is not entirely clear at this time.

Emergency Management Program

Reclamation's Emergency Management Policies and Directives were finalized in 1996. They provide for safety of the public and protects environmental resources from incidents at Reclamation's storage dams. The directives require that the Emergency Action Plans (EAP) be rewritten for each dam to include initiating conditions, response levels, and expected actions. When each EAP is drafted and rewritten, a working draft EAP will be included in the Standing Operating Procedures (SOP) for each dam. Work is proceeding on the rewriting of the EAPs for Brantley, Avalon, and Sumner Dams.

Review of Operations and Maintenance (RO&M) Program

An RO&M examination was performed on the Carlsbad Irrigation District's distribution system in July, 1998. There were no recommendations that required immediate remedial actions.

Field examinations of the radial gates and outlet works access tunnel at Sumner Dam were performed by Reclamation's Technical Service Center in January, 1998 as a follow-up to exams performed in 1996 and 1997. Recommendations were made regarding concerns of the stability of the radial gates from corrosion and the cracking of the concrete that embeds the trunnion pins on the radial gates, possibly from corrosion of the anchors.

The additional sinkholes exposed downstream of the left end of Brantley Dam in 1997 were examined by Reclamation personnel from the area and regional offices, as well as the Technical Service Center. A preliminary monitoring program was established, with survey data taken. This program will be re-evaluated in 1999 during the Comprehensive

Facility Review process and then finalized. Currently this situation is not considered to be a dam safety issue.

Facility Review Program

There were no Facility Reviews conducted on Sumner, Brantley, and Avalon Dams in 1998. Annual inspections were performed on each dam, as required by Reclamation Manual Directives and Standards with no significant changes to previously reported conditions.

Safety of Dams (SOD) Program

The Corrective Action Study (CAS) decision document was finalized for Avalon Dam in 1997. The areas of concern that were identified were hydrologic and involve the upstream masonry wall which has open cracks and joints, and the area at the toe of the dam on the right side of Spillway No. 1, which during high flood flows could cause erosion of the toe of the dam. These two areas of concern are being evaluated as a part of the final design for the CAS, though little work was accomplished in 1998.

Pecos River Stream Adjudication

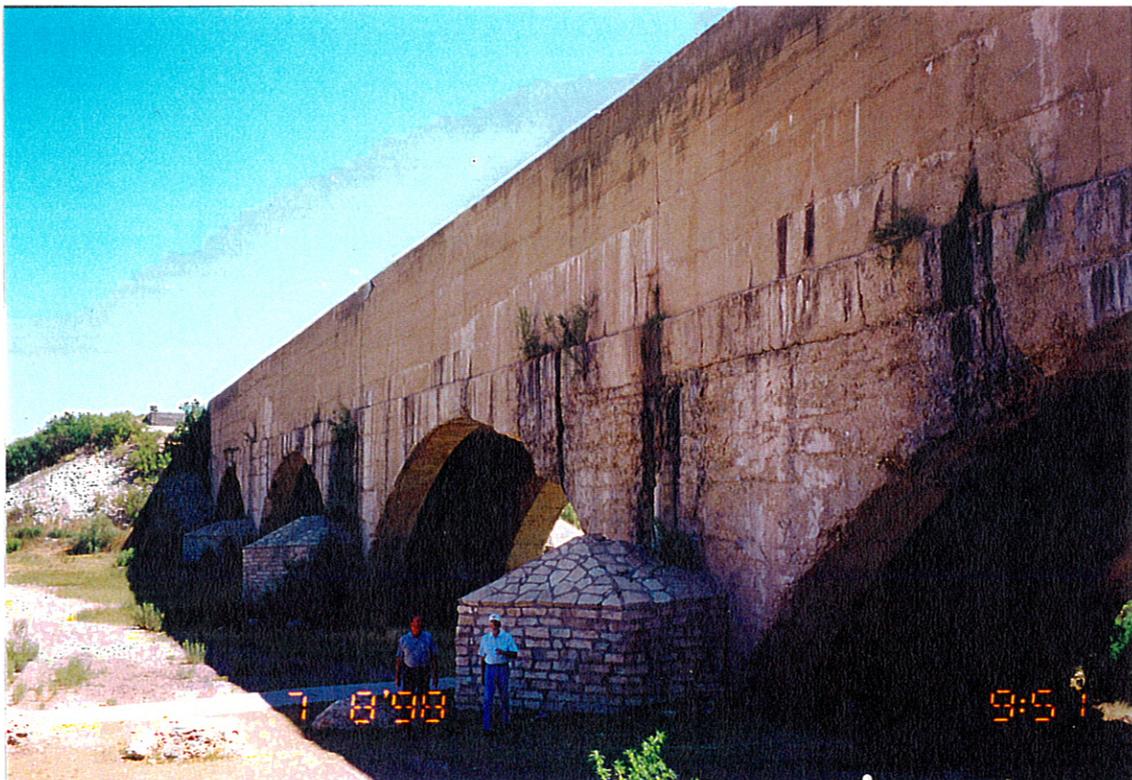
The Pecos River General Stream Adjudication (State Engineer v L.T. Lewis) is on-going in the 5th Judicial District Court in Chavez County. Reclamation is involved in this case as record title holder of the water rights for the Carlsbad Project. The U.S. recently filed briefs with the court arguing that the U.S.'s title to the water rights for the Project were determined by the United States District Court in the Hope Decree and that ruling is binding in these proceedings. The court has not yet ruled on this most recent filing.

