

FORTY-SECOND ANNUAL REPORT

OF THE

Upper Colorado
River Commission



SALT LAKE CITY, UTAH

SEPTEMBER 30, 1990

FISH & WILDLIFE
ENHANCEMENT

APR -9 91

FORTY-SECOND ANNUAL REPORT

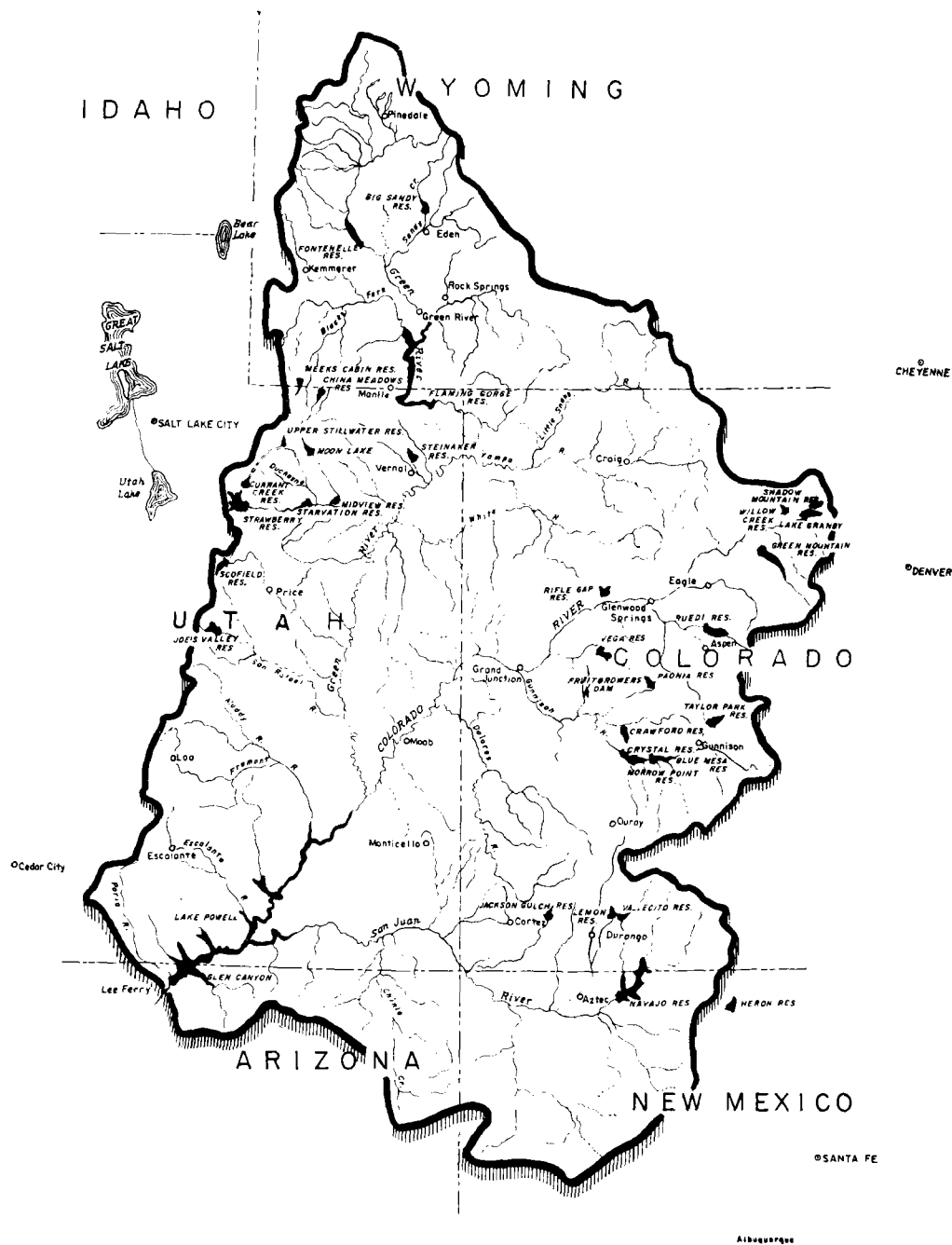
OF THE

Upper Colorado
River Commission



SALT LAKE CITY, UTAH

SEPTEMBER 30, 1990



UPPER COLORADO RIVER BASIN

UPPER COLORADO RIVER
COMMISSION

0 20 40 60
SCALE OF MILES



UPPER COLORADO RIVER COMMISSION

355 South Fourth East Street • Salt Lake City • Utah 84111 • 801-531-1150 • FAX 801-531-9705

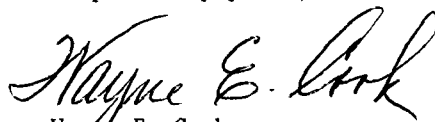
Mr. President:

The Forty-Second Annual Report of the Upper Colorado River Commission, as required by Article VIII(d)(13) of the Upper Colorado River Basin Compact, is enclosed.

The budget of the Commission for fiscal year 1992 (July 1, 1991 - June 30, 1992) is included in this report as Appendix B.

This report has also been transmitted to the Governor of each State signatory to the Upper Colorado River Basin Compact.

Respectfully yours,


Wayne E. Cook
Executive Director

The President
The White House
Washington, D. C. 20500

Enclosure

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PREFACE

Article VIII(d)(13) of the Upper Colorado River Basin Compact requires the Upper Colorado River Commission to “make and transmit annually to the Governors of the signatory States and the President of the United States of America, with the estimated budget, a report covering the activities of the Commission for the preceding water year.”

Article VIII(1) of the By-Laws of the Commission specifies that “the Commission shall make and transmit annually on or before April 1 to the Governors of the states signatory to the Upper Colorado River Basin Compact and to the President of the United States a report covering the activities of the Commission for the water year ending the preceding September 30.”

This Forty-Second Annual Report of the Upper Colorado River Commission has been compiled pursuant to the above directives.

This Annual Report includes, among other things, the following:

Membership of the Commission, its Committees, Advisers, and Staff;

Roster of meetings of the Commission;

Brief discussion of the activities of the Commission;

Engineering and hydrologic data;

Pertinent legal information;

Information pertaining to congressional legislation;

Map of the Upper Colorado River Basin;

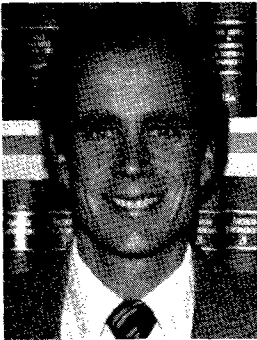
Status of the Storage Units and participating projects of the Colorado River Storage Project;

Appendices containing:

Fiscal data, such as: budget, balance sheet, statements of revenue and expense.

Transmountain diversions, etc.

COMMISSION



James S. Lochhead
Commissioner for
Colorado



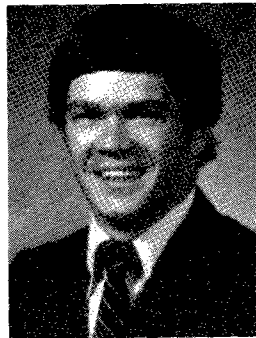
***Carl L. Slingerland**
Commissioner for
New Mexico



Jack F. Ross
Chairman
Commissioner for
United States



D. Larry Anderson
Commissioner for
Utah



Gordon W. Fassett
Commissioner for
Wyoming

* Appointed June 20, 1990

ALTERNATE COMMISSIONERS

| | |
|-------------------|---------------------|
| David W. Walker | State of Colorado |
| William J. Miller | State of New Mexico |
| Dallin W. Jensen | State of Utah |
| Dan S. Budd | State of Wyoming |
| Aaron H. McGinnis | State of Wyoming |

OFFICERS OF THE COMMISSION

| | |
|---------------------|----------------------|
| Chairman | Jack F. Ross |
| Vice Chairman | James S. Lochhead |
| Secretary | Wayne E. Cook |
| Treasurer | Ronald A. Schulthies |
| Assistant Treasurer | Rodney O. Chapman |

STAFF

| | |
|--------------------------|--------------------|
| Executive Director | Wayne E. Cook |
| General Counsel | Jane Bird |
| Chief Engineer | Clinton D. Stevens |
| Administrative Secretary | Hanna I. Wetmore |

COMMITTEES

The Committees of the Commission convened when required during the year. Committees and their membership at the date of this report are as follows (the Chairman and the Secretary of the Commission are ex-officio members of all committees, Article V(4) of the By-Laws):

Engineering Committee:

| | |
|-----------------------------|-------------------|
| Barry C. Saunders, Chairman | William J. Miller |
| Eugene I. Jencsok | Jay C. Groseclose |
| David H. Merritt | Robert L. Morgan |
| Jeris A. Danielson | John W. Shields |

Legal Committee:

| | |
|------------------------------|--------------------|
| Frank E. Maynes, Chairman | Peter White |
| Duane Woodard | Dallin W. Jensen |
| David W. Walker | Michael M. Quealy |
| Donald H. Hamburg, Alternate | Jennifer L. Gimbel |

Budget Committee:

| | |
|-----------------------------|---------------------|
| Gordon W. Fassett, Chairman | Carl L. Slingerland |
| David W. Walker | D. Larry Anderson |

ADVISERS TO COMMISSIONERS

The following individuals serve as advisers to their respective Commissioner:

COLORADO

Legal:

David W. Walker, Acting Director
Colorado Water Conservation Board
Denver, Colorado

Frank E. Maynes
Attorney at Law
Durango, Colorado

Duane Woodard
Attorney General
State of Colorado
Denver, Colorado

Donald H. Hamburg
General Counsel
Colorado River Water
Conservation District
Glenwood Springs, Colorado

Engineering:

Eugene I. Jencsok
Colorado Water Conservation Board
Denver, Colorado

David H. Merritt
Colorado River Water
Conservation District
Glenwood Springs, Colorado

Jeris A. Danielson
State Engineer
Denver, Colorado

NEW MEXICO

Legal:

Peter White
General Counsel
New Mexico Interstate Stream
Commission
Santa Fe, New Mexico

Engineering:

William J. Miller
Interstate Stream Engineer
New Mexico Interstate Stream
Commission
Santa Fe, New Mexico

Jay C. Groseclose
New Mexico Interstate Stream
Commission
Santa Fe, New Mexico

UTAH

Legal:

Dallin W. Jensen
Salt Lake City, Utah

Michael M. Quealy
Assistant Attorney General
Salt Lake City, Utah

Engineering:

Barry C. Saunders
Associate Director
Division of Water Resources
Salt Lake City, Utah

Robert L. Morgan
State Engineer
Division of Water Rights
Salt Lake City, Utah

General Advisers:

Don A. Christiansen, Manager
Central Utah Water Conservancy
District
Orem, Utah

David Rasmussen, Manager
Uintah Water Conservancy
District
Vernal, Utah

WYOMING

Legal:

Jennifer L. Gimbel
Assistant Attorney General
Cheyenne, Wyoming

Engineering:

John W. Shields
Water Resources Engineer
Interstate Streams Division
Cheyenne, Wyoming

General Adviser:

George L. Christopoulos
Cheyenne, Wyoming

MEETINGS OF THE COMMISSION

During the Water Year ending September 30, 1989, the Commission met four times as follows:

| | |
|---------------------------------------|---|
| Meeting No. 208 November 16, 1989 | Adjourned Annual Meeting Albuquerque, New Mexico |
| Meeting No. 209 March 19, 1990 | Regular Meeting Salt Lake City, Utah |
| Meeting No. 210 September 17, 1990 | Annual Meeting Salt Lake City, Utah |
| Meeting No. 211 September 20, 1990 | Adjourned Regular and Adjourned Annual Meeting Salt Lake City, Utah |

ACTIVITIES OF THE COMMISSION

Within the scope and limitations of Article I(a) of the Upper Colorado River Basin Compact, ". . . to secure the expeditious agricultural and industrial development of the Upper Basin, the storage of water . . ."and under the powers conferred upon the Commission by Article VIII(d) pertaining to making studies of water supplies of the Colorado River and its tributaries and the power to ". . . do all things necessary, proper or convenient in the performance of its duties . . . , either independently or in cooperation with any state or federal agency,"the principal activities of the Commission during the 1989 water year have consisted of: (A) research and studies of an engineering and hydrologic nature of various facets of the water resources of the Colorado River Basin especially as related to operation of the Colorado River reservoirs and salinity control; (B) collection and compilation of documents for a legal library relating to the utilization of waters of the Colorado River System for domestic, industrial and agricultural purposes, and the generation of hydroelectric power; (C) legal analyses of associated laws, court decisions, reports and problems; (D) analyses of environmental statements on water development projects of the Colorado River Storage Project and participating projects; (E) continuation of a general public relations program related to water resources of the Upper Colorado River Basin; (F) cooperation with water

quality and water resources agencies of the Colorado River Basin States on water and water-related problems; (G) an education and information program designed to aid in securing appropriations of funds by the United States Congress for the construction, planning and investigation of storage dams, reservoirs and water resource development projects of the Colorado River Storage Project that have been authorized for construction and to secure authorization for the construction of additional participating projects as the essential investigations and planning are completed; and (H) a legislative program consisting of the analysis and study of water resource bills introduced in the U.S. Congress for enactment, the preparation of evidence and argument, and the presentation of testimony before the Committees of the Congress.

A. ENGINEERING — HYDROLOGY

1. COLORADO RIVER SALINITY PROGRAM

The Upper Colorado River Commission has continued its interest and involvement in the Colorado River Basin salinity problem. The Commission staff has worked with representatives of the Commission's member States in coordinating and correlating activities with other State and Federal agencies, particularly the Colorado River Basin Salinity Control Forum, which is composed of representatives from the seven Colorado River Basin States. The Forum has developed water quality standards and a plan of implementation to meet the Environmental Protection Agency Regulation (40 CFR Part 120, Water Quality Standards-Colorado River System: Salinity Control Policy and Standards Procedures).

Section 303 of the Clean Water Act requires that water quality standards be reviewed from time to time and at least once during each three-year period.

The Forum in 1990 reviewed the existing State-adopted and Environmental Protection Agency-approved numeric salinity criteria and found no reason to recommend changes for the three lower mainstem stations.

The values are:

| | <i>Salinity in</i> <i>mg/l</i> |
|------------------------|-----------------------------------|
| Below Hoover Dam | 723 |
| Below Parker Dam | 747 |
| Imperial Dam | 879 |

The Forum is continuing to study salinity conditions and to develop new salinity projections. The Forum is also developing flow versus salt load relationships that will reflect present and anticipated conditions.

Salinities at each of the three lower mainstem stations for which numeric criteria have been established have decreased since 1972.

2. FORECAST OF STREAM FLOW

The April 1, 1990 forecast of inflow to Lake Powell by the National Weather Service, Department of Commerce, for April-July was estimated to be 3,600,000 acre-feet.¹ The unregulated inflow to Lake Powell for the period April-July 1990 amounted to 3,211,000 acre-feet², which was about 41 percent of the 28-year (1963-1990) average flow.

During the April-July 1990 period, changes in storage in Colorado River Storage Project reservoirs including Lake Powell resulted in an overall increase of 182,000 acre-feet, with 258,000 acre-feet of evaporation and a 5,000 acre-foot decrease in bank storage.³

Actual regulated inflow to Lake Powell for the period April-July 1990 was 3,210,000 acre-feet.

For the period October 1, 1989 through September 30, 1990, the change in reservoir storage, excluding bank storage and evaporation, at selected reservoirs above Lake Powell was: Fontenelle decreased 6,500 acre-feet; Flaming Gorge increased 121,700 acre-feet; Taylor Park decreased 4,800 acre-feet; Blue Mesa increased 33,700 acre-feet; Morrow Point increased 700 acre-feet; Crystal increased 400 acre-feet; and Navajo increased 51,000 acre-feet.

¹ Including water to be stored upstream in other Colorado River Storage Project Reservoirs.

² Adjusted for upstream regulation and depletions.

³ Includes Flaming Gorge Reservoir on the Green River.

The virgin flow⁴ of the Colorado River at Lee Ferry⁵ for the 1990 water year amounted to 8,521,000 acre-feet.⁶

3. SUMMARY OF RESERVOIR LEVELS AND CONTENTS

Runoff⁷ during the year ending September 30, 1990 ranged from 42.0 percent of the 77-year (1914-1990) mean at the Colorado River station near Cisco, Utah to 44.7 percent of the 77-year mean at the Green River station at Green River, Utah. The volumes of runoff at these stations were 2,284,900 acre-feet and 2,023,500 acre-feet respectively. Runoff of the San Juan River station near San Juan, Utah totaled 826,400 acre-feet, which was 44.2 percent of the 77-year mean.

