

RECLAMATION ACTIVITIES IN NEW MEXICO

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It is always a pleasure to appear before this gathering of water conferees. I welcome the opportunity to return to my home state and to visit my alma mater while reporting to you on Reclamation activities in New Mexico.

OPERATING PROJECTS

Results represent the best proof of the value of any program, and Reclamation is no exception. So, let's look at some of those results in New Mexico. These are best illustrated by the Bureau's finished projects in the state - the Carlsbad, Fort Sumner, Hammond, Middle Rio Grande, Rio Grande, Tucumcari, and Vermejo projects.

These projects produced crops valued at more than \$44 million in 1967. About 40 percent of the cotton, 35 percent of all hay and silage, 75 percent of the commercial vegetables, 15 percent of the apples, and 100 percent of the pecans grown in New Mexico in 1966 were grown on Reclamation projects. Agriculture is a basic industry which requires many other supporting industries and one which produces new wealth so necessary for economic stability.

All of these projects are operated by water user organizations except the Middle Rio Grande and Rio Grande projects, which the Bureau operates with funds advanced by the water users.

While the completed projects are certainly successful from the irrigation standpoint, they have also provided subsidiary benefits in the way of fish and wildlife enhancement and recreation outlets. For example, more than 1,776,503 people visited Reclamation reservoirs in New Mexico last year.

LEAN YEARS

The history of Reclamation in the West is studded with success stories even though many difficulties have been encountered. Today, as it has for several years, our nation's involvement in Vietnam has necessitated a belt tightening on our domestic programs.

Yet even in these tight budget years, New Mexico has fared pretty well. We currently have three major projects under construction in the state - the San Juan-Chama, the Navajo Indian Irrigation, and the Pecos River Basin Water Salvage.

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San Juan-Chama Project

The San Juan-Chama project is designed to make possible an average annual diversion of about 110,000 acre-feet of water from the upper tributaries of the San Juan River in the Colorado River Basin, through the Continental Divide, for utilization in the Rio Grande Basin, New Mexico. The imported waters will provide municipal and industrial water for the city of Albuquerque and a supplemental supply for 121,000 acres of irrigated land.

Good progress was made on construction of features of the diversion and storage elements of the project during 1967.

El Vado Dam. All construction work was completed during 1967 on the new enlarged outlet works of El Vado Dam. We appreciate the Rio Grande Compact Commission's cooperation in permitting the use of Abiquiu Reservoir during construction of the El Vado Dam outlet works.

Azotea Tunnel. The contractor (Gibbons and Reed Company, Boyles Bros. Drilling Company, and Dugan Graham, Inc.) is excavating from both portals of the 13-mile-long Azotea Tunnel. The contractor has completed about 11.5 miles or 88 percent of tunnel excavation. Concrete lining was completed on approximately 3.2 miles of the tunnel from the outlet portal bringing the total length of tunnel lined to date to 5.2 miles or about 42 percent of the total. The concrete lining operation was shut down in October 1967 until it can be resumed from the inlet portal. All work under the contract was approximately 75 percent complete at the end of January.

Blanco Tunnel. The 9-mile-long Blanco Tunnel was holed through on March 30, 1967. The contractor (Colorado Constructors, Inc., and A. S. Horner Construction Company, Inc.) began concrete lining in August 1967; and about 1.9 miles of lining or 21 percent of the total has been completed. All work under the contract was approximately 79 percent complete at the end of January.

Oso Tunnel. Oso Tunnel was holed through on August 30, 1967. The contractor (Broyles Brothers Drilling Company) made excellent progress and excavated better than 6,000 linear feet of 10-foot 2-inch diameter tunnel per month from May through August on the 5-mile-long Oso Tunnel. Excavation through the glacial till encountered in the fall of 1966 was completed by conventional tunneling methods in April 1967. The contractor was able to return the mole to the heading April 23, 1967; and normal moling operations were resumed on May 1, 1967. The following new tunnel excavation records were set during this period: (1) monthly record - 6,851 linear feet in June; (2) 403 linear feet in a 24-hour day on June 16; and (3) 156 linear feet in an 8-hour shift on the graveyard shift June 19. Concrete lining of the tunnel was started in November,

and 3,900 feet of tunnel have been lined to date. Work on the Oso Diversion Dam was started in the fall of 1967 and was 10 percent complete by the end of December. All work under the contract was 69 percent complete at the end of January.

Channel of Azotea Creek. A \$378,156 contract was awarded in August 1967 for channelization work on 4 miles of Azotea Creek below the outlet of Azotea Tunnel. The contractor (Herren-Strong, Inc.) has completed 58 percent of the work to date. Channelization work on 5 miles of Willow Creek between Azotea Creek and Heron Reservoir is scheduled to be put under contract during the summer of 1968.

Heron Dam. Universal Constructors, Inc., of Albuquerque, was awarded an \$8,597,550 contract for construction of Heron Dam and relocating 8½ miles of State Highway No. 95 in September 1967. At the end of the year, the contractor had completed about 65 percent of the highway relocation, all of the open-cut excavation for the outlet works tunnel portals, and had begun tunnel excavation. Contract completion date is August 6, 1970; and work under the contract is presently 11 percent complete.

