1995 Calendar Year Report to the

Pecos River Commission

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UNITED STATES DEPARTMENT of the INTERIOR

BUREAU of RECLAMATION

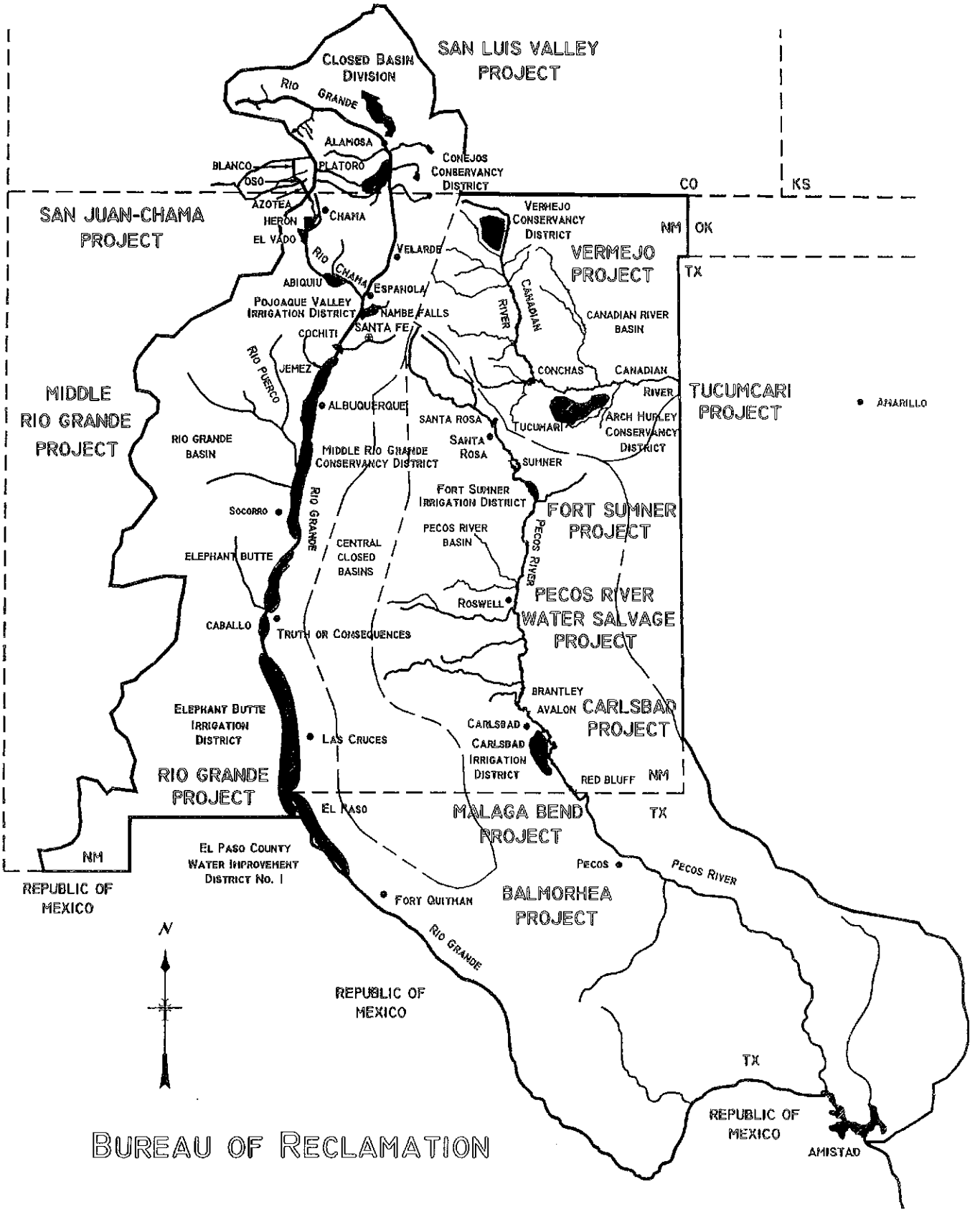
Upper Colorado Region

Albuquerque Area Office

April 4, 1996

ALBUQUERQUE AREA OFFICE

PROJECTS MAP - OCTOBER 1994



BUREAU OF RECLAMATION

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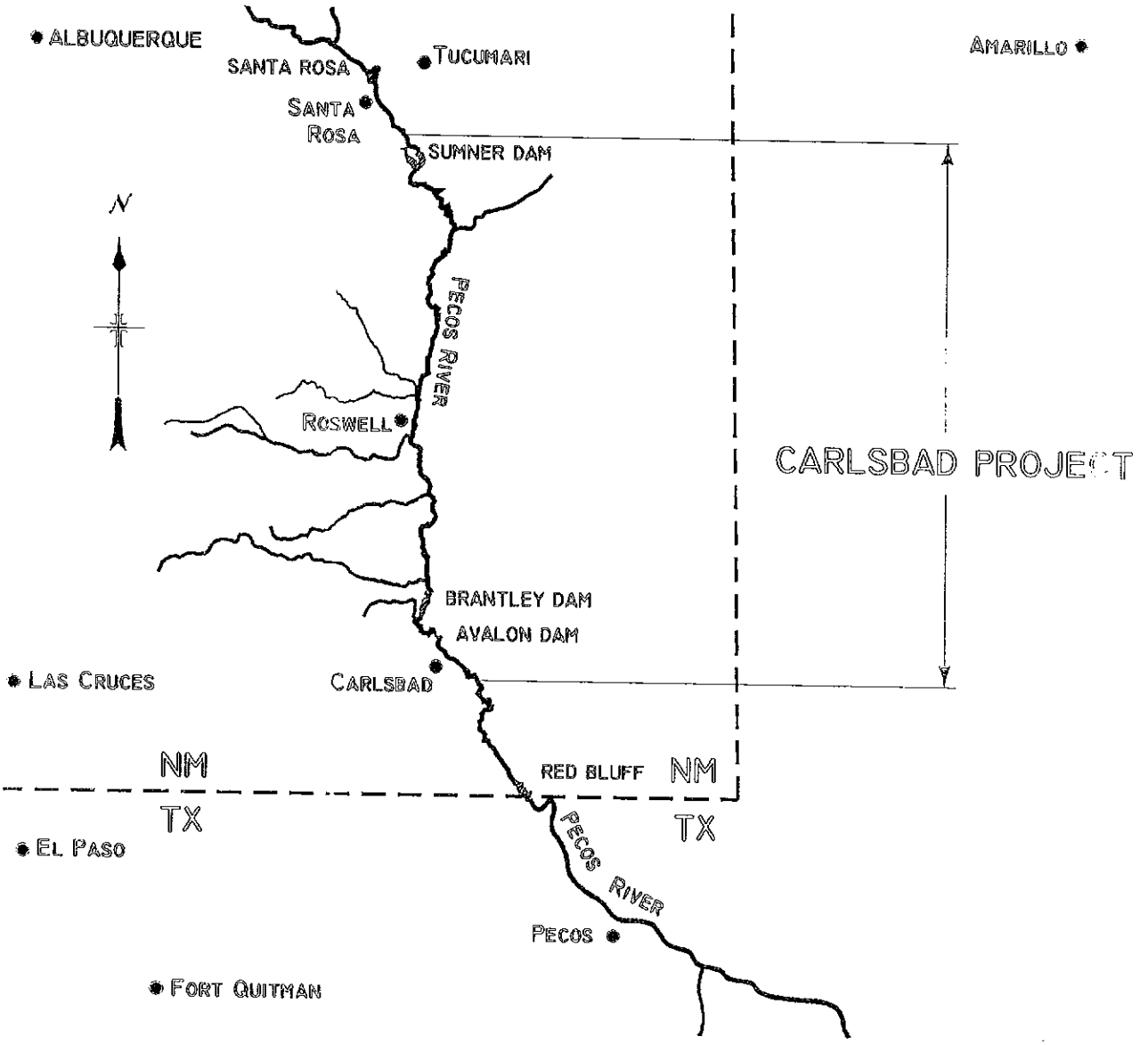
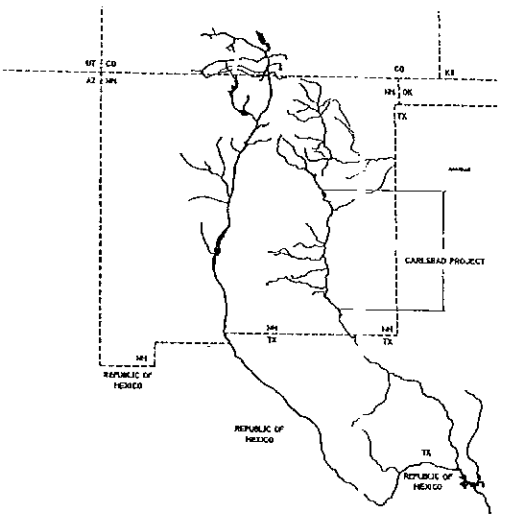
INTRODUCTION

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.

Beginning on July 1, 1995, reorganization of the Albuquerque Area Office realigned the portion of the Rio Grande Project above Percha Diversion Dam on the Rio Grande to be the responsibility of the Elephant Butte Field Division. The Rio Grande Projects Office in El Paso was realigned as the El Paso Field Division and is responsible for facilities of the Rio Grande Project from Percha Diversion Dam downstream to Amistad, Texas, and for coordinating study activities related to the Malaga Bend Salinity Alleviation Project. Both Field Divisions are under the jurisdiction of the Albuquerque Area Office.

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 1994. 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.





UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

ALBUQUERQUE AREA OFFICE

CARLSBAD PROJECT

JANUARY 1995

50 0 50 100

SCALE IN MILES

CARLSBAD PROJECT

Crop Production