Lake Powell's lowest elevation of the 1990 water year occurred on September 29, 1990 when the lake level was at elevation 3,637.58 feet (live content 16,249,000 acre-feet). Lake Powell was at its highest point on October 1, 1989 at elevation 3,665.20 feet with a content of 19,805,000 acre-feet. A total of 8,251,000 acre-feet was released to the river below Glen Canyon Dam during the 1990 water year. The 1981-1990 (10-year) delivery to the Lower Basin (measured at Lee Ferry) was 128,280,000 acre-feet.

Lake Mead, on September 30, 1990, contained 20,143,000 acre-feet⁸ of available storage water at elevation 1,180.02 feet. On September 30, 1990, the live storage of Lake Mead was 3,891,000 acre-feet more than the storage in Lake Powell.

⁴ Virgin flow is the estimated flow of the stream if it were in its natural state and unaffected by the activities of man.

⁵ Lee Ferry, Arizona is the division point between the upper and lower basins of the Colorado River as defined in the Colorado River Compact. It is located about one mile downstream from the mouth of the Paria River and about 16 miles downstream from Glen Canyon Dam.

⁶ Based on provisional records subject to revision.

⁷ Adjusted for the change in storage in Colorado River Storage Project Reservoirs.

⁸ Based on April 1, 1967 Capacity Table revised according to Sedimentation Survey 1963-1964.

TABLE 1

STATISTICAL DATA FOR PRINCIPAL RESERVOIRS IN COLORADO RIVER BASIN

(Units: Elevation — feet; capacity — 1,000 acre-feet)

UPPER BASIN

Colorado River Storage Project
(Total Surface Capacity)

| | Fontenelle | | Flaming Gorge | | Taylor Park | | Blue Mesa | | Morrow Point | | Crystal | | Navajo | | Lake Powell | |
|--|------------|------|---------------|-------|-------------|------|-----------|------|--------------|------|---------|------|--------------------|-------|-------------|--------|
| | Elv. | Cap. | Elv. | Cap. | Elv. | Cap. | Elv. | Cap. | Elv. | Cap. | Elv. | Cap. | Elv. | Cap. | Elv. | Cap. |
| River elevation at dam (average tailwater) | — | — | 5,603 | 0 | 9,174 | 0 | 7,160 | 0 | 6,775 | 0 | 6,534 | 0 | 5,720 | 0 | 3,138 | 0 |
| Dead Storage | 6,408 | 0.56 | 5,740 | 40 | — | — | 7,358 | 111 | 6,808 | 0 | 6,670 | 8 | 5,775 | 13 | 3,370 | 1,998 |
| Inactive Storage (minimum power pool) | — | — | 5,871 | 273 | — | — | 7,393 | 192 | 7,100 | 75 | 6,700 | 12 | 5,990 ¹ | 673 | 3,490 | 6,124 |
| Rated Head | 6,491 | 234 | 5,946 | 1,102 | — | — | 7,438 | 361 | 7,108 | 80 | 6,740 | 20 | — | — | 3,570 | 11,426 |
| Maximum Storage (without surcharge) | 6,506 | 345 | 6,040 | 3,789 | 9,330 | 106 | 7,519 | 941 | 7,160 | 117 | 6,755 | 25 | 6,085 | 1,709 | 3,700 | 27,000 |

¹ Required for Navajo Indian Irrigation Project.

TABLE 2
STATISTICAL DATA FOR PRINCIPAL RESERVOIRS
IN COLORADO RIVER BASIN

(Units: Elevation — feet; capacity — 1,000 acre-feet)

LOWER BASIN

(Usable Surface Capacity)

| | Lake Mead | | Lake Mohave | | Lake Havasu | |
|---|-----------|----------|-------------|----------|------------------|----------|
| | Elv. | Capacity | Elv. | Capacity | Elv. | Capacity |
| River elevation at dam (average tailwater) | 646 | (-2,378) | 506 | (-8.5) | 370 | (-28.6) |
| Dead Storage | 895 | 0 | 533.39 | 0 | 400 | 0 |
| Inactive Storage (minimum power pool) | 1,050 | 7,471 | 570 | 217.5 | 440 ¹ | 439.4 |
| Rated Head | 1,122.8 | 13,633 | — | — | — | — |
| Maximum Storage (without surcharge) | 1,221.4 | 26,159 | 647 | 1,809.8 | 450 | 619.4 |

¹ Contractual minimum for delivery to Metropolitan Water District's Colorado River Aqueduct.

The results of the long-range reservoir operation procedures adopted by the Secretary of the Interior for Lake Powell, Flaming Gorge, Fontenelle, Navajo, and Blue Mesa reservoirs in the Upper Colorado River Basin and for Lake Mead in the Lower Basin are illustrated on pages 14-21 for the 1990 water year.

There was no equalization of storage as dictated by Section 602(a) of Public Law 90-537. The drawdown of Lake Powell was governed by factors other than the equalization criteria.

4. FLOWS OF COLORADO RIVER

Table 3 on pages 22 and 23 shows the estimated virgin flow of the Colorado River at Lee Ferry, Arizona for each water year from 1896 through 1990. Column (4) of the table shows the average virgin flow for any given year within the period computed through water year 1990. Column (5) shows the average virgin flow for a given year within the period computed since water year 1896. Column (6) shows the average virgin flow for each progressive ten-year period beginning with the ten-year period ending on September 30, 1905. The difference between the virgin flow for a given year and the average flow over the 94-year period, 1896 through 1990, is shown in Column (7).

Article III(d) of the Colorado River Compact stipulates that “the States of the Upper Division will not cause the flow of the river at Lee Ferry to be depleted below an aggregate of 75,000,000 acre-feet for any period of ten consecutive years reckoned in a continuing progressive series beginning with the first day of October next succeeding the ratification of this Compact.” Prior to the storage of water in the Colorado River Storage Project reservoirs, which began in 1962, the flow of the river at Lee Ferry in any ten consecutive years was greatly in excess of the 75,000,000 acre-feet required by the Compact. Beginning in 1962, Colorado River Storage Project reservoirs have regulated the river above Glen Canyon Dam. Table 4, on page 24, shows the historic flow at Lee Ferry for the period 1953 through 1990. The historic flow for each progressive ten-year period from 1953 through 1990, beginning with the ten-year period ending September 30, 1962, the commencement of storage in Colorado River Storage Project reservoirs, is shown in Column (3).

In each consecutive ten-year period, the total flow equaled or exceeded the 75,000,000 acre-feet required by the Compact. The flow at Lee Ferry during the ten-year period ending September 30, 1990 was 128,280,000 acre-feet.

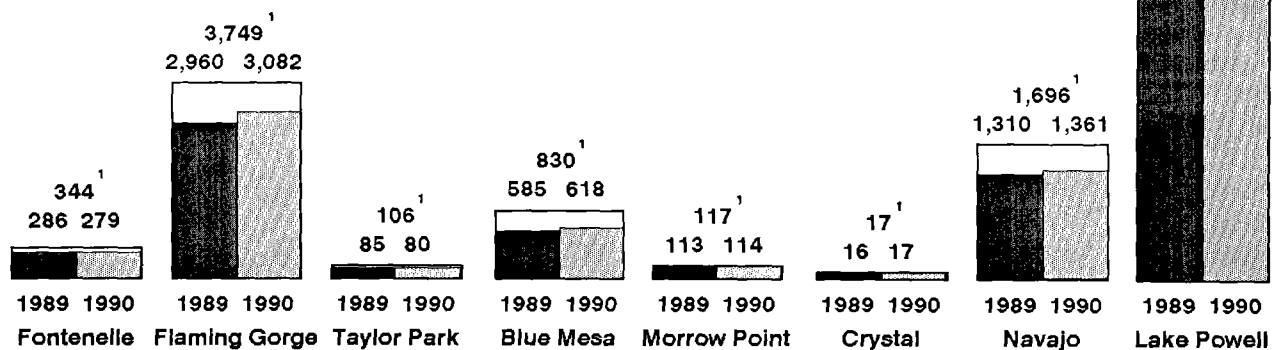
Storage in Principal Reservoirs at the End of Water Year 1990

Upper Basin

Live Storage Contents *

(1,000 Acre-feet)

| | Sept. 30 1989 | Percent Live Capacity | Sept. 30 1990 | Percent Live Capacity | Change in Contents |
|---------------|------------------|--------------------------|------------------|--------------------------|-----------------------|
| Fontenelle | 286 | 83 | 279 | 81 | -7 |
| Flaming Gorge | 2,960 | 79 | 3,082 | 82 | 122 |
| Taylor Park | 85 | 80 | 80 | 75 | -5 |
| Blue Mesa | 585 | 70 | 618 | 74 | 33 |
| Morrow Point | 113 | 97 | 114 | 97 | 1 |
| Crystal | 16 | 94 | 17 | 100 | 1 |
| Navajo | 1,310 | 77 | 1,361 | 80 | 51 |
| Lake Powell | 19,805 | 79 | 16,252 | 65 | -3,553 |
| TOTAL | 25,160 | 79 | 21,803 | 68 | -3,357 |



* As of September 30, 1990 (excludes bank storage)

¹ Maximum live storage (exclusive of surcharge)

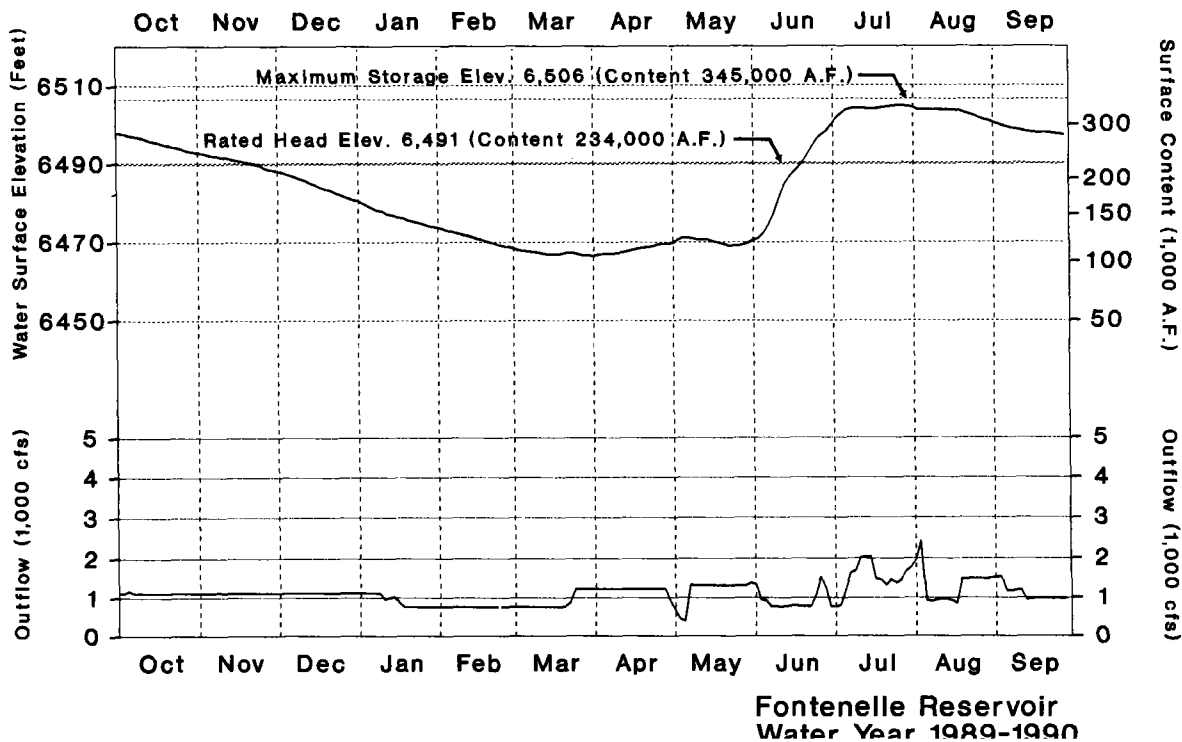


FONTENELLE

Live Storage Capacity - 344,400 acre-feet

Power Generating Capacity - 13,000 KW

Live Storage 9/30/89 - 286,000 acre-feet



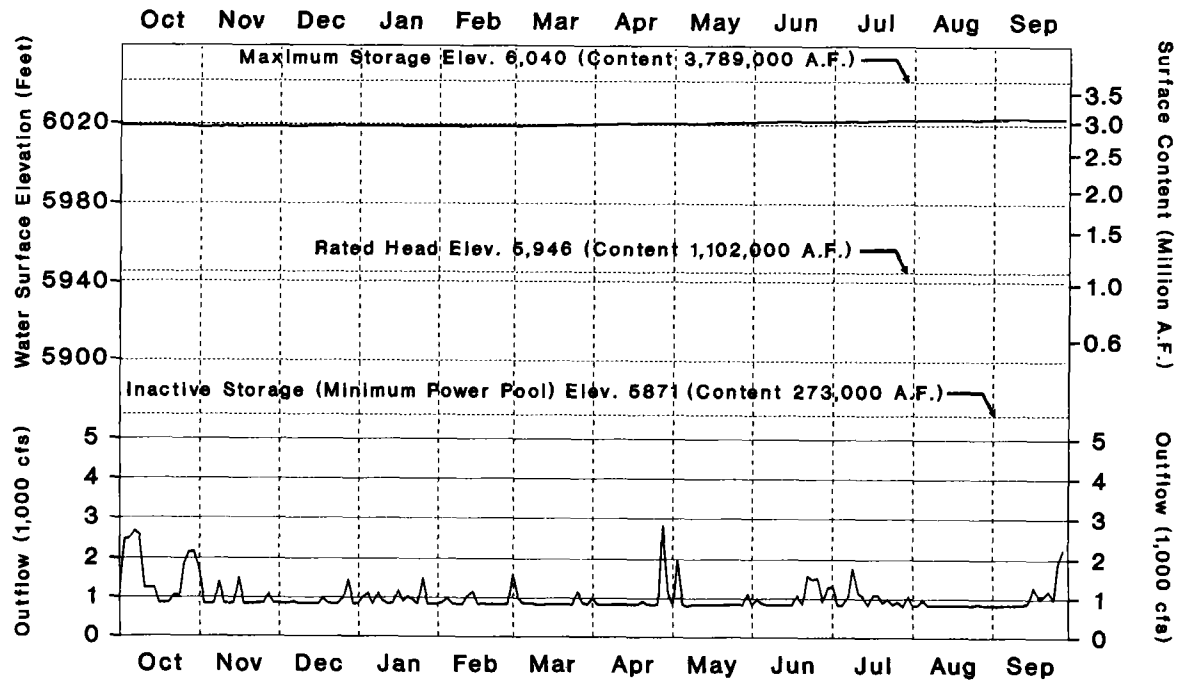


FLAMING GORGE

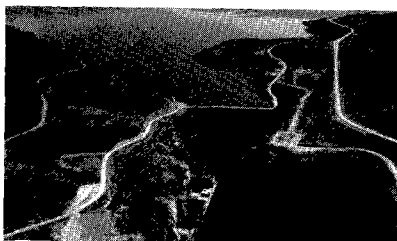
Live Storage Capacity - 3,749,000 acre-feet