Carlsbad Irrigation District Water Lease Program

Reclamation and CID entered into an agreement on April 14, 1998 which provided federal approval for the CID to lease project water to the New Mexico Interstate Stream Commission (NMISC) in 1998. This agreement was entered into under the authority of the Sale of Water for Miscellaneous Purposes Act of 1920. Immediately thereafter, pursuant to the terms of the Agreement, Reclamation approved the CID-NMISC contract, under which the NMISC leased 21,930 acre-feet which was delivered to the Texas state line. A second Agreement between Reclamation and CID was negotiated in November and December 1998 which stipulates minimum conditions for 5 years of CID-NMISC water lease contracts.



Masonry lined laterals on the Carlsbad Irrigation District's (CID) distribution system in Carlsbad, NM. This lateral and others on the CID system have been designated as part of the National Register of Historic Places. 7/9/98



The Pecos River flume, constructed in 1903, carries water for the Carlsbad Irrigation District's Main Canal over the Pecos River on the north end of Carlsbad, NM. The concrete in the flume is deteriorating but for the age of the structure is generally in fairly good condition. 7/8/98



A sinkhole that opened up after the wetter than normal winter and spring of 1996/1997. This sinkhole is located several hundred feet below Brantley Dam near Carlsbad, NM. The sinkhole measured about 28' across at the widest and was about 8' deep. This and other smaller sinkholes in the area are being periodically surveyed and visually monitored and are not considered to be a dam safety issue. 3/18/98