A total of 102,254 acre-feet (ac-ft) was diverted during 1995 from the Pecos River by the Carlsbad Irrigation District (CID), as measured at the Carlsbad Main Canal Heading [1]. The major crops grown in 1995 were alfalfa hay and cotton. Out of a total of 25,055 acres of irrigable area, the total irrigated acres was 17,151. Total gross crop value was $8,636,693, with an average crop value of $503.57 per irrigated acre. The irrigation demand for 1995 was 107,110 ac-ft as reported by CID with 79,713 ac-ft delivered to farms or 4.65 ac-ft delivered per irrigated acre.

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.

Storage entitlements in 1995 were granted by the New Mexico State Engineer. The following table represents 1995 storage entitlements for the four Pecos River Reservoirs:

Reservoir	Total Storage (ac-ft)	Min. Pool + Sed. Pool (ac-ft)	Conservation Storage (ac-ft)	Conservation Elevation (ft)
Santa Rosa	101,765	7,053	94,712	4,746.27
Sumner	43,768	5,538	38,230	4,261.00
Brantley	48,517	8,517	40,000	3,255.84
Avalon	4,334	776	3,558	3,177.40
TOTALS:	198,384	21,884	176,500	

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

Sumner Dam

On January 1, 1995, Sumner Reservoir was at elevation 4,251.26 feet (ft). The total storage was 21,571 ac-ft, and conservation storage was 16,033 ac-ft. Under a water right permit granted by the State of New Mexico, CID is allowed to store up to an additional 20,000 ac-ft 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 ac-ft. No additional storage under this water right permit occurred in 1995.