Power Generating Capacity - 144,000 KW

Live Storage 9/30/89 - 2,960,000 acre-feet



Flaming Gorge Reservoir
Water Year 1989-1990

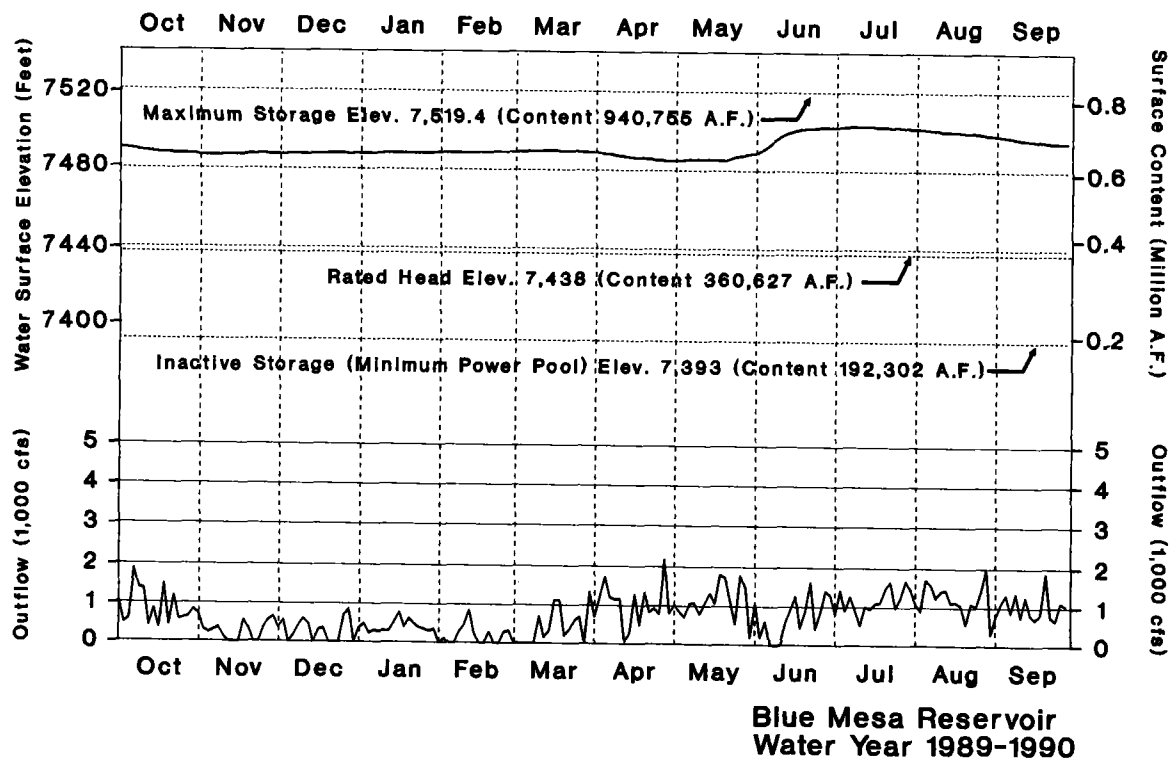


BLUE MESA

Live Storage Capacity - 830,000 acre-feet

Power Generating Capacity - 96,000 KW

Live Storage 9/30/89 - 585,000 acre-feet



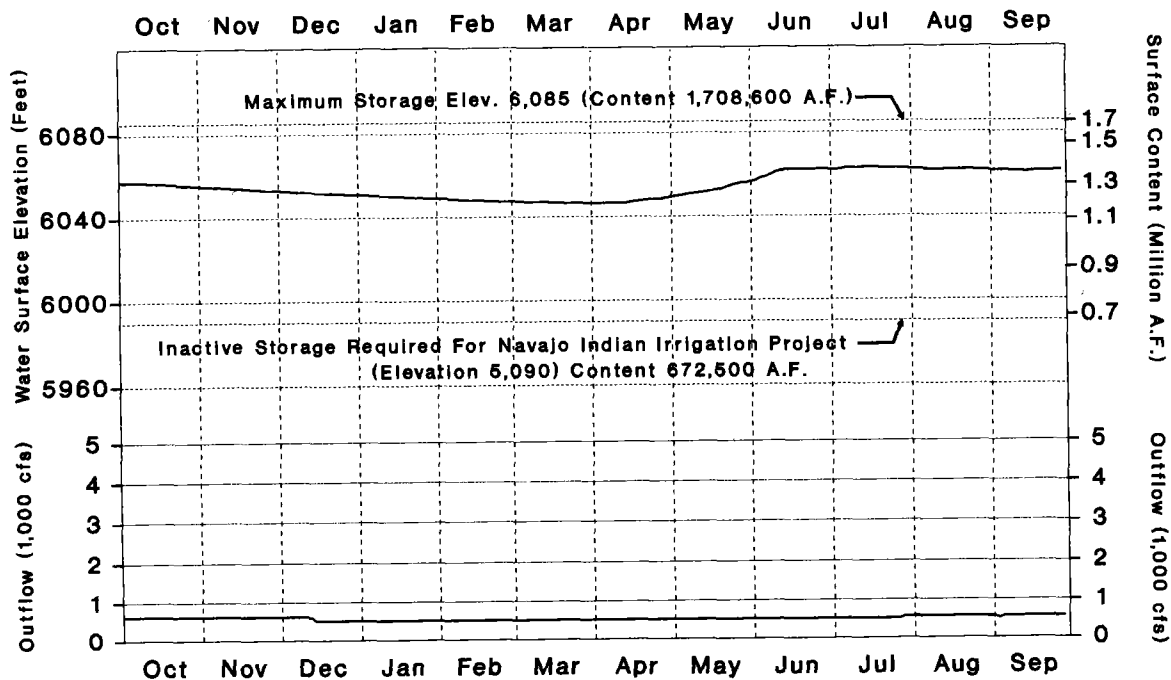


NAVAJO

Live Storage Capacity - 1,696,000 acre-feet

Power Generating Capacity - 0 KW

Live Storage 9/30/89 - 1,310,000 acre-feet



Navajo Reservoir
Water Year 1989-1990

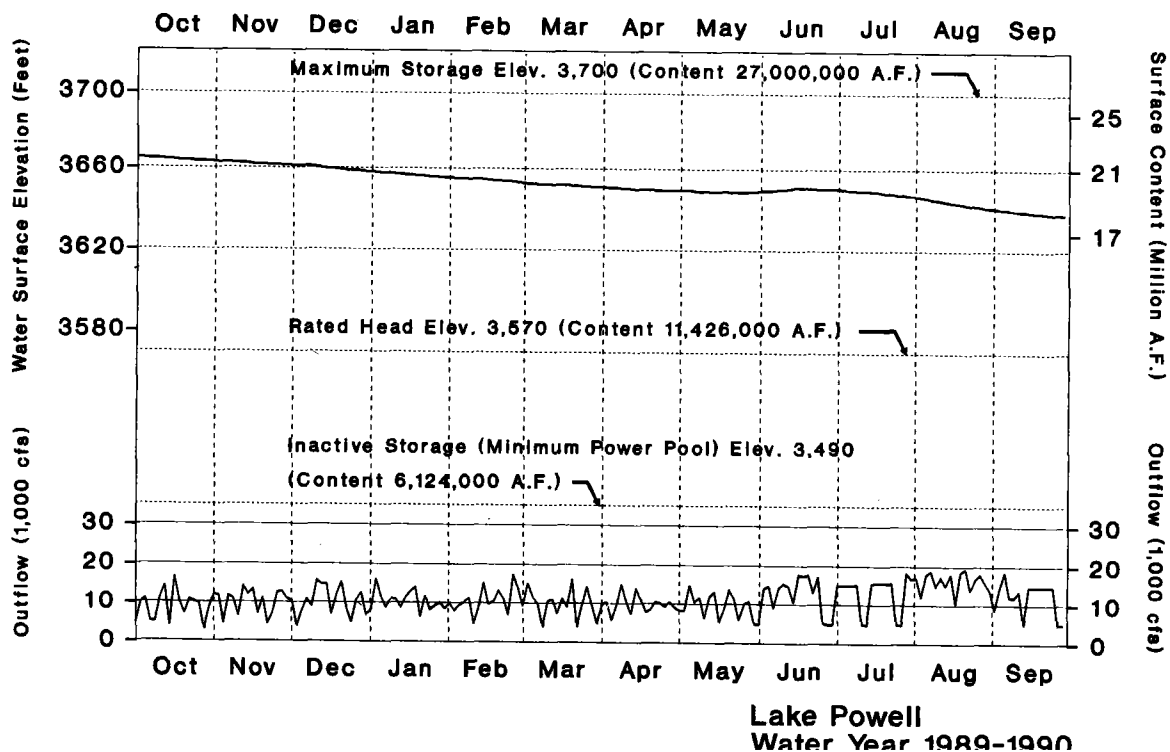


LAKE POWELL - GLEN CANYON DAM

Live Storage Capacity - 25,000,000 acre-feet

Power Generating Capacity - 1,356,000 KW

Live Storage 9/30/89 - 19,805,000 acre-feet



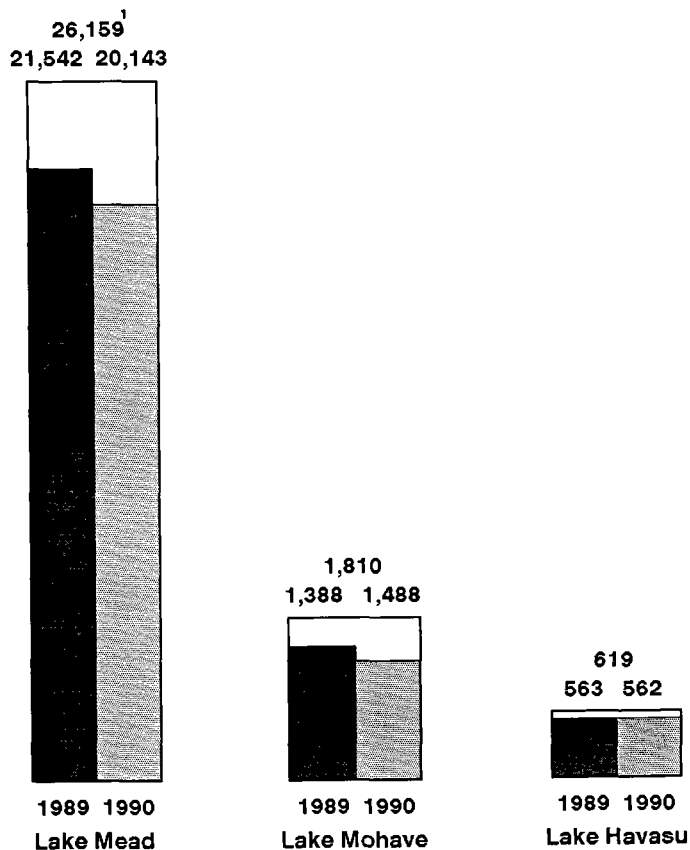
Storage in Principal Reservoirs at the End of Water Year 1990

Lower Basin

Live Storage Contents *

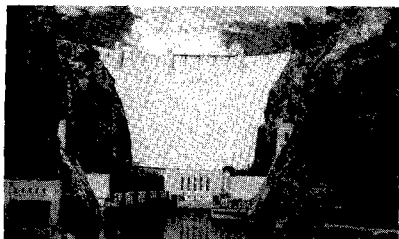
(1,000 Acre-feet)

| | Sept. 30 1989 | Percent Live Capacity | Sept. 30 1990 | Percent Live Capacity | Change in Contents |
|-------------|------------------|--------------------------|------------------|--------------------------|-----------------------|
| Lake Mead | 21,542 | 82 | 20,143 | 77 | -1,399 |
| Lake Mohave | 1,388 | 77 | 1,488 | 82 | 100 |
| Lake Havasu | 563 | 91 | 562 | 91 | -1 |
| Total | 23,493 | 82 | 22,193 | 78 | -1,300 |



* As of September 30, 1990 (excludes bank storage)

¹ Contents based on April 1967 revised capacity tables according to 1963-64 sedimentation survey at Lake Powell



LAKE MEAD - HOOVER DAM

Live Storage Capacity - 26,159,000 acre-feet

Power Generating Capacity - 1,914,000 KW

Live Storage 9/30/89 - 22,542,000 acre-feet

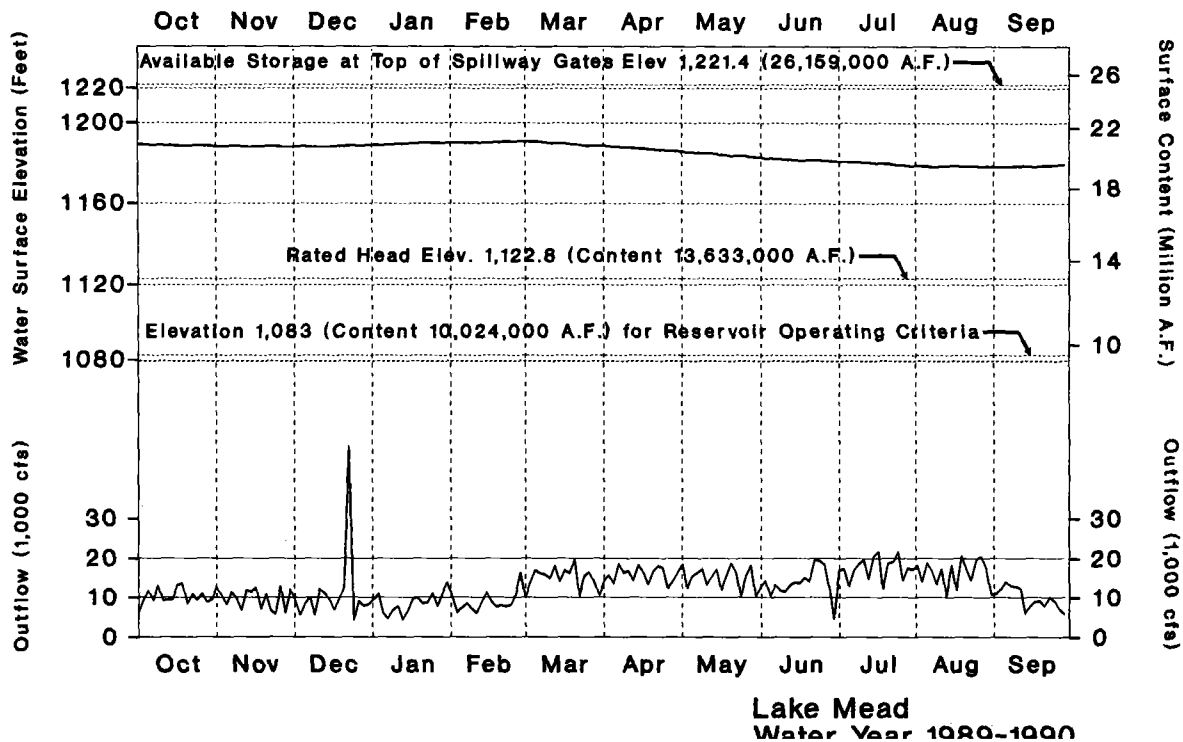


Table 3
ESTIMATED VIRGIN FLOW AT LEE FERRY
(million acre-feet)

| (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---------------------|----------------------------|-----------------------------|-----------------------|--------------------------|---|--|
| Years to 1990 | Year Ending Sept. 30 | Estimated Virgin Flow | Average to 1990 | Average Since 1896 | Progressive 10-year Moving Average | Virgin Flow Minus 95-year Average |
| 95 | 1896 | 10.1 | 14.9 | 10.1 | | -4.8 |
| 94 | 97 | 18.0 | 15.0 | 14.1 | | 3.1 |
| 93 | 98 | 13.8 | 15.0 | 14.0 | | -1.1 |
| 92 | 99 | 15.9 | 15.0 | 14.5 | | 1.0 |
| 91 | 1900 | 13.2 | 15.0 | 14.2 | | -1.7 |
| 90 | 01 | 13.6 | 15.0 | 14.1 | | -1.3 |
| 89 | 02 | 9.4 | 15.0 | 13.4 | | -5.5 |
| 88 | 03 | 14.8 | 15.1 | 13.6 | | -0.1 |
| 87 | 04 | 15.6 | 15.1 | 13.8 | | 0.7 |
| 86 | 05 | 16.0 | 15.1 | 14.0 | 14.0 | 1.1 |
| 85 | 06 | 19.1 | 15.0 | 14.5 | 14.9 | 4.2 |
| 84 | 07 | 23.4 | 15.0 | 15.2 | 15.5 | 8.5 |
| 83 | 08 | 12.9 | 14.9 | 15.1 | 15.4 | -2.0 |
| 82 | 09 | 23.3 | 14.9 | 15.7 | 16.1 | 8.4 |
| 81 | 1910 | 14.2 | 14.8 | 15.6 | 16.2 | -0.7 |
| 80 | 11 | 16.0 | 14.8 | 15.6 | 16.5 | 1.1 |
| 79 | 12 | 20.5 | 14.8 | 15.9 | 17.6 | 5.6 |
| 78 | 13 | 14.5 | 14.7 | 15.8 | 17.6 | -0.4 |
| 77 | 14 | 21.2 | 14.7 | 16.1 | 18.1 | 6.3 |
| 76 | 15 | 14.0 | 14.6 | 16.0 | 17.9 | -0.9 |
| 75 | 16 | 19.2 | 14.7 | 16.1 | 17.9 | 4.3 |
| 74 | 17 | 24.0 | 14.6 | 16.5 | 18.0 | 9.1 |
| 73 | 18 | 15.4 | 14.5 | 16.4 | 18.2 | 0.5 |
| 72 | 19 | 12.5 | 14.5 | 16.3 | 17.2 | -2.4 |
| 71 | 1920 | 22.0 | 14.5 | 16.5 | 17.9 | 7.1 |
| 70 | 21 | 23.0 | 14.4 | 16.8 | 18.6 | 8.1 |
| 69 | 22 | 18.3 | 14.2 | 16.8 | 18.4 | 3.4 |
| 68 | 23 | 18.3 | 14.2 | 16.9 | 18.8 | 3.4 |
| 67 | 24 | 14.2 | 14.1 | 16.8 | 18.1 | -0.7 |
| 66 | 25 | 13.0 | 14.1 | 16.6 | 18.0 | -1.9 |
| 65 | 26 | 15.9 | 14.1 | 16.6 | 17.7 | 1.0 |
| 64 | 27 | 18.6 | 14.1 | 16.7 | 17.1 | 3.7 |
| 63 | 28 | 17.3 | 14.0 | 16.7 | 17.3 | 2.4 |
| 62 | 29 | 21.4 | 14.0 | 16.8 | 18.2 | 6.5 |
| 61 | 1930 | 14.9 | 13.9 | 16.8 | 17.5 | 0.0 |
| 60 | 31 | 7.8 | 13.9 | 16.5 | 16.0 | -7.1 |
| 59 | 32 | 17.2 | 14.0 | 16.6 | 15.9 | 2.3 |
| 58 | 33 | 11.4 | 13.9 | 16.4 | 15.2 | -3.5 |
| 57 | 34 | 5.6 | 13.9 | 16.1 | 14.3 | -9.3 |
| 56 | 35 | 11.6 | 14.1 | 16.0 | 14.2 | -3.3 |
| 55 | 36 | 13.8 | 14.1 | 16.0 | 14.0 | -1.1 |
| 54 | 37 | 13.7 | 14.1 | 15.9 | 13.5 | -1.2 |
| 53 | 38 | 17.5 | 14.2 | 16.0 | 13.5 | 2.6 |
| 52 | 39 | 11.1 | 14.1 | 15.8 | 12.5 | -3.8 |
| 51 | 1940 | 8.6 | 14.1 | 15.7 | 11.8 | -6.3 |
| 50 | 41 | 18.1 | 14.3 | 15.7 | 12.9 | 3.2 |
| 49 | 42 | 19.1 | 14.2 | 15.8 | 13.1 | 4.2 |
| 48 | 43 | 13.1 | 14.1 | 15.8 | 13.2 | -1.8 |
| 47 | 44 | 15.2 | 14.1 | 15.7 | 14.2 | 0.3 |
| 46 | 45 | 13.4 | 14.1 | 15.7 | 14.4 | -1.5 |