In this fiscal year of 1968 our construction budget for the San Juan-Chama project is \$13,755,000, and the President's program for fiscal year 1969 includes \$9,644,000 for the project.

Navajo Indian Irrigation Project

The Navajo Indian Irrigation project, a project of the Bureau of Indian Affairs, is being constructed in northwest New Mexico by the Bureau of Reclamation. This project is designed to divert water for irrigation from the existing Navajo Dam and Reservoir to 110,000 acres of land within and adjacent to the Navajo Indian Reservation, which will be developed for the Navajo Tribe.

The headwork and Tunnel No. 1 are complete; Tunnel No. 2 was holed through last July, and construction on this tunnel is about 77 percent complete. Approximately 37 percent of the construction of three siphons and two sections of open channel in the main canal has been completed.

The 1969 construction program calls for completion of Tunnel No. 2 and continuing work on two sections of the main canal. Additional contracts will be awarded as funds become available.

The project's budget for fiscal year 1968 is \$6,940,180; and the amount scheduled for fiscal year 1969 is \$3,548,000.

The Navajo Indian Irrigation project is approximately 15 percent complete.

Pecos River Basin Water Salvage Project

The Pecos River Basin Water Salvage project is designed as a continuing program for clearing and controlling the regrowth of salt cedars and other undesirable phreatophytes along the Pecos River south to below Pecos, Texas, which will reduce the nonbeneficial consumption of water in the basin.

The Pecos River Basin Water Salvage project is approximately 20 percent complete.

The first phreatophyte clearing contract was completed in August 1967 while the second one was completed just this month. A third contract covering clearing in the area where the Rio Hondo empties into the Pecos River was awarded in February 1968. A fourth contract covering clearing in the Lake Arthur area was awarded this month. Work is expected to be accomplished in the late spring to control growth in the area covered by the first clearing contract. To date, approximately 15,000 acres have been cleared under the above contracts.

The amount of \$620,000 was appropriated for our fiscal year 1968 program. The President's budget includes \$805,000 for our 1969 construction program. During fiscal year 1969, we expect to complete two phreatophyte clearing contracts. One additional major clearing contract will be started, and field data will be accumulated for future clearing work.

PROJECTS BEFORE CONGRESS

Congressional action may be forthcoming on other projects which could further alleviate the need for water in your state.

Animas-La Plata Project

The Animas-La Plata project is a multipurpose development proposed as a participating project of the Colorado River Storage project. It would be located in the San Juan River Basin in southwestern Colorado and northwestern New Mexico. The project would develop flows of the Animas-La Plata River systems for irrigation, municipal and industrial use, recreation, and fish and wildlife conservation. It would provide a full water supply for 14,700 acres and a supplemental supply for 5,500 acres in New Mexico. A much larger acreage would be irrigated in Colorado from the development.

Hooker Dam Project

The Hooker Dam project is a unit of the proposed central Arizona project for controlling and regulating erratic storm and winter season runoff, to

stabilize flows for downstream agricultural purposes, and for municipal and industrial uses in the Silver City and Tyrone areas. It would be located on the upper Gila River.

Congress is expected to take action on the central Arizona project legislation soon, and both the Animas-La Plata and Hooker Dam are included therein.

MUNICIPAL AND INDUSTRIAL WATER FOR NAVAJO PROJECT

Authorizing legislation for the Navajo Indian Irrigation project and the San Juan-Chama project provides that no long-term contract, except contracts for the benefit of the lands of the two projects, shall be entered into for delivery of water from Navajo Reservoir or waters of the San Juan River and its tributaries until the Secretary has made a hydrologic determination that there is sufficient water to reasonably meet these demands and fulfill the Upper Colorado River Basin Compact requirements. Any such long-term municipal and industrial contract must also be approved by Congress.

The Secretary has made the determination that sufficient water is reasonably likely to be available to permit contracting up to 100,000 acre-feet annually through the year 2005. Several such long-term contracts have been negotiated, and are currently under consideration by the congress.

PROJECTS IN PLANNING STAGE

While a good deal of satisfaction may be reaped from past accomplishments and current endeavors, the task of providing water as it is needed is a never-ending job. There are several projects which could well be undertaken during the next few years.

Eastern New Mexico Water Supply Project

One such development is the Eastern New Mexico Water Supply project, which is designed to augment the present groundwater supplies of the 11 project cities with surface water from the state's Ute Reservoir located on the Canadian River near Logan.

Water will be taken from Ute Reservoir and conveyed to the 11 cities through a system containing about 347 miles of pipeline, 14 pumping plants, six regulating reservoirs, regulating tanks, and other structures. If the Eastern New Mexico Water Supply Association decides it wants the Bureau to construct the project, the report now being prepared must be submitted to congress. It will take approximately 5 years to construct the project after it is authorized and money appropriated for construction.