On January 18, a 100 cfs release began out of Sumner Reservoir and continued until February 16. This release was done as part of the endangered species study on the threatened Pecos bluntnose shiner, as discussed in the Pecos River Activities and Operations Section below. On February 16, a ramped release to Brantley began. "Ramping" a release means that intermediate flow steps, such as 350 or 850 cubic-feet per second (cfs) are maintained for up four to eight days before the maximum step of roughly 1,100 cfs is reached. This release was necessary to improve water quality and increase water quantity in Brantley for the beginning of CID's irrigation season. The release began on February 16 with a 250 cfs flow until February 22, when the release was increased by 100 cfs for the Fort Sumner Irrigation District (FSID). The release eventually peaked at 1,120 cfs on March 3. The flows were ramped down beginning on March 5 until the release ended on March 8.

Fort Sumner Irrigation District's irrigation season typically begins March 1 and ends October 31. They are also allowed to divert for a two week period during the winter which is usually just prior to the March 1 irrigation season. During irrigation season, 80 to 100 cfs is usually released from Sumner Reservoir for FSID depending on demand or their available water right. In 1995, FSID began their releases on February 22.

The next Sumner release, excluding the 80 to 100 cfs to FSID, began on May 22 and continued until July 1. This release was made in response to irrigation demand from CID, and was also a ramped release.

Beginning on August 14 and continuing through September 10, an irrigation release was made to cover demand from Brantley for irrigation water and to assist the State of New Mexico in its delivery of water to the State of Texas for Pecos River Compact purposes. This release was not ramped so flows were immediately allowed to increase to approximately 1,100 cfs.

On November 1, the Sumner release for FSID ended for the winter. On November 27, a 45 to 50 cfs release began from Sumner as part of the study for the bluntnose shiner. This release continued through the end of 1995 and into 1996.

Sumner Reservoir ended the year at an elevation of 4,255.72 ft. The total storage was 30,402 ac-ft, and conservation storage was 24,864 ac-ft.

On July 26, the maximum pool elevation of 4,258.54 ft was reached. The total storage was 37,172 ac-ft, and conservation storage was 31,634 ac-ft. A minimum pool elevation of 4,250.28 ft occurred on September 8. The total storage was 19,907 ac-ft, and conservation storage was 14,369 ac-ft. A maximum release of 1,160 cfs was made on August 15 and August 22. Sumner Reservoir did not exceed its maximum conservation storage. Actual operations for Sumner Reservoir are shown on Figure 1.

Brantley Dam

On January 1, 1995, Brantley Reservoir was at elevation 3,245.53 ft. The total storage was 22,308 ac-ft, and conservation storage was 13,791 ac-ft. From January 1 to February 16, 20 cfs was released for periods lasting several hours. This occurred once every few days to maintain a wetted channel between Brantley and Avalon for fish populations. On February 16, CID began releases from Brantley Dam to refill Avalon Reservoir, which had been emptied through the winter, in preparation for irrigation season. Releases from Brantley during the irrigation season (which is generally from March 1 to October 31) varied from a minimum 25 cfs on October 20 to a maximum 790 cfs on July 13, depending on irrigation demand and compact delivery requirements.

After irrigation season, releases were reduced to 20 cfs for an average of eight hours once every 3 to 4 days. The release meets mitigation requirements for fishery flows between Brantley and Avalon while still allowing Avalon Reservoir to dry out. Brantley ended the year at elevation 3,248.65 ft. The total storage was 28,849 ac-ft and conservation storage was 20,332 ac-ft.

The minimum pool elevation occurred on August 19 and was 3,238.35 ft. The total storage was 11,291 ac-ft, and conservation storage was 2,774 ac-ft. The maximum pool elevation occurred on July 5 and was 3,254.37 ft. The total storage was 43,831 ac-ft, and conservation storage was 35,314 ac-ft. Brantley Reservoir did not exceed its conservation storage in 1995. Actual operations for Brantley Reservoir are shown on Figure 2.

Avalon Dam

Avalon Dam is used to provide hydraulic head for diversion into the Carlsbad Main Canal. Avalon Reservoir was drained during the winter of 1994-95 to control an aquatic weed. Refilling of Avalon began on February 16 with releases from Brantley Reservoir. Diversion into the Carlsbad Main Canal began on March 6 and continued through October 31. The maximum diversion into the canal was 385 cfs and occurred on June 15 and July 14. Carlsbad Irrigation District diverted a total of 102,254 ac-ft into the Carlsbad Main Canal during 1995. The reservoir reached its maximum level for the year from March 3 to March 6 at elevation 3,175.30 ft. The total storage was 2,557 ac-ft, and conservation storage was 1,781 ac-ft.