Table 3
ESTIMATED VIRGIN FLOW AT LEE FERRY
(million acre-feet)

| (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---------------------|----------------------------|-----------------------------|-----------------------|--------------------------|---|--|
| Years to 1990 | Year Ending Sept. 30 | Estimated Virgin Flow | Average to 1990 | Average Since 1896 | Progressive 10-year Moving Average | Virgin Flow Minus 95-year Average |
| 45 | 46 | 10.4 | 14.1 | 15.6 | 14.0 | -4.5 |
| 44 | 47 | 15.5 | 14.2 | 15.6 | 14.2 | 0.6 |
| 43 | 48 | 15.6 | 14.1 | 15.6 | 14.0 | 0.7 |
| 42 | 49 | 16.4 | 14.1 | 15.6 | 14.5 | 1.5 |
| 41 | 1950 | 12.9 | 14.1 | 15.6 | 15.0 | -2.0 |
| 40 | 51 | 11.6 | 14.1 | 15.5 | 14.3 | -3.3 |
| 39 | 52 | 20.7 | 14.1 | 15.6 | 14.5 | 5.8 |
| 38 | 53 | 10.6 | 14.0 | 15.5 | 14.2 | -4.3 |
| 37 | 54 | 7.7 | 14.1 | 15.4 | 13.5 | -7.2 |
| 36 | 55 | 9.2 | 14.2 | 15.3 | 13.1 | -5.7 |
| 35 | 56 | 10.7 | 14.4 | 15.2 | 13.1 | -4.2 |
| 34 | 57 | 20.1 | 14.5 | 15.3 | 13.6 | 5.2 |
| 33 | 58 | 16.5 | 14.3 | 15.3 | 13.6 | 1.6 |
| 32 | 59 | 8.6 | 14.3 | 15.2 | 12.9 | -6.3 |
| 31 | 1960 | 11.3 | 14.4 | 15.1 | 12.7 | -3.6 |
| 30 | 61 | 8.5 | 14.5 | 15.0 | 12.4 | -6.4 |
| 29 | 62 | 17.3 | 14.8 | 15.0 | 12.1 | 2.4 |
| 28 | 63 | 8.4 | 14.7 | 15.0 | 11.8 | -6.5 |
| 27 | 64 | 10.2 | 14.9 | 14.9 | 12.1 | -4.7 |
| 26 | 65 | 18.9 | 15.1 | 14.9 | 13.1 | 4.0 |
| 25 | 66 | 11.2 | 14.9 | 14.9 | 13.1 | -3.7 |
| 24 | 67 | 11.9 | 15.1 | 14.8 | 12.3 | -3.0 |
| 23 | 68 | 13.7 | 15.2 | 14.8 | 12.0 | -1.2 |
| 22 | 69 | 14.4 | 15.3 | 14.8 | 12.6 | -0.5 |
| 21 | 1970 | 15.4 | 15.3 | 14.8 | 13.0 | 0.5 |
| 20 | 71 | 15.1 | 15.3 | 14.8 | 13.7 | 0.2 |
| 19 | 72 | 12.2 | 15.3 | 14.8 | 13.1 | -2.7 |
| 18 | 73 | 19.4 | 15.5 | 14.9 | 14.2 | 4.5 |
| 17 | 74 | 13.3 | 15.3 | 14.8 | 14.6 | -1.6 |
| 16 | 75 | 16.6 | 15.4 | 14.9 | 14.3 | 1.7 |
| 15 | 76 | 11.6 | 15.3 | 14.8 | 14.4 | -3.3 |
| 14 | 77 | 5.8 | 15.6 | 14.7 | 13.8 | -9.1 |
| 13 | 78 | 15.2 | 16.3 | 14.7 | 13.9 | 0.3 |
| 12 | 79 | 17.9 | 16.4 | 14.8 | 14.3 | 3.0 |
| 11 | 1980 | 17.5 | 16.3 | 14.8 | 14.5 | 2.6 |
| 10 | 81 | 8.2 | 16.2 | 14.7 | 13.8 | -6.7 |
| 9 | 82 | 16.2 | 17.1 | 14.7 | 14.2 | 1.3 |
| 8 | 83 | 24.0 | 17.2 | 14.8 | 14.6 | 9.1 |
| 7 | 84 | 24.5 | 16.2 | 14.9 | 15.8 | 9.6 |
| 6 | 85 | 20.8 | 14.8 | 15.0 | 16.2 | 5.9 |
| 5 | 86 | 21.9 | 13.6 | 15.1 | 17.2 | 7.0 |
| 4 | 87 | 16.9 | 11.6 | 15.1 | 18.3 | 2.0 |
| 3 | 88 | 11.6 | 9.8 | 15.1 | 18.0 | -3.3 |
| 2 | 89 | 9.2 | 8.9 | 15.0 | 17.1 | -5.7 |
| 1 | 1990 | 8.5 | 8.5 | 14.9 | 16.2 | -6.4 |
| Maximum | | 24.5 | | | 18.8 | 9.6 |
| Minimum | | 5.6 | | | 11.8 | -9.3 |
| Average | | 14.9 | | | 15.0 | 0.0 |

Table 4
HISTORIC FLOW AT LEE FERRY
1953-1990

| Unit: 1,000 a.f. | | |
|----------------------------------|--------------------|---------------------------------|
| 1 | 2 | 3 |
| Water Year Ending Sept. 30 | Historic Flow | Progressive 10-Year Total |
| 1953 | 8,805 | |
| 1954 | 6,116 | |
| 1955 | 7,307 | |
| 1956 | 8,750 | |
| 1957 | 17,340 | |
| 1958 | 14,260 | |
| 1959 | 6,756 | |
| 1960 | 9,192 | |
| 1961 | 6,674 | |
| 1962 ¹ | 14,790 | 99,990 |
| 1963 ² | 2,520 | 93,705 |
| 1964 ³ | 2,427 | 90,016 |
| 1965 | 10,835 | 93,544 |
| 1966 | 7,870 | 92,664 |
| 1967 | 7,824 | 83,148 |
| 1968 | 8,358 | 77,246 |
| 1969 | 8,850 | 79,340 |
| 1970 | 8,688 | 78,836 |
| 1971 | 8,607 | 80,769 |
| 1972 | 9,330 | 75,309 |
| 1973 | 10,141 | 82,930 |
| 1974 | 8,277 | 88,780 |
| 1975 | 9,274 | 87,219 |
| 1976 | 8,494 | 87,843 |
| 1977 | 8,269 | 88,288 |
| 1978 | 8,369 | 88,299 |
| 1979 | 8,333 | 87,782 |
| 1980 | 10,950 | 90,044 |
| 1981 | 8,316 | 89,753 |
| 1982 | 8,323 | 88,746 |
| 1983 | 17,520 | 96,125 |
| 1984 | 20,518 | 108,366 |
| 1985 | 19,109 | 118,201 |
| 1986 | 16,866 | 126,573 |
| 1987 | 13,450 | 131,754 |
| 1988 | 8,231 | 131,616 |
| 1989 | 7,995 ⁴ | 131,278 |
| 1990 | 7,952 ⁴ | 128,280 |

¹ Storage in Flaming Gorge and Navajo Reservoirs began in 1962.

² Storage in Glen Canyon Reservoir began in 1963.

³ Storage in Fontenelle reservoir began in 1964.

⁴ Based upon provisional streamflow records subject to revision.

The charts on pages 26 and 27 illustrate some of the pertinent historical facts related to the amounts of water produced by the *Colorado River System above Lee Ferry, Arizona*, the compact division point between the Upper and Lower Colorado River Basins. The first chart, on page 26, is entitled *Colorado River Flow at Lee Ferry, Arizona*. The top of each vertical bar represents the estimated virgin flow of the river, i.e., the flow of the river in millions of acre-feet past Lee Ferry for a given year had it not been depleted by activities of man. Each vertical bar has two components: The lower shaded part represents the estimated or measured historic flow at Lee Ferry, and the difference between the two sections of the bar in any given year represents the stream depletion, or the amount of water estimated to have been removed by man from the virgin supply upstream from Lee Ferry. It is worth noting that in 1977 and again in 1981 the historic flow at Lee Ferry exceeded the virgin flow. Beginning in 1962, part of this depletion at Lee Ferry was caused by the retention and storage of water in storage units of the Colorado River Storage Project. The horizontal line (at approximately 15 million acre-feet) shows the long-term average virgin flow from 1896 through 1990. Because the Colorado River Compact is administered on the basis of running averages covering periods of ten years, the progressive ten-year average historic and virgin flows are displayed on this chart.

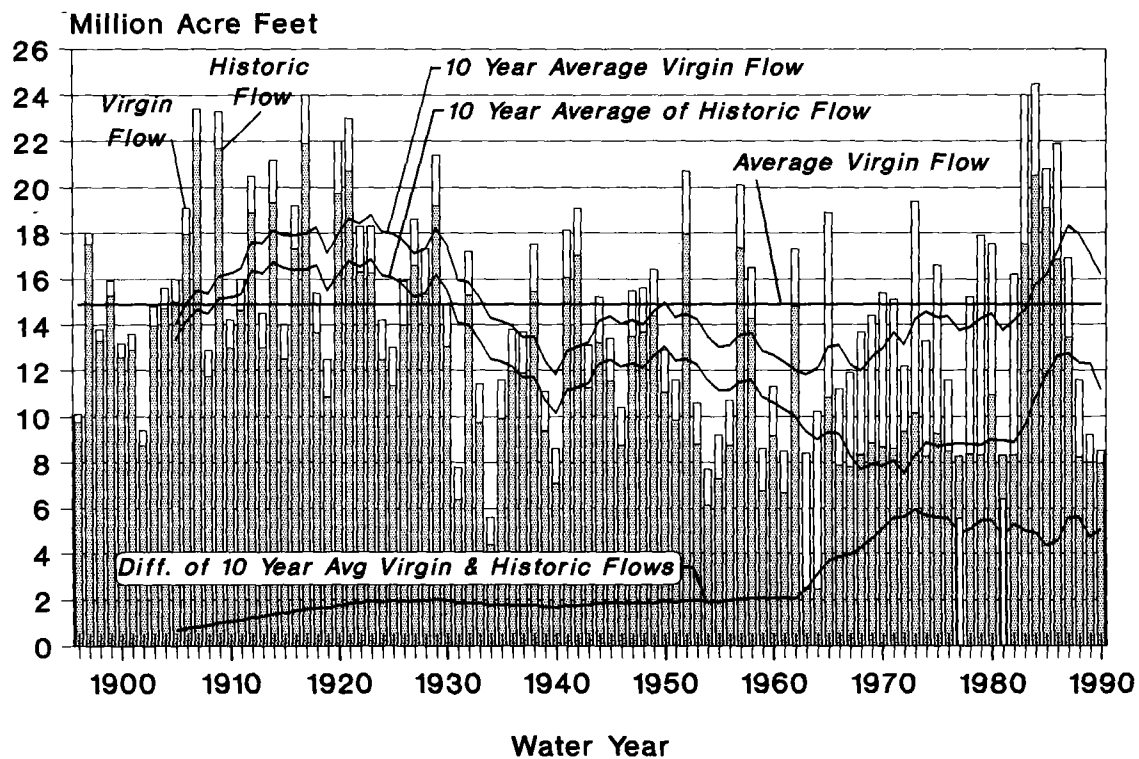
The second chart on page 27, entitled *Lee Ferry Average Annual Flow for Selected Periods*, is a graphical representation of historic and virgin flow averages for several periods of record. The periods of water years selected were those to which reference is usually made for various purposes in documents pertaining to the Colorado River System.

Several important hydrologic facts are apparent from these two charts on pages 26 and 27.

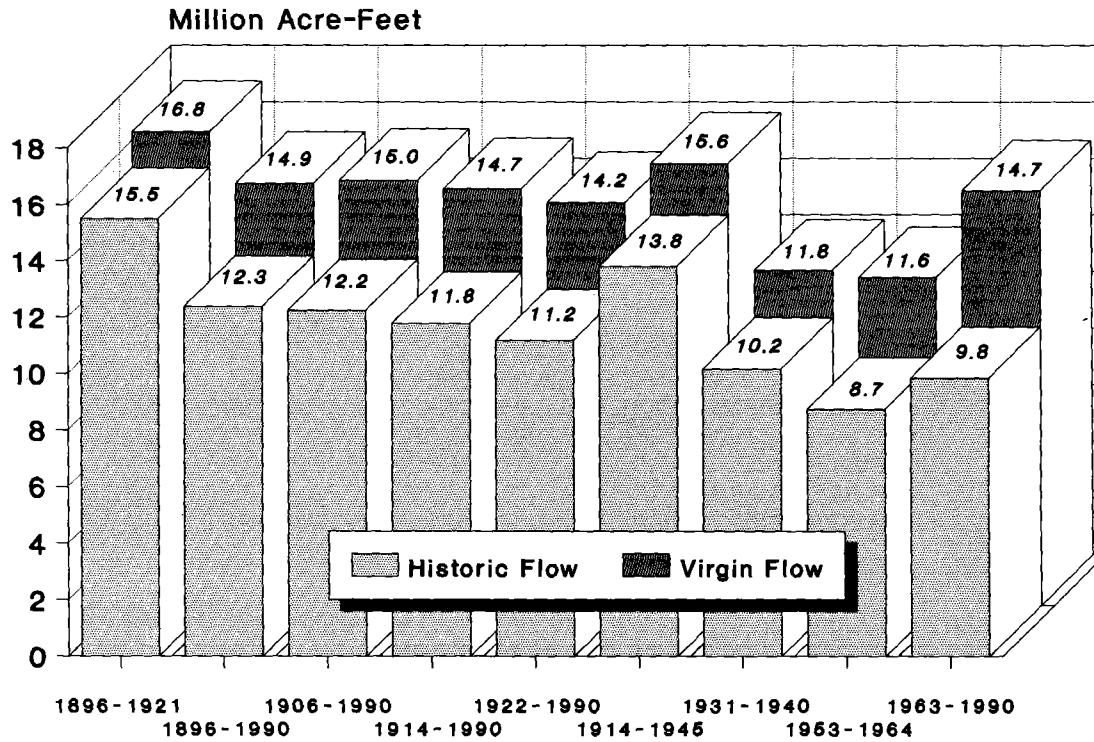
- (1) A vast majority of the high flows occurred prior to 1929.
- (2) Since the 1924-1933 decade, the progressive ten-year average virgin flow has not exceeded the average virgin flow except in the 1941-1950 and the exceptionally wet 1975-1984 through 1981-1990 decades.
- (3) For the period 1896-1921, which is prior to the Colorado River Compact of 1922, the average virgin flow was estimated to be 16.8 million acre-feet per year, which is considerably greater than for any other period selected, including the long-term average. A stream-gaging station at Lees Ferry, Arizona was not installed until 1921.