P H O T O G R A P H S

A N D

F I G U R E S

Figure 1

1998 SUMNER STORAGE AND RELEASES

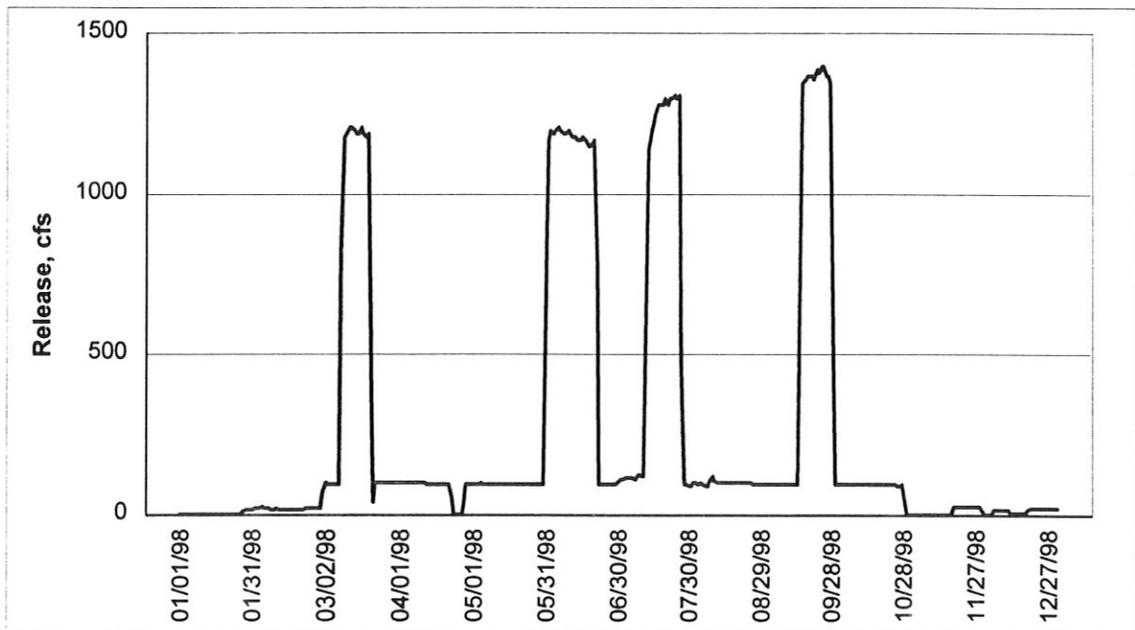
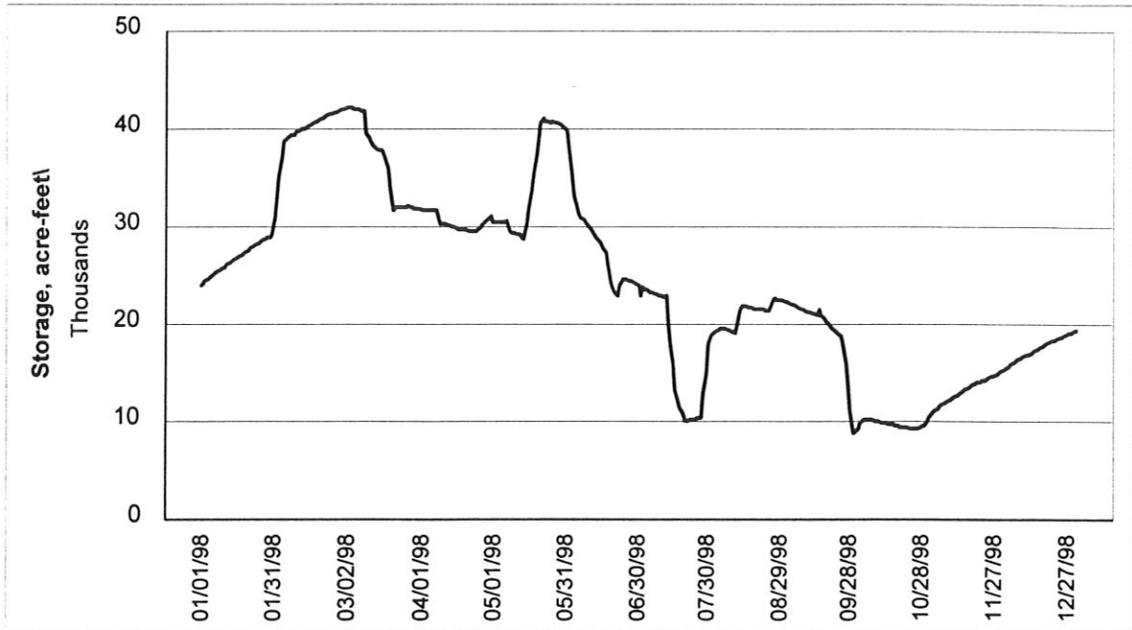


Figure 2

1998 BRANTLEY STORAGE AND RELEASES