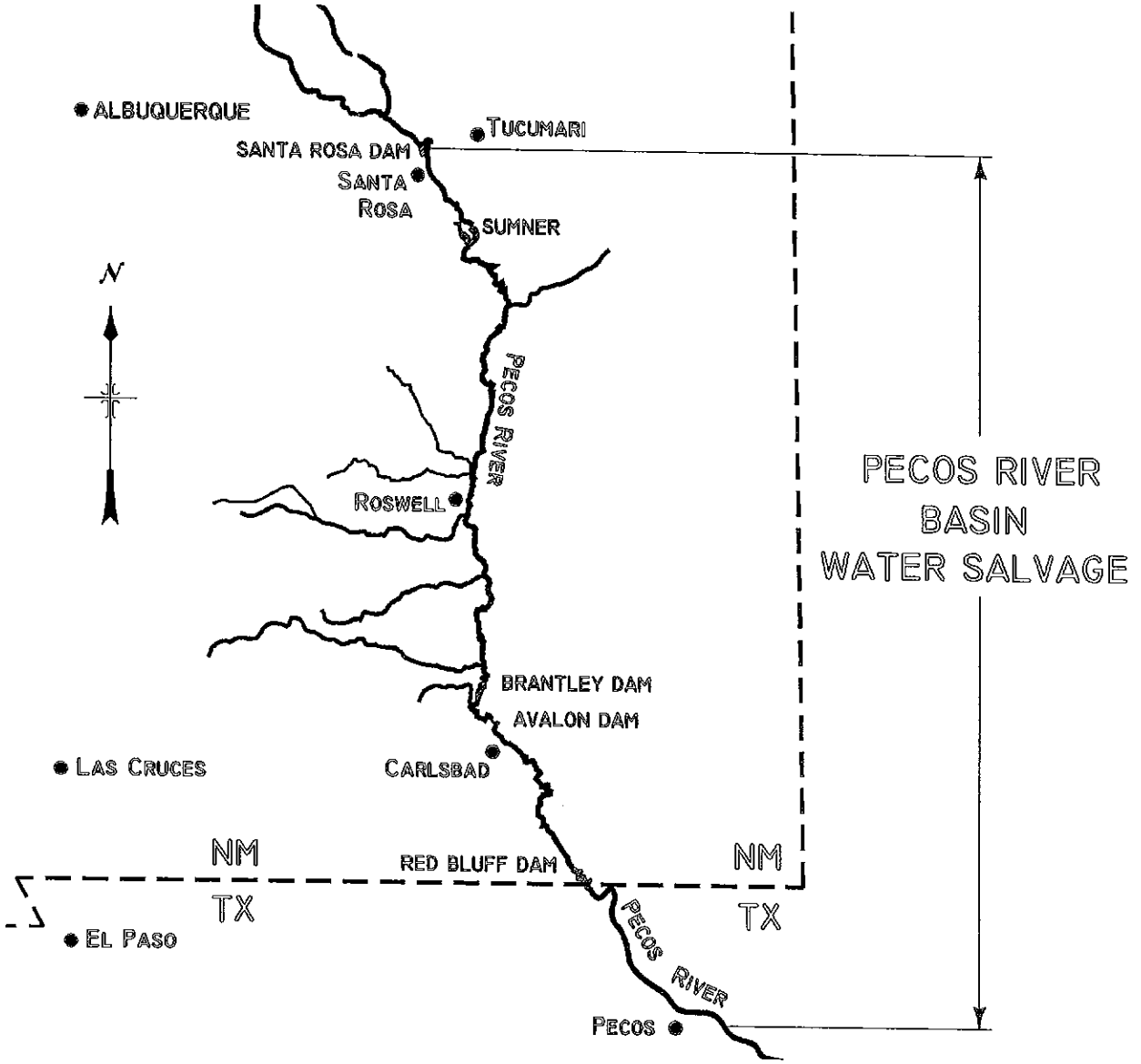
From July 10 to 27, 8,721 ac-ft was released to the Pecos River for delivery to the State of Texas for Pecos River compact purposes as part of the State of New Mexico's lease agreement program with CID. A second release of 8,217 ac-ft for the same purpose took place between October 6 and 20. The total release to Texas for 1995 was 16,938 ac-ft. The peak release to the river during these periods was 339 cfs and occurred on October 8.

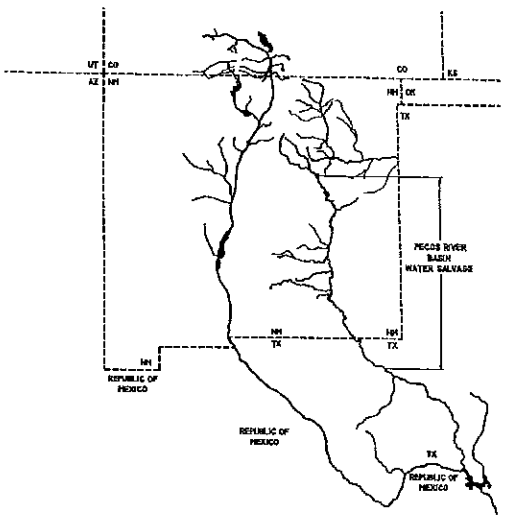
In November, CID completely drained Avalon Reservoir in an attempt to control an aquatic weed that could potentially cause maintenance problems for CID in the reservoir and irrigation system. In addition, the minimum release from Brantley was varied after November 1 to eliminate storage in Avalon Reservoir.

A sediment survey of Avalon Reservoir is planned for early 1996. It will consist of a combination of aerial photography and ground surveys. Once the survey is complete, and a new Area and Capacity table created, the 1996 conservation storage entitlements will be issued.

Land Acquisition Program

The land acquisition program for the Brantley Project is essentially complete. Only a few minor acquisitions, mineral subordinations, and access easements remain to be completed. Total land acquisition costs to date are just over $17 million.





UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

ALBUQUERQUE AREA OFFICE

PECOS RIVER BASIN WATER SALVAGE

JANUARY 1995

50 0 50 100

SCALE IN MILES

PECOS RIVER BASIN WATER SALVAGE PROJECT

Activities

Reclamation continued its annual saltcedar clearing which covers 53,750 acres in both Texas and New Mexico. On October 1, 1995, pursuant to an agreement with the State of Texas, the program was discontinued in Texas. Prior to October 1, Reclamation, through an agreement with the Carlsbad Irrigation District, removed vegetation in an area six miles above Sumner Reservoir in New Mexico through Red Bluff Texas which continued to old Highway 80 in Pecos, Texas. The remainder of Fiscal Year 1996 was solely for clearing in New Mexico. Extraordinary root plowing is not used with the heavy equipment now in New Mexico. Root plows attached to wheel tractors are used to accomplish this work.

Reclamation also continued the program, in cooperation with the New Mexico Interstate Stream Commission, to obtain easements to the lands being maintained under the water salvage program.

A total of 45 easements were acquired in 1995. Another 22 easements remain to be acquired. During 1995, many landowners refused to sign the easements. The easement form was subsequently revised and Reclamation will revisit the landowners that did not sign. The program is expected to be completed in 1996.