Colorado River Flow

At Lee Ferry, Arizona



Lee Ferry Average Annual Flow For Selected Periods



Thus, the virgin flow at Lees Ferry prior to the 1922 Compact is estimated based upon records obtained at other stations, e.g. the stream gage on the Colorado River at Yuma, Arizona for the period 1902-1921.

- (4) For the longest period shown, 1896-1990, the estimated average annual virgin flow is 14.9 million acre-feet and the average annual historic flow is 12.3 million acre-feet.
- (5) For the next longest period, 1906-1990, the estimated average annual virgin flow is 15.0 million acre-feet and the average annual historic flow is 12.2 million acre-feet. Many of the early records for this series of years, as well as for the 1896-1990 period, are based upon the estimates of flows made at other gaging stations, as mentioned in (3) above. This average is about equal to the 15.0 million acre-feet estimated for the 1906-1967 period which was used as the basis for justification of a water supply for the Central Arizona Project authorized in 1968.
- (6) The estimated average annual virgin flow during the 1914-1990 period is 14.7 million acre-feet. This period is an extension of the 1914-1965 period used in the Upper Colorado Region Comprehensive Framework Studies of 1971. The average annual virgin flow for the 1914-1965 time period is 14.6 million acrefeet.
- (7) The average annual virgin flow for the period 1914-1945 is 15.6 million acre-feet. This was the period of record used by the negotiators of the Upper Colorado River Basin Compact of 1948.
- (8) For the period 1922-1990, which is the period of record since the signing of the Colorado River Compact, the average annual virgin flow is 14.2 million acre-feet and the average annual historic flow is 11.2 million acre-feet. Records for this series of years are based upon actual measurements of flows at Lees Ferry. The ten-year moving average flow since 1922 is considerably less than the ten-year moving average flow prior to 1922.
- (9) Two completely unrelated ten-year periods of minimum flows have occurred since 1930. During these periods, 1931-1940 and 1954-1963, the average annual virgin flow amounts to only 11.8 million acre-feet.
- (10) For a 12-year period, 1953-1964, the average annual virgin flow amounts to only 11.6 million acre-feet.

- (11) Since Glen Canyon Dam was closed in 1963, the estimated virgin flow for the subsequent 27 years is 14.7 million acre-feet. The estimated historical flow for the same period (1963-1990) is 9.8 million acre-feet.

B. LEGAL

1. WATER NEWSLETTER

The legal staff continues to inform the Commissioners, their advisers, and other interested parties about developments in the courts, Congress, and certain Federal agencies through the Water Newsletter. Current information can be found in the newsletter. In addition, the legal staff has prepared legal memoranda on matters needing more detailed treatment.

2. COURT CASES

Action has been taken in a number of cases of importance to the Upper Colorado River Basin States. These cases include:

Oklahoma v. Environmental Protection Agency, 10th Cir., 908 F.2d 595. In these consolidated appeals, appellants challenged certain actions of respondent Environmental Protection Agency (EPA) in issuing a Clean Water Act (CWA) discharge permit to the City of Fayetteville, Arkansas (the City) pursuant to the National Pollutant Discharge Elimination System for a new municipal wastewater treatment plant. The City proposed to discharge treated wastewater into both the White River in Arkansas and into Mud Creek, a tributary of the Illinois River, an Arkansas-Oklahoma interstate stream. Based on its review of the language of the CWA and EPA's implementing regulations, the legislative history of the CWA, and cases interpreting the CWA, the Tenth Circuit held that "no discharge to a navigable water, such as the Illinois River, may be permitted unless compliance with all applicable water quality requirements, including the federally approved standards of affected downstream states, is assured." The Court also held that EPA's decision to issue the City's permit was arbitrary and capricious, finding that EPA's decision was flawed by misinterpretation and misapplication of Oklahoma's water quality standards (WQS) and arbitrary disregard for expert testimony regarding the violations of the WQS that were already occurring and the existing degraded condition of the Illinois River. The Court therefore reversed EPA's decision authorizing the City to discharge a portion of its effluent into the Illinois River, holding that "where water quality standards violations are already occurring in the receiving waters, no additional point source discharge to

those waters may be permitted if it would contribute to the conditions that produced the violations.”

California v. Federal Energy Regulatory Commission, 495 U.S. ___, 109 L.Ed.2d 474, 110 S.Ct. ___. Pursuant to the Federal Power Act (FPA), the Federal Energy Regulatory Commission (FERC) issued a license authorizing operation of the Rock Creek hydroelectric project in California. FERC also set minimum flow rates for the project. The licensee also applied for State water permits. When the State Water Resources Control Board (WRCB) considered a draft order requiring much higher minimum flow rates, the licensee petitioned FERC for a declaration that FERC possessed exclusive jurisdiction to determine the project’s minimum flow requirements. FERC issued an order directing the licensee to comply with the Federal permit requirements, reasoning that setting minimum flows was integral to FERC’s planning and licensing process under section 10(a) of the FPA. Four days after FERC’s order, the WRCB issued an order directing the licensee to comply with the higher State-mandated minimum flows. WRCB also asked FERC for a rehearing of its order. FERC denied the request for a rehearing, and the Ninth Circuit affirmed, holding that FPA section 27, as construed in *First Iowa Hydro-Electric Cooperative v. FPC*, 328 U.S. 152 (1946), did not preserve California’s right to regulate minimum flow rates and that the FPA preempted WRCB’s minimum flow rate requirements. The Supreme Court affirmed the decision of the Ninth Circuit, holding that if the meaning of section 27 and the preemptive effect of the FPA were matters of first impression, California’s argument that the stream flow requirements relate to a use encompassed by section 27—the generation of power or protection of fish—could be said to present a close question. However, the Court found that *First Iowa* previously construed section 27 and held that the section is “limited to laws as to the control, appropriation, use or distribution of water in irrigation or for municipal or other uses of the same nature” and has primary, if not exclusive, reference to such proprietary rights. The Supreme Court “decline[d] at this late date to revisit and disturb the understanding of §27 as set forth in *First Iowa*.” The Court also found that Congress has amended the FPA to elaborate and reaffirm *First Iowa*’s holding that the FPA establishes a broad and paramount Federal regulatory role. Finally, the Court held that allowing California to impose the challenged minimum flow requirements would be contrary to congressional intent regarding FERC’s licensing authority and would, as the Ninth Circuit found, “constitute a veto of the project that was approved and licensed by FERC.”

State of Texas v. State of New Mexico, 494 U.S. ___, 108 L.Ed.2d 98, 110 S.Ct. ___. Based on the recommendation of the Special Master, the Supreme Court granted the joint motion for entry of stipulated judgment. The stipulated judgment required New Mexico to pay Texas \$14 million on or before March 1, 1990; the money will be disbursed by Texas in accordance with Exhibit B of the joint motion. The stipulated judgment also requires Texas to release New Mexico from all claims for equitable or legal relief, other than the relief embodied in the Court's March 28, 1988 Amended Decree and actions thereunder, arising out of New Mexico's breaches of the Pecos River Compact for the years 1952 through 1986. Exhibit B specifies how Texas is to use the \$14 million: \$13,800,000 will be deposited in Texas Water Assistance Fund No. 480 of the Texas Water Development Board to be used for agricultural and irrigation projects and any necessary associated studies in the Texas counties of Loving, Ward, Reeves, and Pecos; the Texas Attorney General may treat the other \$200,000 as attorneys' fees or investigative costs, provided that Texas and New Mexico agree that any use of the settlement funds in this manner will not be construed as an admission that New Mexico has any liability for the attorneys' fees and costs Texas incurred in this litigation.

3. LEGISLATION

In the Second Session of the 101st Congress (without regard to the water year), Congress enacted the following statutes that are important to the Upper Colorado River Basin States:

Public Law 101-514, approved November 5, 1990, Energy and Water Development Appropriations Act, 1991.

Public Law 101-512, approved November 5, 1990, Department of the Interior and Related Agencies Appropriations Act, 1991.

Public Law 101-506, approved November 5, 1990, Rural Development, Agriculture, and Related Agencies Appropriations Act, 1991.

C. EDUCATION — INFORMATION

1. GENERAL COOPERATION

The Upper Colorado River Commission has directed its Education and Information program toward promoting interstate cooperation, harmony, and united efforts; developing an understanding in other sections of the United States of the problems of the Upper Colorado River Basin; and the creation of a favorable attitude on the part of Congress with respect to the development of the industrial and agricultural resources of the Upper Colorado River Basin.

The Commission has continued to cooperate with members of the Congressional delegations from the Upper Colorado River Basin States and with officials of the Department of the Interior and the Bureau of Reclamation in seeking appropriations of funds by the Congress for the construction of the Storage Units and participating projects authorized for construction, as well as funds for the investigations of additional participating projects that are given priority in planning in the Colorado River Storage Project Act. As part of this cooperation, the Commission's Executive Director has been in Washington, D. C. at intermittent periods, acting as liaison between the Congress and the States and various departments of government, supplying information, arranging and taking part in Congressional hearings, and providing other assistance requested.

2. LIBRARY

Efforts are being continued to accumulate all types of engineering, legal, economics, and semi-technical documents related to the Colorado River Basin to comprise a well-equipped and efficiently-operating permanent library. As materials are collected for inclusion in the library, they are cataloged in the Commission's computer system. Also, many thousands of pages of documents have been placed on microfiche. Information in the Commission's library will be available to any of its member States on short notice should a need arise. Studies are being made, supplemented, or collected to address the many problems associated with the development, utilization, and conservation of water and hydroelectric resources of the Colorado River Basin.

The continuing program of library expansion has been maintained. Emphasis is placed on the acquisition of information which illumines that growing body of law known as the "law of the river." Since the Environmental Protection Agency and the Western Area Power Administration

have assumed an increasing importance in the water development field, documents from those agencies are being monitored and acquired as a part of the Commission's library.

3. RELIEF MODEL

The Relief Model of the Upper Colorado River Basin and the adjacent areas is available for display at conventions and other public events.

COLORADO RIVER STORAGE PROJECT AND PARTICIPATING PROJECTS

A. AUTHORIZED STORAGE UNITS

(Information relative to Storage Units and participating projects have been obtained from reports on investigations and activities of the United States Department of the Interior, Bureau of Reclamation.)

The Colorado River Storage Project was authorized for construction by the United States Congress in the Act of April 11, 1956 (70 Stat. 105). Four storage units were authorized by this Act: Glen Canyon Dam and Reservoir (Lake Powell) on the Colorado River in Arizona and Utah, Navajo Dam and Reservoir on the San Juan River in New Mexico and Colorado, Flaming Gorge Dam and Reservoir on the Green River in Utah and Wyoming, and the Wayne N. Aspinall Storage Unit (Aspinall Unit), formerly named the Curecanti Storage Unit and rededicated in July 1981, on the Gunnison River in Colorado. The Aspinall Unit consists of three dams and reservoirs: Blue Mesa, Morrow Point, and Crystal. Combined, the four storage units provide about 33,583,000 acre-feet of water storage capacity.

The Act authorized the construction of eleven participating projects. Ten additional participating projects have been authorized by subsequent congressional legislation.

The storage units and participating projects are described in the twenty-seventh and earlier annual reports of the Upper Colorado River Commission. Progress in construction, planning, operation and investigation of the storage units and participating projects accomplished during the past water year are briefly outlined as follows:

1. GLEN CANYON STORAGE UNIT

Glen Canyon Dam and Reservoir (Lake Powell) comprises the key storage unit of the Colorado River Storage Project (CRSP) and is the largest of the initial four, providing about 80 percent of the storage and generating capacity. Glen Canyon Dam was completed in 1964.

a. Glen Canyon Dam Environmental Impact Statement and Glen Canyon Environmental Studies

In 1982 the Department of the Interior (DOI) initiated the Glen Canyon Environmental Studies (GCES) to quantify and qualify the en-

vironmental and recreational impacts of the operations of Glen Canyon Dam. The initial phase of the technical work was completed in 1988. Upon review by DOI, it was determined that additional data was required on the impacts of low and fluctuating flows before any conclusions could be made. A second phase of the GCES was directed to begin in November of 1988.

Subsequent public and congressional comment and concern led to a review of the matter by the Secretary of the Interior. Upon review, the Secretary determined that the Glen Canyon Dam Environmental Impact Statement (GCD EIS) should be prepared. The Bureau of Reclamation (Reclamation) was directed on July 27, 1989 to undertake that process. Reclamation was designated the lead agency, with other agencies to become cooperating agencies as required for their expertise. From an original list of four operating agencies, the list has now grown to ten including: Reclamation (lead agency), Bureau of Indian Affairs, National Park Service, U.S. Fish and Wildlife Service (Interior Department); Western Area Power Administration (Department of Energy); Arizona Game and Fish Department (State of Arizona); Havasupai Indian Tribe, Hopi Indian Tribe, Hualapai Indian Tribe, Navajo Nation (Indian Tribes).

The primary objective of the GCD EIS, as stated in the GCD EIS Management Plan, is to evaluate the impacts of current and alternative dam operations on the downstream environment and ecological resources of the Glen Canyon National Recreation Area and Grand Canyon National Park. The alternative dam operations to be examined will range from those that emphasize the potential to conserve and maintain the downstream resources to those that emphasize peaking power production.

The EIS will identify and quantify, to the fullest extent possible, the benefits, values and application of the dam and the resources affected by the dam, including, but not limited to, water supply, water quality, recreation, cultural resources, hydroelectric power generation, and fish and wildlife (including threatened and endangered species), in light of the statutory responsibilities of the Secretary of the Interior.

The focus of the EIS is to evaluate alternative operations of the dam. In addition, other mitigation measures may be identified to minimize impacts to resources of concern. Alternative dam operations and potential structural and institutional mitigation measures will be considered to formulate the range of reasonable alternatives.

Alternative dam operations may result in off-site cumulative impacts. Given the best available information, the magnitude of these impacts will be identified so that the Secretary is informed of the consequences and options available to address these issues.

The EIS scoping process was conducted from March 12, 1990 to May 4, 1990. During that period over 18,000 individual written responses were received. Eight public meetings were held in Salt Lake City, Utah; Denver, Colorado; Phoenix, Arizona; Flagstaff, Arizona (two meetings); Los Angeles, California; San Francisco, California; and Washington D.C. Comments were consolidated and analyzed in a scoping report published in December of 1990.

Work on the formulation of alternatives began following the scoping effort. As 1990 ended, the alternatives were nearly ready for public review. A written comment period on the alternatives has been established and meetings are scheduled to take place in late winter of 1991.

Starting in June of 1990 and continuing through July of 1991, a variety of research flows from Glen Canyon Dam are taking place. The objective of the research flows is to allow the GCES scientists to study specific flow releases, and their effects on the resources of Glen and Grand Canyons. The research releases are built around 17 different flow scenarios. The releases represent different fluctuating flow regimes, steady flow regimes, seasonal flow regimes and normal operations. Research evaluation flows are scheduled prior to and after each research flow scenario in order to evaluate the short-term effects of the flows. The flows are coordinated among the GCES researchers, Western Area Power Administration and Reclamation.

Reports on the research flows will be completed by March of 1992.

b. Recreational Use

The extensive recreational use of Glen Canyon National Recreation Area, which surrounds Lake Powell, is demonstrated by the fact that during 1989 (latest available figures) approximately 3,483,904 people visited the area. The National Park Service has concession-operated facilities at Wahweap, Dangling Rope, Halls Crossing, Hite and Bullfrog Basin on the reservoir and Lees Ferry, 16 miles below the dam on the Colorado River. The San Juan Marina, which was operated on Lake Powell by the Navajo Nation, is now closed due to a flood in 1989.

From 1909 through 1961, an estimated total of 20,972 people visited Rainbow Bridge. When access to the bridge by water was made available through completion of the dam in 1963, visitation rapidly increased. In 1966, 20,468 people visited Rainbow Bridge, almost as many people as had visited the site during the previous 53 years. During 1989 there were 255,420 visitors at Rainbow Bridge.

2. FLAMING GORGE STORAGE UNIT

Flaming Gorge Dam and Powerplant were completed in 1963. A contract was awarded to uprate the Flaming Gorge Dam generators. Upgrading of the units began in the fall of 1990 with completion scheduled for the summer of 1992. This uprate will increase the plant nameplate capacity from 108 megawatts (MW) to about 151 MW. Plans have been developed for the visitor center and dam tour areas to be retrofitted to make the facilities fully accessible to persons with disabilities.