Brantley Project

The Brantley project is being considered by our Bureau as the principal feature of a plan to help solve some of the existing and potential water problems on the Pecos River. The reservoir site is between existing McMillan and Avalon Dams. Under present-day technology we have determined that both of these dams have inadequate spillways. Construction of Brantley Dam and Reservoir would eliminate this threat and provide needed flood control not now available. In addition, the reservoir would provide replacement storage capacity for Lake McMillan to serve irrigation water to the Carlsbad Irrigation District lands. The Brantley report is now being reviewed in our Washington office.

Other Planning Activities

Feasibility investigations have continued on the Rio Grande Water Salvage project. A field draft of Volume I on phreatophyte clearing is nearing completion. Volume II will cover other aspects of possible water salvage including channelization, drainage, and consideration of clearing between levees. The evapotranspiration tanks in the Bernardo area have remained in operation.

Reconnaissance studies of the Rio Grande tributary areas included revisions to the Costilla report, completion of a field draft on the Jemez project report, and initiation of studies on the Cuba, Canjilon, and Los Encinos projects.

In our Rio Grande Basin studies, an evaluation of channel losses in various reaches of the Rio Grande continued. The basin investigation programs for the Rio Grande and Pecos are being reoriented and combined into a statewide study called the New Mexico Basins project, in which it is intended to develop the water picture for New Mexico.

Our research work on channel evaluation consisted of work on a report of the hydraulic characteristics of the low-flow conveyance channel extending from San Acacia to the narrows of Elephant Butte Reservoir and completion of a field draft of a report on aggradation-degradation of the Rio Grande from Cochiti to the headwaters of Elephant Butte Reservoir.

Work is just starting on a safety study for the middle Rio Grande project on possible measures to reduce drownings in the irrigation and drainage system.

West Texas and Eastern New Mexico Import Project

Another aspect of our planning for the future which is a subject of increasing interest and excitement is the West Texas and Eastern New Mexico Import project. The Bureau, the Mississippi River Commission, and the Corps of Engineers are currently studying possibilities of meeting the needs of west Texas and eastern New Mexico from the lower Mississippi River.

BETTER CONSERVATION

With respect to better conservation, the Bureau of Reclamation has two programs to help distribute and conserve present water supplies. They are the rehabilitation and betterment program and the small loan program as established by the Small Reclamation Projects Act of 1956.

Tucumcari Rehabilitation and Betterment

The Bureau constructed all of the Tucumcari project's irrigation facilities below the canal headworks at Conchas Dam on the Canadian during the early 40's. Early construction did not provide for project drainage which is now being taken care of through a \$1½ million rehabilitation and betterment program. This work, comprised of canal lining and drainage, was started in 1961 and will be completed in 1971. The conservancy district has contracted to perform all the work with a minimum of Bureau supervision. Specifications for the work are first approved by our office. Only one Bureau engineer is assigned to the project full time.

Carlsbad Rehabilitation and Betterment

The Carlsbad Irrigation District water users have voted to spend \$4 million for a rehabilitation and betterment program similar to that at Tucumcari. The proposed work involves replacement of 97 miles of earth laterals with either concrete pipe or concrete lining. The smaller ditches will be replaced with concrete pipe and the larger ones will be concrete-lined. Tentative plans are to begin a 5-year construction program in fiscal year 1969.

The Bureau will provide engineering assistance to the district and the necessary supervision and inspection.

Small Loans Program

The Small Reclamation Projects Act of 1956 as amended June 5, 1957, and September 2, 1966, established a program under which certain types of organizations can obtain loans for small Reclamation projects and grants for those portions of the projects that are nonreimbursable as a matter of national policy. The portion of the loan attributable to the irrigation is interest-free.

The limit of federal funds that may be provided is \$6,500,000 for a combination of a loan and a grant or for either. Grants may be made for flood control, recreation, and fish and wildlife purposes where these are of general public benefit. Such grants can be made up to a maximum of \$6,500,000 for a single project, but the combination of a loan and grant cannot exceed this amount.

LINED CONVEYANCE CHANNELS

At some point in time consideration should be given to carrying irrigation and municipal water supplies in lined conveyance channels or closed conduits in lieu of open river channels. Possible reaches of river for study are the Rio Grande from Cochiti Dam to Elephant Butte Reservoir and Elephant Butte through El Paso.

Such an undertaking would probably have to be limited to conveying only the low flows and consumptive use requirements. Maintenance of the river channel for floodflows and periods of high runoff would have to be continued.

The value of water will increase with increased demand. When the value equals or exceeds the cost of water saved through conveyance channels, then construction of these channels will be given serious consideration.

We know that water losses, because of percolation to the underground evaporation, and transpiration by phreatophytes, are very substantial. Not only are these water losses high, but current measures for combating these losses are costly.

RECLAMATION STORY IN NEW MEXICO

This, then, is the story of Reclamation in New Mexico, past, present, and future. Much as a river carves its path through the countryside, so has Reclamation carved an important niche for itself in the history of your state.