Biological Control of Salt Cedar

For the past several years the Albuquerque Area Office has cooperated with the Reclamation's Lower Colorado Regional Office and the U.S. Department of Agriculture in funding research aimed at controlling saltcedar by means of biological agents. The Department of Agriculture is the lead research agency, and would be responsible for obtaining compliance with the National Environmental Policy Act and all other federal and state statutes prior to initiation of test releases of insects. Laboratory and greenhouse tests have been completed for two insects: a Mealybug from Israel, and a Leaf beetle from China. The Department of Agriculture has determined that an Environmental Impact Statement (EIS) will be required prior to test releases of these insects in the field; a major concern is the impact that reduced saltcedar habitat may have on the Southwestern willow flycatcher, an endangered species whose range largely corresponds with the distribution of saltcedar, and which has recently been found to use saltcedar as nesting habitat when native riparian vegetation is unavailable. Consequently, test

releases of these insects have been delayed until the Department of Agriculture makes a decision whether or not to prepare an EIS.

FORT SUMNER PROJECT

Crop Production

A total of 43,744 ac-ft was diverted during 1995 from the Pecos River by the Fort Sumner Irrigation District (FSID), as measured at the FSID Main Canal Heading [2]. The four major crops grown in 1995 were alfalfa, hay, irrigated pasture, and sorghum. Fort Sumner Irrigation District reported that 5,948 acres were irrigated out of a total of 6,500 acres of irrigable area. Total gross crop value was $1,005,386 plus an additional revenue of $25,791 from Federal Agriculture and Conservation Stabilization Service (ASCS) payments resulted in an average crop value of $173.37 per irrigated acre. The irrigation demand for 1995 was 48,022 ac-ft as reported by FSID, with 33,616 ac-ft delivered to farms or 5.65 ac-ft delivered per irrigated acre.

Fort Sumner Irrigation District Water Management Activities

Reclamation continued to work with the FSID during 1995 on water management activities. Specifically, Reclamation looked at areas of high seepage losses in their canals. The investigation focused on the unlined sections on the Fort Sumner Main Canal and deteriorated portions of the High Line Canal. Lining portions of the canals is one solution to reducing high seepage losses and operational and maintenance expenses. Reduced conveyance losses would also increase water delivery efficiency thus reducing demands to the Pecos River system. Cost estimates were prepared, and a final report on this investigation should be available in April 1996.

In an effort to assist FSID in developing a more comprehensive water management plan, Reclamation is continuing to explore alternatives with FSID and New Mexico State Engineer Office staff. A water budget analysis of FSID's delivery system is planned for the near future.

[2] Volume as measured at the Fort Sumner Main Canal USGS Gaging Station. Data is provisional and subject to change.

PECOS RIVER ACTIVITIES AND OPERATIONS

Federally-Listed Species Work

In 1987, the Pecos bluntnose shiner was listed as a federally threatened species under the Endangered Species Act of 1973 with critical habitat designated in two approximately 60-mile reaches between Fort Sumner, New Mexico and Artesia, New Mexico. Reclamation subsequently entered into Section 7 consultation with the U. S. Fish and Wildlife Service (Service) to insure that Reclamation activities in the basin would not jeopardize continued existence of the Pecos bluntnose shiner or adversely modify its critical habitat. An outcome of the consultation was a Memorandum of Understanding (MOU) between Reclamation, the Service, New Mexico Department of Game and Fish (NMDGF), and Carlsbad Irrigation District (CID) to release, study, and protect flows of the Pecos River from Santa Rosa Dam to Brantley Reservoir for the benefit of the native fish community, especially the Pecos bluntnose shiner, and efficiently deliver water to downstream users. Analysis of flow effects on native fishes is required by the MOU. The MOU also requires development of a computer model to evaluate the effects of various operational scenarios on surface flows in downstream habitats, and system wide delivery efficiencies.

Each year of study, release scenarios from Sumner Dam are planned by all MOU signatories. Prior to the summer of 1995, Sumner releases were ramped at the beginning and end to simulate a more naturally-shaped hydrograph. Ramped releases were performed from 1992-1994 and during the late winter (February-March) and spring (May-June) releases in 1995. However, a decision was made to study the effects of the more historical release pattern, where releases from Sumner are brought up to 1,100 cfs immediately and left there until the desired quantity of water is released. The summer release (August-September) from Sumner Reservoir followed this historical pattern, called a "block" release.

Throughout the year, biological and hydrological data are collected at various locations along the Pecos River between Sumner Dam and Brantley Reservoir. For the hydrological study, there are now 12 continuous stream flow recorders on the main stem of the Pecos River, and one on each of the two FSID return flow drains (5 Reclamation and 9 USGS). During 1995, hydrological and water quality data was also collected from the three return canals at the Bitter Lake National Wildlife Refuge and at locations in the Pecos River immediately upstream of the river's confluence with these canals. Hydrological data were collected at all sites before, during, and after irrigation releases. Data collected between large irrigation releases (when Sumner releases are 100 cfs or less) will be used in river modeling

and studying the salinity behavior of the Pecos River. Other hydrological data collected during flow measurements are Manning's roughness coefficient and cross section geometries. Travel times at each flow rate to the different recorders are obtained from the recorder strip charts. Loss coefficients at the different river stations are calculated from strip chart information and streamflow measurements.

During 1995, water quality data collection continued in Brantley Reservoir including inflows and outflows. Depth profiles were measured at 12 stations in the reservoir, with readings taken every 5 ft, to monitor the changes of water quality (primarily total dissolved solids) that occur laterally and longitudinally within the reservoir and with depth.

Development of a river simulation computer model continued in 1995. Reclamation is using the PRSYM (Power and Reservoir System Model) framework to develop a Pecos version of PRSYM. The PRSYM development is a joint effort between Reclamation, Tennessee Valley Authority, and CADSWES (Center for Advanced Decision Support for Water and Environmental Systems), an organization based at the University of Colorado in Boulder. Development of PRSYM is on-going. During 1995, a new routing method (Muskingham-Cunge) was programmed into PRSYM. The main thrust of future modeling work will be to calibrate model results with existing data.