Flaming Gorge National Recreation Area, which surrounds the Flaming Gorge Dam and Reservoir, recorded 1,700,870 visitors during 1989 (latest available figures). The site is administered by the Ashley National Forest. Fishing is an important recreational activity on both the reservoir and in the Green River below the dam.

3. NAVAJO STORAGE UNIT

The major purposes of Navajo Dam and Reservoir are to regulate the flows of the San Juan River and to provide a water supply for the authorized Navajo Indian Irrigation Project near Farmington, the San Juan-Chama Participating Project in the Rio Grande Basin and the Hammond Participating Project, all in New Mexico. Part of the water is also used for municipal and industrial purposes in northwestern New Mexico. Navajo Dam was completed in 1963.

4. WAYNE N. ASPINALL STORAGE UNIT

The Wayne N. Aspinall Storage Unit includes three major dams and power plants in the canyon of the Gunnison River downstream from Gunnison, Colorado and upstream from the Black Canyon of the Gunnison National Monument. The three dams are Blue Mesa, Morrow Point, and Crystal.

Upgrading of Morrow Point Dam generator number one was completed during the water year. Testing of the uprated generator revealed that the maximum capacity was only 55 MW instead of the expected 78 MW. The contract was terminated for non-performance. Reclamation is now



Navaio Dam and Reservoir located about 39 miles east of Farmington, New Mexico

proceeding with a solicitation for a new contract to redo the generator and to uprate the second generator.

The National Park Service administers recreational facilities. In 1989 there were 1,125,447 visitors (latest available figures).

5. STORAGE UNITS FISHERY INFORMATION

The Flaming Gorge, Wayne N. Aspinall, Glen Canyon, and Navajo Units continue to provide excellent warm-and cold-water fishing, both in the reservoirs and in tailwater streams below the dams. Use on the reservoirs currently totals over a million angler days each year. Lake Powell provides over half of the total use, with the remainder coming equally from the other reservoirs.

Lake Powell is almost exclusively a warm-water fishery with striped bass, crappie, walleye, channel catfish, and largemouth bass as the harvested species.

Navajo and Flaming Gorge provide both warm-water and cold-water fishing, with trout and kokanee the predominant cold-water harvest and catfish, bass, and crappie (at Navajo) the preferred warm-water fishes. The Aspinall reservoirs are exclusively cold-water fisheries, with kokanee and rainbow trout the predominant catch.

The four tailwaters have provided "blue ribbon" trout fishing that many view as some of the best in the western United States. Combined, the annual use of these tailwaters exceeds 200,000 angler days annually. The San Juan River below Navajo Dam receives about half of the total use with the Colorado River (below Glen Canyon), the Green River (below Flaming Gorge), and the Gunnison River (below Crystal) providing the remainder.

Restrictions on fishing gear and the allowable harvest have been required on these rivers to insure quality use as fishing pressure increases annually. Estimates of the value of a day's fishing on these quality streams range from \$20 to \$100 per day, based on travel cost studies. Using those estimates, the value of these tailwater fisheries could approach \$20 million annually. Even more importantly, these values tend to increase each year as trout fishing opportunities become better known.

B. TRANSMISSION DIVISION

The power system includes high voltage transmission lines that interconnect the CRSP hydro-powerplants and deliver power to major load centers or to other delivery points. The system is interconnected with adjacent Federal, public, and private utility transmission systems. The Transmission Division was transferred to the Western Area Power Administration, Department of Energy, in Fiscal Year 1978.

During 1990 new contracts were signed to deliver CRSP power to the Silt Project, the Navajo Indian Irrigation Project, and the Jensen Unit of the Central Utah Project. The contracts included Reclamation's new rate, where appropriate, for irrigation pumping service on CRSP participating projects.

Generation at CRSP powerplants amounted to 4.5 billion kilowatt hours during water year 1990. The major portion, 3.79 billion kilowatt hours, was produced at Glen Canyon Dam. The balance was produced at Flaming Gorge, Blue Mesa, Morrow Point, Crystal, and Fontenelle Dams.

The following table lists the gross generation for Fiscal Years 1989 and 1990 and the percentage of change.

| GROSS GENERATION KWH | | | |
|----------------------|-------------------|-------------------|--------------|
| Powerplant | FY 1989 | FY 1990 | % Change |
| Gken Canyon | 3,966,143,000 | 3,793,819,000 | - 4.3 |
| Flaming Gorge | 252,221,000 | 260,302,000 | + 3.1 |
| Blue Mesa | 155,528,000 | 149,329,000 | - 4.0 |
| Morrow Point | 202,357,000 | 197,203,000 | - 2.5 |
| Crystal | 96,244,000 | 91,181,000 | - 5.3 |
| Fontenelle | <u>23,618,000</u> | <u>58,753,000</u> | <u>+59.8</u> |
| TOTAL: | 4,696,111,000 | 4,550,587,000 | - 3.0 |

C. AUTHORIZED PARTICIPATING PROJECTS

Twenty-one participating projects have been authorized by Congress. Eleven were authorized by the initial authorizing Act of April 11, 1956 (70 Stat. 105); two were authorized by the Act of June 13, 1963 (76 Stat. 96); three were authorized by the Act of September 2, 1964 (78 Stat. 852); and five were authorized by the Act of September 30, 1968 (82 Stat. 886). Eleven are in Colorado, three in New Mexico, two in Utah, three in Wyoming, one in both Colorado and Wyoming, and one in both Colorado and New Mexico. Participating projects develop, or would develop, water in the Upper Colorado River System for irrigation, municipal and industrial (M&I) uses and other purposes, and participate in the use of revenues from the Upper Colorado River Basin Fund to help repay the costs of irrigation features that are beyond the ability of the water users to repay.

The following are completed, or nearly completed, participating projects:

| Project | State | Dam | Year Completed |
|------------------|------------|---------------------------|----------------|
| Paonia | Colorado | Paonia | 1962 |
| Smith Fork | Colorado | Crawford | 1962 |
| Florida | Colorado | Lemon | 963 |
| Silt | Colorado | Rifle Gap | 1967 |
| Bostwick Park | Colorado | Silver Jack | 971 |
| Hammond | New Mexico | — | 1962 |
| Vernal Unit, CUP | Utah | Steinaker | 1962 |
| Emery County | Utah | Joes Valley | 1966 |
| Eden | Wyoming | Big Sandy, Eden | 1960 |
| Lyman | Wyoming | Meeks Cabin, Stateline | 1981 |

The present status of construction or investigation for the remaining participating projects follows:

1. COLORADO

a. Fryingpan-Arkansas Project

Although the Fryingpan-Arkansas Project is not a participating project of the Colorado River Storage Project because it does not participate in the Upper Colorado River Basin Fund, it is sometimes referred to as a

limited participating project because it does utilize water diverted from the Upper Colorado River System to the eastern slope of Colorado.

The Eastern Colorado Projects Office, located in Loveland, Colorado directs the operation and maintenance activities of the Colorado-Big Thompson and Fryingpan-Arkansas Projects. A field office is located in Pueblo to coordinate with the Southeastern Colorado Water Conservancy District and the State Division Engineer and to administer remaining construction contracts in the area.

Work is 99.8 percent completed on Phase II of the Pueblo Fish Hatchery (rearing ponds). The balance is scheduled for completion by February of 1991. During 1990, the following species and numbers of fish were produced at the hatchery: McConaughy strain rainbow trout, 920,830; brown trout, 47,880; tiger muskie, 94,558; channel catfish, 192,640; saugeye, 7,662,152; walleye, 47,115,512; and hybrid striped bass, 2,152,946, for a total fish production of 58,186,518.

National Environmental Policy Act (NEPA) compliance was approved on August 1, 1989 for the Round II sale of an additional 51,500 acre-feet of water from Ruedi Reservoir. The 51,500 acre-feet under the approved plan will be reduced by 5,000 acre-feet to be released for the endangered fish of the Colorado River and by the 7,850 acre-feet of Round I sales. Round II water sales will be resumed in 1991.

Contents of reservoirs within the Fryingpan-Arkansas Project as of September 30, 1990, were as follows: Ruedi Reservoir, 92,302 acre-feet; Turquoise Lake, 125,517 acre-feet; Mt. Elbert Forebay, 9,644 acre-feet; Twin Lakes, 114,335 acre-feet; and Pueblo Reservoir, 116,870 acre-feet.

Transmountain diversions from the Colorado River Basin in Colorado during water year 1990 for the Colorado-Big Thompson and Fryingpan-Arkansas Projects were as follows: Alva B. Adams Tunnel, 216,800 acre-feet; and Charles H. Boustead Tunnel, 46,610 acre-feet.

b. Dallas Creek Project

Block Notice Number two was issued for the Dallas Creek Project on March 21, 1990. The notice includes all irrigation waters for the project, involving 11,200 acre-feet. The notice was issued to Tri-County Water Conservancy District. The first payment under the repayment contract will be made in February of 1993.

Block Notice Number one was issued on May 31, 1989, covering all municipal and industrial water use. The notice involves 28,100 acre feet of water. Repayment on that notice began in 1990.

c. Dolores Project

Construction of the Pleasant View - Ruin Canyon - Hovenweep pumping plants and laterals was completed in 1990.

Construction of Dove Creek Canal, Reach three is substantially complete.

A \$19.3 million contract for the construction of Reach one of the Towaoc Canal was awarded on September 11, 1989. It will include construction of approximately 8.8 miles of canal with an additional 2.7 miles of pipe laterals. Construction is scheduled for completion in April of 1992.

A \$14.5 million contract for construction of Towaoc Canal Reach two was awarded on July 24, 1990. Work includes construction of approximately 11.2 miles of canal with associated control and delivery features. Construction will be completed by January of 1993.

The Towaoc Canal is designed to serve the Ute Mountain Ute Indian tribal lands southwest of Cortez, Colorado, along with the Montezuma Valley Irrigation Company. The canal also will help to reduce salinity by replacing the existing Lower Hermana Lateral, the Highline Ditch and the Rocky Ford Ditch. The canal will be constructed in three reaches.

A \$5.9 million contract to install the turbine and generator of the Towaoc Powerplant was awarded on May 3, 1989. The contract calls for complete installation and testing of the power plant equipment by June of 1992. A \$14.4 million contract was awarded on September 6, 1990 for construction of the power plant building and penstock. Towaoc Powerplant will have an installed capacity of 11.4 MW and will generate an estimated 30,300,000 kilowatt-hours during each irrigation season from April to October. Power will be used for irrigation pumping on the Dolores Project. Any excess power will be combined with other CRSP power to be marketed by the Western Area Power Administration.

A \$2.6 million construction contract for the McPhee Dam Powerplant was awarded on May 29, 1990, with completion scheduled in 1992. The plant will have a capacity of 1.35 MW.



Dolores Project Irrigation, Colorado

—Bureau of Reclamation photo

A \$5.2 million contract to construct Dove Creek pumping plants in Cross Canyon, and Monument Creek lateral systems was awarded on February 15, 1990. The contract is scheduled for completion by the end of 1991.

A contract to install the master computer control system was awarded in May of 1989 and is scheduled for completion during the summer of 1992. A contract to install the communications system for the master computer control system was awarded in July of 1989 with completion also scheduled for the summer of 1992.

A contract for construction of the recreational facilities below McPhee Dam along the Dolores River was awarded in September of 1989. The contract is scheduled for completion by the end of 1991.

The first payment for Block Notice Number one, issued March 23, 1987 to the Dolores Water Conservancy District, was received in February of 1990. That notice is for all irrigatable land using supplemental water within the Montezuma Valley Irrigation Company's system.

Block Notice Number four was issued on September 4, 1990 and covers all irrigatable lands within Fairview and Cahone full-service pipeline lateral delivery systems. The notice is for 27,644 acre-feet of water. Repayment will begin on February 1, 1997.

Block Notice Number five was issued to the Ute Mountain Ute Indian Tribe for 1,000 acre-feet of municipal and industrial water. Pursuant to the Colorado Ute Indian Water Rights Settlement Act of 1988, the first repayment on February 1, 1991 will be for 160 acre-feet of water. Repayment on the remaining 840 acre-feet will be held until the water is first used.

Block Notice Number two was issued on May 29, 1987 and Block Notice Number three was issued on February 22, 1988.

d. Fruitland Mesa Project

Reclamation has requested that all the lands previously withdrawn for the Fruitland Mesa Project be terminated in their entirety. Through the Withdrawal Review Report submitted to the Bureau of Land Management, Reclamation has recommended that approximately 22,600 acres be returned to the public domain.

e. San Miguel Project - West Divide Project

Both projects have been found to be economically unjustified at this time. No activity has occurred on either project since 1982.

f. Bostwick Park Project

No Federal activity occurred on this project in water year 1990.

g. Florida Project

The Florida Water Conservancy District commenced generation at Lemon Dam (with their 110 KW generator) under a lease of power privilege from the Department of the Interior.

h. Dominquez Project (Whitewater)

All 28,445 acres of withdrawn Dominquez Project lands have been recommended by Reclamation for termination through the Withdrawal Review Report that was submitted to the Bureau of Land Management on December 29, 1988.

2. COLORADO AND NEW MEXICO

a. Animas-La Plata Project

Reclamation has completed its review of the Fish and Wildlife Service's Draft Biological Opinion with the assistance of a team of biology and hydrology experts from the States of Colorado, Utah, New Mexico and private interests. Reclamation is planning to provide the Fish and Wildlife Service with a proposed solution that could lead to a jeopardy opinion with reasonable and prudent alternatives to protect the endangered species. Reclamation has requested that that opinion be completed by April 1, 1991.

Reclamation's proposal will focus on three principal elements. First, a seven-year research project utilizing the operational flexibility of Navajo Reservoir. Additional water management and supply measures would be investigated to provide increased water, if needed, for the Colorado squawfish. Second, a San Juan River Basin Endangered Fishes Recovery Program would be initiated. The program would be similar to the existing program on the Green and Colorado Rivers in Colorado, Utah and Wyoming. Finally, the alternative would include construction of Ridges Basin Reservoir, Durango Pumping Plant and the inlet pipeline.

If the Biological Opinion issue is resolved by April 1, 1991, it is anticipated that a construction start can be initiated in the late spring or early summer of 1991.

3. COLORADO AND WYOMING

a. Savery-Pot Hook Project

Reclamation has submitted a Withdrawal Review Report to the Bureau of Land Management that will terminate all the withdrawn lands, totaling 11,303 acres, that were previously withdrawn from the public domain for construction of the Savery Pot-Hook Project.

4. NEW MEXICO

a. Navajo Indian Irrigation Project

Reclamation is continuing to progress toward completion of the Navajo Indian Irrigation Project in San Juan County, New Mexico.

Reclamation is providing design and construction management for the Bureau of Indian Affairs (BIA). In this process, funding is sought by BIA in its budget appropriation rather than by Reclamation.

Congress has continued its efforts to have the project completed. The Fiscal Year 1991 budget includes a \$17.9 million write-in for the project.

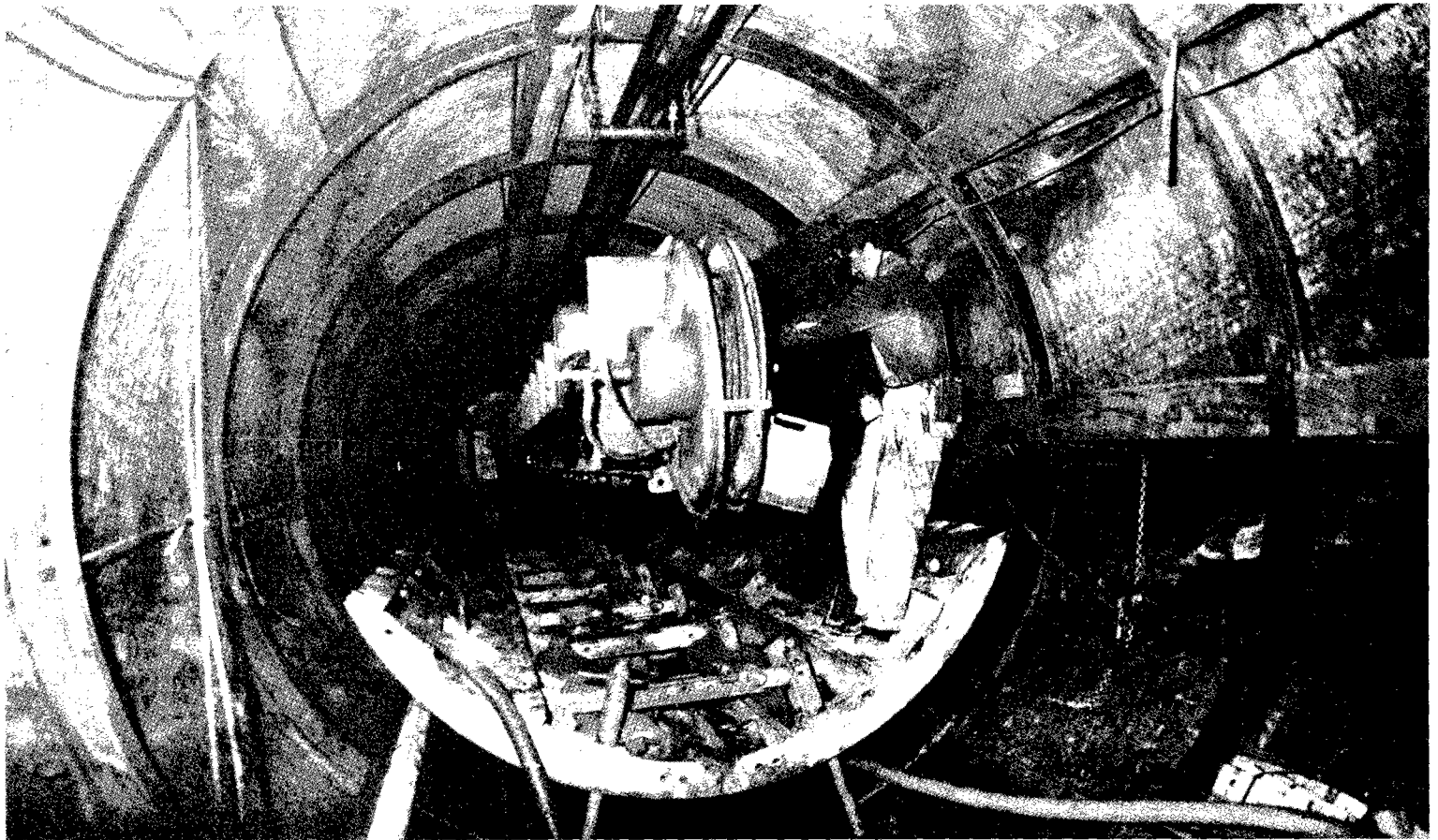
By the end of 1990, 6 blocks were completed which are capable of irrigating 60,000 acres of land. Construction of Block 7, Schedule 3, is underway and approximately 50 percent complete. Block 7, Schedule 4, is scheduled to be awarded when funds become available. The completion of Block 7 will add about 10,000 more acres of irrigated land to the project.

The entire project involves 11 blocks of construction and will have a total of 110,630 acres of irrigated land.

5. UTAH

a. Central Utah Project

The Central Utah Project will provide water for irrigation, M&I uses and power generation. Benefits will also be realized in the fields of outdoor recreation, fish and wildlife conservation, flood control, water quality control and area development. The Initial Phase consists of six units. Largest of these is the Bonneville Unit, which involves the diversion of water from the Uinta Basin, a part of the Colorado River Basin, to the Great Basin, with associated resource developments in both Basins. The other five units, Vernal, Uintah, Upalco, Jensen, and Ute Indian, provide for local development in the Uinta Basin.



Syar Tunnel, Diamond Fork System, Bonneville Unit, Central Utah Project, Utah

Revised 6/2/1964

i. **Bonneville Unit.** Stage II construction of Jordanelle Dam is well underway. The embankment is 25 feet above ground. During the winter months, crews are working in the river outlet tunnel. Work on the embankment will resume after the spring thaw.

Plans for construction in 1991 include diverting the Provo River through the outlet tunnel in early July. The gap in the embankment through which the river is now running will be filled, then the embankment will be placed across the entire valley.

Construction is still on schedule for a 1992 completion of embankment work. Work in 1993 will include installation of the gates and control structures. Filling will begin in 1994.

A contract has been awarded to remove the Olson/Niehart Tailings which are in the reservoir basin. Over 300,000 cubic yards of mine tailings will be removed. The major portion must be removed by July of 1991 so that construction of the dam will not be impacted.

Significant progress has been made concerning future recreation use at Jordanelle. The Jordanelle Master Plan was scheduled for completed in October of 1990. A contract for recreation management by the Utah Division of Parks and Recreation was signed in December of 1990. An Architectural and Engineering contract for design of recreation facilities will be awarded in February of 1991. Designs should be completed by July 1, 1992. The recreation construction contract should be awarded in late 1992 with completion by July 1994.

Construction is progressing on the Syar Tunnel. The contract was awarded in August of 1988. By the end of 1990, the 6.2 mile tunnel was completely excavated. The contractor has placed about 50 percent of the concrete lining in the tunnel, with completion of the contract anticipated not later than the spring of 1992.

The condemnation suit with Utah Power and Light Company for the acquisition of the Olmsted Diversion Dam, flowline, powerplant and water rights on the Provo River was settled in 1990.

The Supplement to the Final Environmental Statement for the Diamond Fork System was filed on February 26, 1990. The document addresses revisions to the proposed system that would provide the conveyance facilities for the Irrigation and Drainage System of the Bonneville Unit.



Big Sandy Dam Gates and Canal, Wyoming

Reclamation is receiving inquiries about power development on Diamond Fork. To facilitate non-Federal power development, Reclamation and the Western Area Power Administration have been considering the issuance of a Federal Register notice. Such notice would seek comments on proposed evaluation, selection and marketing criteria for non-Federal hydroelectric power development at Colorado River Storage Project and participating projects facilities.

Legislation was introduced in 1990 by the Utah congressional delegation to increase the ceiling for the Colorado River Storage Project, primarily to allow completion of the participating Central Utah Project Bonneville Unit. That legislation failed to pass and will be reintroduced in 1991.

Additional work will take place in 1991 at Upper Stillwater Dam. The Upper Stillwater boating site, access road, and work center construction contract was awarded in February of 1990 and will be completed by September 1991.

The Upper Stillwater campground relocation construction contract was awarded in February of 1989 and will be completed by July of 1991.

The Starvation Reservoir cooperative agreement to finish construction of recreation facilities will be awarded in January of 1991 and will be completed by September of 1992.

ii. Vernal Unit. Reclamation is presently gathering design data for designing modifications to Steinaker Dam as part of the Safety of Dams program. While the existing dam is structurally sound, modifications will enable the dam to better withstand an earthquake. It has been determined that during a strong earthquake, portions of the dam's foundation could liquefy. A structural modification of the dam is necessary to prevent that from happening. Tentative plans call for a construction contract for modifying the dam in June of 1992. Construction is expected to last one season, starting in the fall of 1992 and ending the following spring.

Work at Steinaker Dam will be timed so that there should be no interruption of water supplies from the dam to irrigators. The modification work will be timed such that activity requiring the drawdown of the water level will be performed in the fall after the irrigation season, with completion before spring runoff.

6. WYOMING

a. Lyman Project

Drilling activities under the Safety of Dams program at Meeks Cabin Dam concluded during the summer of 1987. A Modification Decision Analysis Report was completed in 1989. The first Corrective Action Study team meeting will be held in December of 1990.

b. Seekskadee Project

All construction at Fontenelle Dam has been completed and the operation of the facility restored to normal. The Bureau of Land Management is now administering the lands and recreation under the terms of an interagency agreement signed in August of 1989.

D. RECREATIONAL USES AT PARTICIPATING PROJECT RESERVOIRS

The following estimated recreation days occurred in 1989 (latest available figures) at the reservoirs listed below:

| Reservoir | Year First Visited | 1989 |
|--------------------------|---------------------------|------------------|
| Curecanti (Aspinall) | 1966 | 1,125,447 |
| Currant Creek | 1982 | 53,751 |
| Crawford | 1963 | 86,324 |
| Flaming Gorge | 1962 | 1,700,870 |
| Fontenelle | 1965 | 18,000 |
| Heron | 1973 | 112,575 |
| Huntington North | 1967 | 43,078 |
| Joes Valley | 1967 | 107,344 |
| Lake Powell | 1962 | 3,483,904 |
| Lemon | 1964 | 32,100 |
| McPhee | 1985 | 151,433 |
| Meeks Cabin | 1973 | 2,154 |
| Nambe Falls | 1977 | 30,107 |
| Navajo | 1963 | 503,227 |
| Paonia | 1962 | 11,739 |
| Red Fleet | 1982 | 30,121 |
| Ridgway | 1989 | 50,860 |
| Rifle Gap | 1967 | 87,120 |
| Silver Jack | 1973 | 66,790 |
| Starvation | 1970 | 40,640 |
| Stateline | 1982 | 5,600 |
| Steinaker | 1962 | 21,586 |
| Strawberry [enlargement] | 1985 | 192,153 |
| TOTAL | | 7,956,923 |

E. POTENTIAL PARTICIPATING PROJECTS

In carrying out further investigations of projects under Federal Reclamation laws in the Upper Colorado River Basin, the Secretary of the Interior is directed to give priority to completion of planning reports on a number of potential projects. Reclamation, so far as limited funds and personnel will permit, is continuing studies on these projects.

1. COLORADO

a. Grand Mesa Project

No activity has occurred on this project since 1982. A planning report concluding the study was approved July 13, 1982.

2. UTAH

a. Central Utah Project, Ute Indian Unit

No activity has occurred on this unit since 1980. A concluding report was approved on May 30, 1980.

3. WYOMING

a. Sublette Project

A concluding report was approved on April 24, 1980.

F. STATUS OF OTHER BUREAU OF RECLAMATION PROJECTS IN THE UPPER COLORADO RIVER BASIN

1. COLORADO

a. Fruitgrowers Dam Project

Reclamation has recently entered an agreement with the Audubon Society to manage the lands around Fruitgrowers for wildlife habitat enhancement and viewing.

b. Uncompahgre Project

The Final Environmental Impact Statement for the AB Lateral Hydro-power Project was filed on August 28, 1990. The proposed 42 megawatt facility would be privately funded. The project is on hold pending resolution of Gunnison River flow issues in the Black Canyon of the Gunnison National Monument.

G. INVESTIGATIONS

The Fiscal Year 1991 budget for the planning program is about \$2.6 million, with about 80 percent being directed within the Upper Colorado River Basin. Active studies include the salinity control efforts for the Price-San Rafael, Glenwood-Dotsero Springs, and San Juan River Units, plus additional studies in areas such as diffuse source control and industrial use and co-generation/desalination opportunities in the basin.

Other active studies are: Upper Gunnison-Uncompahgre Basin, Sevier River Water Management, Four Corners Water Assessment and the Utah Area Water Demand Model. The New Mexico Regional Water Resource Study was begun this year. Reclamation also continues to provide assistance as requested through Technical Assistance to the States activities as well as activities of environmental and interagency coordination and other minor work. Continuing this year is a program for evaluating system optimization on some existing projects with several scheduled for evaluation.

I. COLORADO

a. Upper Gunnison-Uncompahgre Basin Study

Phase I of this study was conducted by the Colorado Water Resources and Power Development Authority with assistance from Reclamation, and was completed in 1989. Phase I involved an appraisal-level study of the recreation and water supply development opportunities in the basin, including the potential for transmountain diversion of water to the east slope for municipal and industrial uses.

Phase II was initiated in 1990. It is co-sponsored by seven Federal, State and local entities and will define the hydrology and water rights in the basin and develop two computer models. One model will be a water accounting spreadsheet that will accurately reflect the daily administration of the major water rights and exchanges in the Gunnison Basin. The second will be a computer based planning model for the basin. Reclamation investigation funds are being used in Fiscal Year 1991 to continue the study.

b. Four Corners Water Assessment

This investigation began in Fiscal Year 1990 and will continue in Fiscal Year 1991 to investigate and recommend more effective management and use of water resources in the Four Corners area. The study also will

characterize water quality and environmental problems associated with water development and supply facilities.

2. UTAH

a. Sevier River Water Management Studies

This study will continue in Fiscal Year 1991. A status report was completed in 1990. Included in the study is the installation of a system to accelerate data collection and the distribution of data to water managers, the development of a system of computer graphics to facilitate data interpretation, and the evaluation or development of real-time models to assist decision-makers with water accounting and operation. The operating models would be useful for water deliveries, minimizing flood damage, protecting aquatic habitat, improving water quality, and maximizing power generation.

b. Utah Area Water Demand Model

This study will continue in Fiscal Year 1991. A status report will be completed in early 1990. The study will develop an interactive computer model to be used by water managers and planners to forecast changing municipal and industrial water demands, to evaluate water conservation implementation strategies and to develop drought contingency plans. The model will be a critical element in developing long-term forecasts and prioritizing future water resource strategies involving system optimization and water conservation options and impacts. It also will assist in evaluating the short-term options necessary to operate better the existing urban infrastructure.

H. RESERVOIR OPERATIONS

Water supply conditions during water year 1990 have continued to be much below normal, the result of below-normal precipitation for the last four years. Stream flows are currently below normal in the northern portion of the basin but considerably above normal in the San Juan drainage. The soil moisture is still quite low and is expected to affect the quantity of next spring's runoff. Releases at each mainstem dam are currently near minimum levels. The conditions change from what is expected, adjustments will be made in operations to insure that mainstem reservoirs are kept at appropriate levels.

1. ANNUAL OPERATING PLAN DEVELOPMENT

On September 29, 1989, Secretary of the Interior Manuel Lujan, Jr. transmitted letters approving an Annual Operating Plan for water year 1990. The Operating Plan was developed through the cooperation of representatives of the seven Basin States, the Bureau of Reclamation, Western Area Power Administration, and other agencies.

Development of the Annual Operating Plan was accomplished with consideration of the following major points:

1. No flood control releases are anticipated from Lake Mead.
2. There will be no excess water releases to provide a storage buffer in Lake Mead.
3. The guaranteed annual quantity of 1.5 million acre-feet will be delivered to Mexico.
4. All requests by Lower Basin main stream holders of surplus water contracts in the U. S. will be fully satisfied. California's water contract holders will be allowed to use water apportioned to but not used by the States of Arizona and Nevada.
5. Salinity provisions of Minute 242 will be met.

2. RUNOFF, RESERVOIR CONTENTS AND RELEASES

In 1990 the snow melt inflow into Lake Powell during the April through July period totaled 3.2 million acre-feet (MAF) that is approximately 40 percent of the long-term average. The computed unregulated discharge at Lee Ferry for the water year ending September 30, 1990 was 5,452,000 acre-feet and ranks as the fifth lowest year of record. The following tabulation lists the breakdown of discharges in acre-feet basin wide.

| | | Acre-feet |
|--|---|------------------|
| Net change in surface storage | - | 3,357,000 |
| Net change in bank storage | - | 81,000 |
| Net evaporation | + | 628,000 |
| Glen Canyon releases | + | 8,251,000 |
| Paria River discharge | + | <u>11,000</u> |
| Total Unregulated Discharge at Lee Ferry | + | 5,452,000 |

In water year 1990, Upper Basin reservoirs had a decrease of 3,357,000 acre-feet in storage, and Lake Mead decreased storage by 1,399,000 acre-feet.

Water supply conditions during water year 1990 have continued to be much below normal because of very little precipitation in the spring and summer months.

During the next year, Reclamation will attempt to refill the mainstem reservoirs above Lake Powell. All the reservoirs should refill, with the exception of Flaming Gorge, which is expected to be approximately six feet short of filling. The refilling of the upstream reservoirs combined with the dry basin conditions are expected to reduce regulated inflow into Lake Powell by approximately 3.6 MAF. The most probable high content of Lake Powell is expected to be just over 19 MAF. Considering the current amount of storage and the level of expected runoff, the risk of spilling is negligible.

a. Lake Powell

Lake Powell reached its high 3,665.20 feet on October 1, 1989, with a usable surface storage of 19,805,000 acre-feet. By September 29, 1990 the elevation was drawn down to 16,249,000 acre-feet, the minimum for water year 1990.

At Lee Ferry, the calculated discharge for the water year ending September 30, 1990 was 7,952,000 acre-feet, including approximately 11,000 acre-feet from the Paria River.

Lake Powell finished the 1990 water year with a total annual release of 8.25 million acre-feet all of which went through the power plant. By careful planning and discussions among the Federal/State work group members, Western Area Power Administration, and the researchers involved in the GCES monthly release volumes were tailored to meet the winter and summer power demand patterns and the test flows required for the GCES within an 8.23 MAF release schedule. By careful coordination among the various agencies, the GCES test flows have been kept on schedule even though there was record-breaking heat in the Southwest during the water year.

b. Flaming Gorge Reservoir

The water surface of Flaming Gorge Reservoir on the Green River was at its highest elevation of the year on September 13, 1990, with usable surface storage of 3,093,000 acre-feet at elevation 6,023.26 feet.