Geomorphological and biological data was collected during 1995 to evaluate the effects of Pecos River operations on the distribution and abundance of the Pecos bluntnose shiner, as well as other native and non-native fish communities, and on habitat of the Pecos bluntnose shiner. The studies focused on flow-related effects on the fish populations, habitat use and habitat availability. Channel morphology was characterized to assess the responsiveness of the river channel and ranges of depths and velocities available to the Pecos bluntnose shiner. Interactions between native and non-native fishes and between piscivorous and non-piscivorous fishes were also studied.

In addition to aiding Reclamation in developing improved water operation strategies that will efficiently deliver water and allow for recovery of the species, these collective hydrologic, biologic, and water quality studies will also benefit other interested water users in the Pecos River basin.

Seven Rivers Farm

To meet mitigation requirements associated with the Brantley Project, a waterfowl management area has been established at the Seven Rivers Farm, located approximately 15 miles northwest of Carlsbad, New Mexico. The property is being managed by the NMDGF.

The waterfowl management area consists of a 640-acre parcel of land that is being farmed to feed migratory waterfowl. Nearby backwater pools from Brantley Reservoir will provide water and resting areas for the seasonal wintering birds.

In March 1995, an application was made to transfer artesian ground water rights from Brantley Reservoir to the Seven Rivers property. To replace this water, application was made to transfer equivalent surface water rights from Karr Farm to Brantley Reservoir. Additional artesian water rights have also been acquired and moved to the Seven Rivers Farm to help meet the management area's additional water requirements. Karr Farm is an upland game area managed by NMDGF and located east of Artesia, New Mexico.

Pecos River Upper Watershed Water Quality Study

Reclamation, under the terms of a cost-sharing agreement with the New Mexico Institute of Mining and Technology (New Mexico Tech), completed its water quality field investigations in the Pecos River's upper watershed as well as snow pack study of several other high altitude watersheds affecting New Mexico from Telluride to Santa Fe. The study identified point and non-point sources of heavy metals contamination in the watershed from both regional atmospheric and local watershed sources. New Mexico Tech completed analysis of the data and a draft final report during 1995. Findings indicate a general regional pollution problem associated with regional windshed atmospheric deposition of heavy metals on all watersheds in the region. The final report has been delayed by resource constraints but should be completed during 1996.

MALAGA BEND SALINITY ALLEVIATION PROJECT

Current Status

A study and analysis of the downstream hydrologic benefits of three assumed levels of salt reductions at Malaga Bend was undertaken by Reclamation through its Technical Assistance to States Program.

Reclamation's Technical Services Center completed the study and presented the preliminary findings at the Annual Texas Interstate Compact Commissioners meeting on October 16 and 17, 1995. The report recommends gathering additional salinity data on Pecos River between Red Bluff Reservoir and Girvin, Texas. The Compact Commissioner for Texas encouraged follow-up studies that focus on the Pecos River salinity problem as it relates to the portion of the Pecos between Orla and Girvin, Texas.

Figure 1

1995 Sumner Elevation, Storage, and Releases

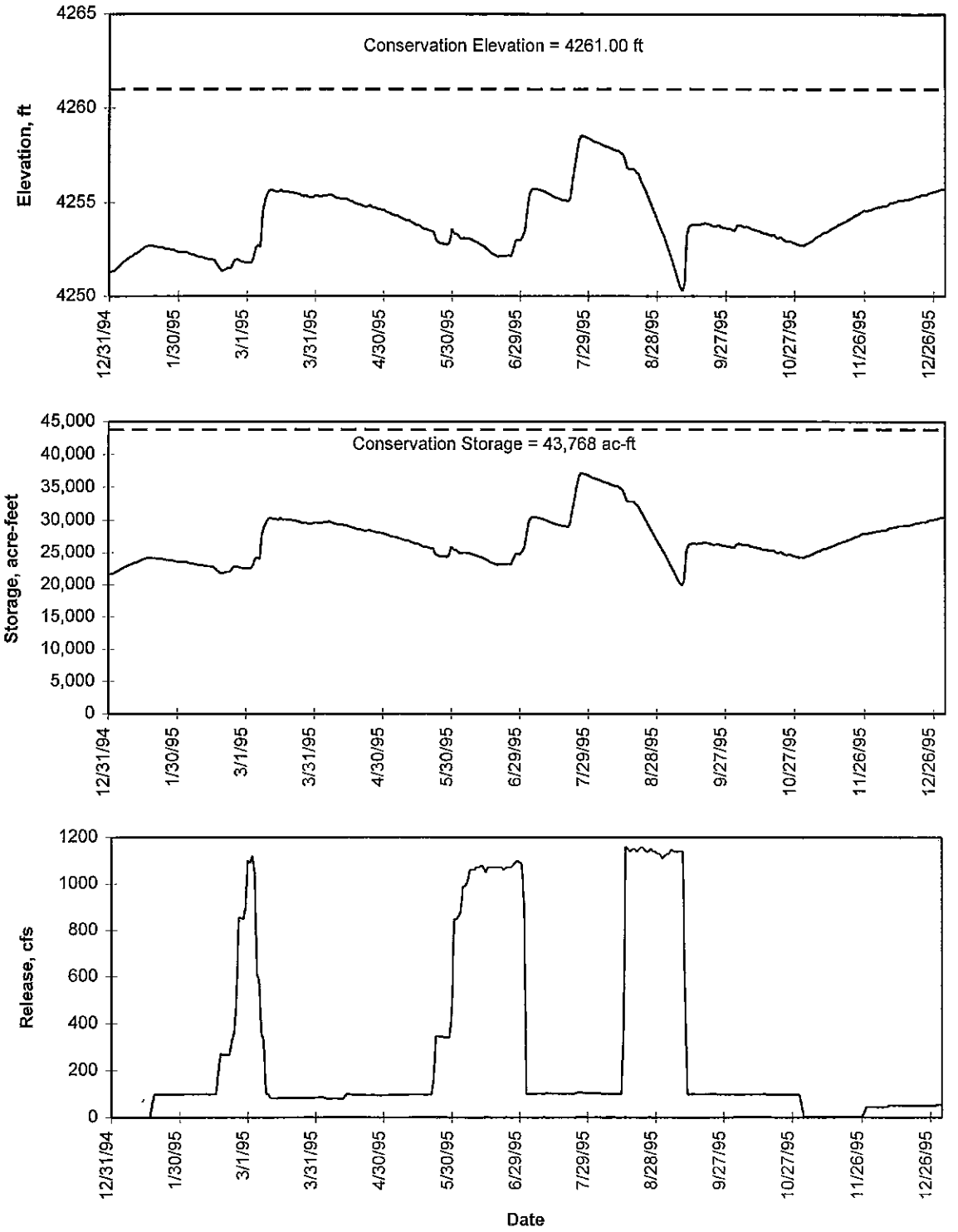
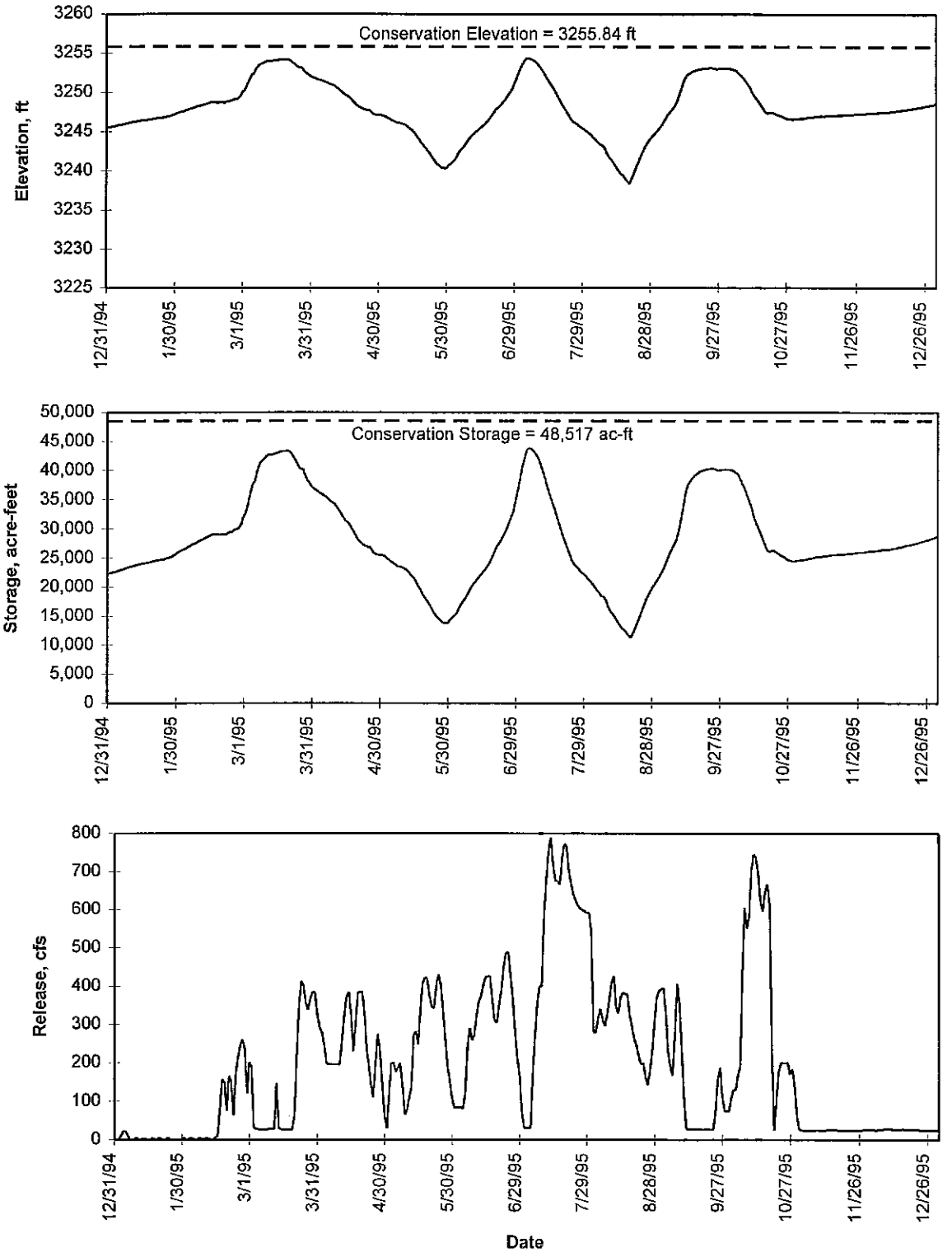


Figure 2

1995 Brantley Elevation, Storage, and Releases



FACSIMILE TRANSMITTAL HEADER SHEET

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TO: USBR Albuquerque Area office	Viola Sanchez	(505)248-5341	(505)248-5356

CLASSIFICATION	PRECEDENCE	NO. PAGES (Including this Header)	DATE-TIME	MONTH	YEAR	RELEASER'S SIGNATURE
		3	28-0920	2	96	Marc S. Sidlow

REMARKS: Viola - please review/comment on our PRC report - Santa Rosa operations. Also - what info do you have regarding rumored releases in April and July?

Space Below For Communications Center Use Only

DA FORM 3918-R, JUL 90 — DA FORM 3918-R, AUG 72 IS OBSOLETE — V3.00

Old Marc it looked good - briefed Lucas on reservoir operations.

- VJ 2/28/96

REPORT ON THE CIVIL WORKS ACTIVITIES OF THE ALBUQUERQUE DISTRICT CORPS OF ENGINEERS, IN THE PECOS RIVER BASIN DURING CALENDAR YEAR 1995

1. **General.** During calendar year 1995, activities of the U.S. Army Corps of Engineers, Albuquerque District, in the Pecos River Basin consisted of reservoir regulation, flood control related studies, flood plain management services, and the regulation of dredged or fill materials into waterways.

2. **Project Operation.**

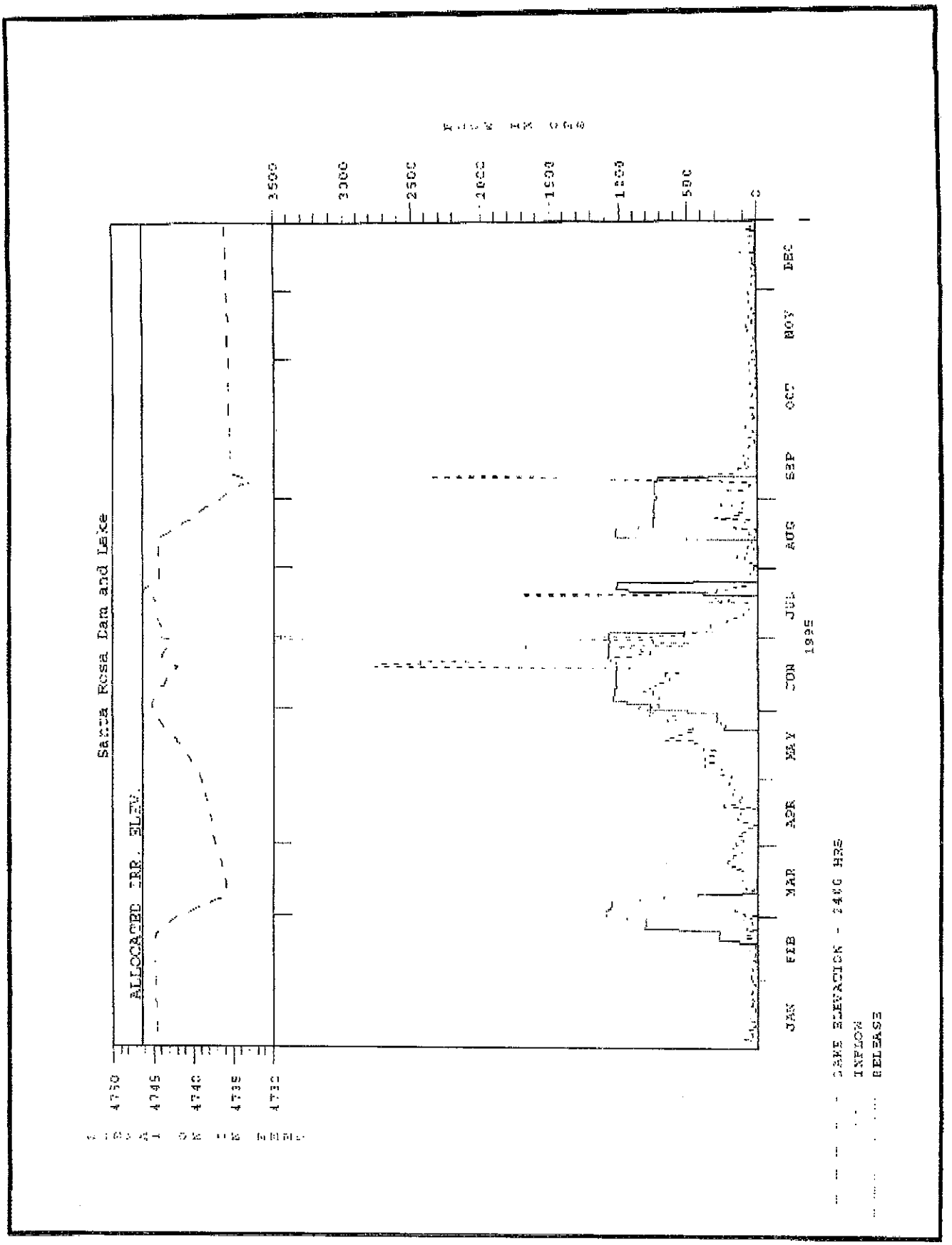
a. **Flood Control Operations.** Flood control efforts were not required at any of the Federal flood control reservoirs in the Pecos River Basin in 1995.

b. **Non-Flood Control Operations.**

(1) **Santa Rosa Lake.** Numerous releases were made for irrigation deliveries in 1995. Figure 1 shows the operation of Santa Rosa Lake during 1995. The first release started on February 16 and continued until March 10. Another release was initiated on May 22 and continued through July 3. Thunderstorm activity filled Santa Rosa Lake to its allocated irrigation entitlement on July 20, and releases were made for 5 days to create room for more possible rainfall runoff. Releases were again started on August 14 and continued until September 10. The maximum release for the year of 1,100 cubic feet per second (cfs) occurred on several occassions. The maximum pool elevation of 4,746.27 feet (101,755 acre-feet) occurred on July 20 and the minimum pool elevation of 4,732.82 feet (59,124 acre-feet) occurred on September 8. The pool elevation on December 31 was 4,736.22 feet (68,411 acre-feet).

(2) **Two Rivers Project.** We had one deviation in 1995, in which the inflow was stored in Rio Hondo Reservoir from February 23 through February 27, to assist the city of Roswell (Roswell) with repairs on a semi-collapsed sewer line. There were 77 acre-feet stored during this event and it was immediately released upon completion of the repair of the sewer line. The maximum flow during the release of the stored water was approximately 50 cfs.

A revised Two Rivers Reservoir Project Water Control Manual (WCM) was drafted and submitted for review in November. The currently approved WCM is dated April 1962. An inspection of the downstream channel was performed in conjunction with reviewing the flood control regulation stated in the WCM. A tour of the Rio Hondo was conducted on February 16, by personnel from the Corps, Chaves County Flood Control (CCFC) and Roswell. The tour revealed that the safe channel capacity below Two Rivers Project has been significantly reduced over the years, particularly at and above Diversion/Weir #3.


Santa Rosa Dam and Lake
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