Releases from Flaming Gorge have been at or near minimum levels since the spring of 1988 due to drought conditions in the Green River Basin. Inflow into the reservoir during the April-July runoff period was 597,000 acre-feet, or approximately 47 percent of normal, leaving the reservoir approximately 17 feet short of filling. Releases from the reservoir were constrained to a maximum of 2,600 cubic feet per second (cfs) from mid-July through October to provide interim protection for the endangered Colorado squawfish.

Due to the initiation of test flows at Glen Canyon Dam, releases from Flaming Gorge were increased above minimum levels during the latter part of the water year in order to give the Western Area Power Administration more flexibility in keeping the power system whole in the event of an emergency. This was done with the understanding that Flaming Gorge would only be used as a last resort (i.e., power from other sources could not be purchased). Even with this increase, releases average only 1,000 cfs for the water year. Even with the continuation of the test flows in 1991 and the expected inflow in 1991 being only 75 percent of normal, Flaming Gorge is expected to be within 10 feet of filling in 1991.

c. Fontenelle Reservoir

The water surface of Fontenelle Reservoir was at its highest elevation of the year July 30-31, 1990, with usable surface storage of 335,000 acre-feet.

The year 1990 was the first full year of normal operations at Fontenelle Dam since the modification work on the dam was completed. Inflow into Fontenelle during the April-July runoff period was 524,000 acre-feet, or approximately 60 percent of normal. With this low runoff, only 38,000 acre-feet of water were bypassed during the water year.

During water year 1991, Fontenelle Reservoir will be drawn down to minimum power pool. Under all but the most adverse conditions, the reservoir should fill again in 1991.

d. Navajo Reservoir

Navajo Reservoir reached its maximum content of 1,379,00 acre-feet at elevation 6,062.74 on July 17, 1990. The end-of-year content was 1,361,000 acre-feet. About 147,000 acre-feet were delivered to the Navajo Indian Irrigation Project. Releases from the reservoir were at or near minimum levels throughout the 1990 water year. The observed inflow into Navajo Reservoir for the April-July runoff period was 424,000 acre-

feet, or 55 percent of normal. The reservoir was approximately 22 feet short of filling.

Due to the continuance of minimum flows and the occurrence of late season storms, storage in Navajo Reservoir has returned to more normal levels.

With the recovery of storage and a favorable forecast of inflow for 1991, Navajo Reservoir should fill and spill during the 1991 water year.

e. Blue Mesa Reservoir

Blue Mesa Reservoir was at its high elevation of 7,503.10 feet on July 10, 1990, with a content of 687,000 acre-feet. Total releases from Blue Mesa were 527,000 acre-feet, all of which went through the power plant. Releases from the Aspinall Unit were at minimum levels throughout the 1990 water year. Unregulated inflow to Blue Mesa Reservoir during the April-July runoff period was only 585,000 acre-feet, or 84 percent of normal. With this low runoff and the low storage in the reservoir, Blue Mesa was approximately 17 feet short of filling in 1990.

Although Blue Mesa did not fill in 1990, storage in the reservoir has returned to more normal levels due to the continuance of minimum releases. This, combined with an improving forecast of inflow for 1991, indicates that Blue Mesa should fill in 1991. Flows in the Black Canyon of the Gunnison National Monument are expected to average about 800 cfs through the recreation season.

f. Morrow Point Reservoir

Morrow Point Reservoir was operated between 110,000 and 115,000 acre-feet, its full-stage capacity, during water year 1990.

g. Crystal Reservoir

Total releases from Crystal Dam were 659,000 acre-feet, with 617,000 acre feet going through the power plant and 42,000 acre-feet being bypassed.

I. FISH AND WILDLIFE

The Colorado River Endangered Fishes Recovery Program is in its third year of implementation. For Fiscal Year 1991, approximately 35 projects have been funded totaling almost \$2.8 million. Several new research initiatives were funded including the investigation of chemical cues believed to be important in the migration and spawning of several endangered species. Other new activities to be initiated in 1991 include research in the area of genetics and propagation of the various populations of Colorado squawfish and razorback sucker. These activities are believed to be important in future recovery activities in the Upper Colorado Basin.

Concerning sufficient progress, the U.S. Fish and Wildlife Service (FWS) and The Nature Conservancy (TNC) have been working on acquiring water rights on the Yampa River. The FWS and other program participants are actively working on the identification of flows necessary for the protection of the endangered fish, while TNC is pursuing the acquisition of water rights. In addition to the Yampa River activities, FWS has identified flows necessary for the protection of the endangered fishes in the 15-mile reach below the Grand Valley Diversion Dam on the Colorado River. Water provided from Ruedi and Green Mountain Reservoirs as conditions of a Section 7 consultation are being monitored in this reach by FWS. *

The FWS and Reclamation are still finalizing the reports necessary for completing consultation on the operation of Flaming Gorge Dam. The consultation process for Flaming Gorge Dam and the Aspinall Unit was significantly delayed in 1990 as work focused on the San Juan River and consultation on the Animas-La Plata Project. While the San Juan River is not part of the Recovery Implementation Program, the need to evaluate and complete consultation on Animas-La Plata became a high priority for the FWS and Reclamation, thus delaying much of the other Bureau of Reclamation Section 7 activities.

To date, the activities relative to the San Juan River and consultation on the Animas-La Plata Project have led to the possible development of another Recovery Implementation type of program for the San Juan River Basin. The goal of the program would be to protect and recover the endangered fish in the San Juan River while providing a consultation process for future water development by the States of New Mexico, Colorado and Utah.

J. APPROPRIATION OF FUNDS BY THE UNITED STATES CONGRESS

The funds appropriated for fiscal year 1991 for construction of the Colorado River Storage Project, participating projects, and recreational and fish and wildlife activities totaled \$172,031,000, including \$775,000 for drainage and minor construction. Recreation and fish and wildlife activities received a total of \$26,968,000, with \$11,836,000 for recreation and the balance for fish and wildlife.

In addition, under the Colorado River Basin Salinity Control Program, \$14,732,000 were appropriated for the Grand Valley Unit, \$3,380,000 for the Paradox Valley Unit, and \$4,726,000 for Stage 1 of the Lower Gunnison Unit.

Table 5, page 63, illustrates a general recapitulation of action by the Second Session of the 101st Congress pertaining to appropriations of funds for the construction program of the Colorado River Storage Project and participating projects.

Table 6, page 64, shows the total funds appropriated by the U. S. Congress for the Colorado River Storage Project and participating projects and chargeable against the limitations of various authorizing Acts (P.L. 485, 84th Congress, Colorado River Storage Project Act, as amended in 1972 by P.L. 32-370 and in 1988 by P.L. 100-563; P.L. 87-485, San Juan-Chama and Navajo Indian Irrigation Projects Act; P.L. 88-568, Savery-Pot Hook, Bostwick Park, Fruitland Mesa Projects Act; P.L. 90-537, Colorado River Basin Project Act).

Table 5

COLORADO RIVER STORAGE PROJECT
FISCAL YEAR 1991 PROGRAM

| Project and State | Budget Estimate | House Allowance | Senate Allowance | P.L. 101-514 Nov. 5, 1990 |
|--|----------------------|----------------------|----------------------|------------------------------|
| Colorado River Storage Project | | | | |
| Participating Projects: | | | | |
| Animas-La Plata - Colorado | \$ 13,415,000 | \$ 13,415,000 | \$ 13,415,000 | \$ 13,415,000 |
| Central Utah Project - Utah | | | | |
| Bonneville Unit | 81,773,000 | 81,773,000 | 81,773,000 | 81,773,000 |
| Uintah Unit | 50,000 | 50,000 | 50,000 | 50,000 |
| Dolores Project - Colorado | <u>49,050,000</u> | <u>49,050,000</u> | <u>49,050,000</u> | <u>49,050,000</u> |
| | \$144,288,000 | \$144,288,000 | \$144,288,000 | \$144,288,000 |
| Drainage and Minor Construction | | | | |
| Central Utah Project - Utah | | | | |
| Jensen Unit | 30,000 | 30,000 | 30,000 | 30,000 |
| Dallas Creek Project - Colorado | <u>745,000</u> | <u>745,000</u> | <u>745,000</u> | <u>745,000</u> |
| | \$ 775,000 | \$ 775,000 | \$ 775,000 | \$ 775,000 |
| TOTAL - Upper Colorado River Basin Fund | <u>\$145,063,000</u> | <u>\$145,063,000</u> | <u>\$145,063,000</u> | <u>\$145,063,000</u> |
| Recreational and Fish and Wildlife Facilities | | | | |
| Recreational Facilities | \$ 11,836,000 | \$ 11,836,000 | \$ 11,836,000 | \$ 11,836,000 |
| Fish and Wildlife Facilities | <u>15,132,000</u> | <u>15,132,000</u> | <u>15,132,000</u> | <u>15,132,000</u> |
| | \$ 26,968,000 | \$ 26,968,000 | \$ 26,968,000 | \$ 26,968,000 |
| TOTAL - Colorado River Storage Project | <u>\$172,031,000</u> | <u>\$172,031,000</u> | <u>\$172,031,000</u> | <u>\$172,031,000</u> |

Table 6

APPROPRIATIONS BY THE CONGRESS
for the
COLORADO RIVER STORAGE PROJECT AND
PARTICIPATING PROJECTS

| <u>Fiscal Year</u> | <u>Amount</u> |
|---|---------------------|
| 1957 | \$ 13,000,000 |
| 1958 | 35,142,000 |
| 1959 | 68,033,335 |
| 1960 | 74,459,775 |
| 1961 | 58,700,000 |
| 1962 | 52,534,500 |
| 1963 | 108,576,000 |
| 1964 | 94,036,700 |
| 1965 | 55,800,000 |
| 1966 | 45,328,000 |
| 1967 | 46,648,000 |
| 1968 | 39,600,000 |
| 1969 | 27,700,000 |
| 1970 | 25,740,000 |
| 1971 | 24,230,000 |
| 1972 | 27,284,000 |
| 1973 | 45,770,000 |
| 1974 | 24,426,000 |
| 1975 | 22,967,000 |
| 1976 | 38,160,000 |
| Transition Quarter (July, August, September 1976). . . . | 15,562,000 |
| 1977 | 55,200,000 |
| 1978 | 67,051,000 |
| 1979 | 76,799,000 |
| 1980 | 81,502,000 |
| 1981 | 125,686,000 |
| 1982 | 130,063,000 |
| 1983 | 132,942,000 |
| 1984 | 161,104,000 |
| 1985 | 163,503,000 |
| 1986 | 97,412,000 |
| 1987 | 110,929,000 |
| 1988 | 143,143,000 |
| 1989 | 174,005,000 |
| 1990 | 163,653,000 |
| 1991 | 145,063,000 |
| TOTAL | \$2,771,752,310 |
| Plus: Navajo Indian Irrigation Project Appropriations | 291,383,385 |
| TOTAL APPROPRIATIONS | \$3,063,135,695 |

Exclusive of non-reimbursable funds for fish and wildlife, recreation, etc.,
under Section 8 of P. L. 485, 84th Congress.

WATER QUALITY PROGRAM IN THE UPPER COLORADO RIVER BASIN

(Information relative to the Water Quality Program in the Upper Colorado River Basin has been obtained from the United States Department of the Interior, Bureaus of Reclamation and Land Management, and the United States Department of Agriculture, Soil Conservation Service.)

Title II of the Colorado River Basin Salinity Control Act, Public Law 93-320 (approved June 24, 1974) authorized and directed the Secretary of the Interior to construct, operate and maintain four salinity control units as the initial stage of the Colorado River Basin Salinity Control Program and to expedite completion of the planning reports on twelve units. Title II also provided for the establishment of the Colorado River Basin Salinity Control Advisory Council. Public Law 98-569, the Colorado River Basin Salinity Control Act, Amendment, was passed by the 98th Congress and signed by the President on October 30, 1984.

The 1984 Amendments to the Colorado River Salinity Control Act required the Secretary of the Interior to develop a comprehensive program to minimize salt contributions from lands administered by the Bureau of Land Management (BLM). The July 1987 Report to Congress, "Salinity Control on BLM-Administered Public Lands in the Colorado River Basin," addressed the extent of salt contributed from public lands, current actions and future recommendations to achieve the objective of minimizing salinity contributions while recognizing multiple-use objectives and authorized uses.

During water year 1990, the BLM completed vegetation/soil inventories on 477,000 acres in three states: Colorado (100,000 acres), Wyoming (197,000 acres), and Utah (Kane County, 180,000 acres).

Phase I - Priority Ranking of watersheds for salinity in the Colorado River Basin portion of Utah was conducted with an interagency team effort. All involved with the process were pleased with the results and comfortable with the rankings. The effort covered 2,780,000 acres and was accomplished in about two weeks.

Phase II - Reconnaissance Planning was initiated on the eight highest priority watersheds with the interagency team in Utah. BLM initiated a coal bed methane gas study in Colorado.

Phase III - Comprehensive Planning for the highest priority Utah-BLM watershed, - Sagers Wash was started. It will be completed in the spring of 1991. Other efforts included Grand Valley, Lower Wolf Creek and Disappointment Valley in Colorado; Wells Draw, Sweetwater and Castle Peak in Utah; and Current Creek and Austin-Triangle in Wyoming.

Phase IV - Implementation was completed on two retention dikes and one drop structure at Sagers Wash in Utah. Wyoming completed a retention structure on Bone Draw and willow plantings on Sage Creek. Utah finished 29 structures on Pariette Draw and 22 small structures in the Sweetwater area.

Phase V - Maintenance was performed in Utah on Huffaker Hollow and Crescent Dams, several small structures in Clayhole Basin, Henry Mountains and Diamond Mountain areas. Wyoming maintained four small structures.

Phase VI - Monitoring continued in Colorado on Vermillion Creek; in Utah on Montezuma, Indian, Sagers and Bull Creeks; and in Wyoming on twenty-six allotments in Green River/Pinedale areas.

Many of the reconnaissance findings and existing plans exhibit an attractive cost effectiveness for retaining salt-laden sediment on rangelands. Each rangeland area has its own specific problems and constraints which must be carefully understood to prescribe the best management treatments and practices.

A. COLORADO RIVER BASIN SALINITY CONTROL PROGRAM

Section 202 of the Title II of Public Law 93-320 authorized the Secretary of the Interior to construct, operate and maintain four salinity control units as the initial stage of the Colorado River Basin Salinity Control Program. The four units are Paradox Valley, Grand Valley, Crystal Geyser and Las Vegas Wash. Public Law 98-569, dated October 30, 1984, deauthorized Crystal Geyser.

This section of the act also authorized the Secretary of Agriculture to establish a voluntary salinity control program with landowners. Under this authority, rules and regulations were developed for the United States

Department of Agriculture (USDA) Colorado River Salinity Control program, and in 1987 Congress appropriated the initial funds for implementation. Under this program, farmers within designated salinity control areas agree, by means of long-term contracts, to install salinity reduction practices. The USDA program is underway in the Grand Valley, Lower Gunnison and McElmo Creek areas in Colorado, and in the Uintah Basin area of Utah and the Big Sandy River area in Wyoming.

1. PARADOX VALLEY UNIT

The Paradox brine collection system, treatment facility and disposal well have been completed and testing will start in the spring of 1991. In the fall of 1990, some equipment testing took place to insure that pumps and other such equipment were working properly. Pre-flooding of the receiving aquifer with fresh water will begin in preparation for a two-year test injection. The two-year testing program consists of verification and refinement of well field, controlling brine inflow to the river, design data collection, verification of techniques to control chemical precipitation, and testing of the injection well and receiving aquifer properties. This data will be used to supplement the definite plan report and final environmental statement.

2. GRAND VALLEY UNIT

Reclamation's canal and lateral lining program will continue in 1991. Construction on the West End Canal and Laterals will be completed this year, reducing salinity by additional 20,000 tons per year. Construction on the private system is scheduled to commence this year under construction cooperative agreements with the Palisade and Mesa County Irrigation Districts. In 1991, over 1,000 acres of land will be in development as wildlife habitat replacement.

Salinity control actions were initiated in the Grand Valley in 1979 under existing USDA authorities. In 1987 funding became available for implementation under the USDA Colorado River Salinity Control program. As of September 30, 1990, 367 miles of underground pipelines, gated pipe, and concrete-lined ditch have been installed. In addition, 4,000 acres of land have been leveled and other salinity reduction practices installed such as surge, drip and cablegation irrigation systems. In addition, wildlife habitat practices are being applied. Technical assistance is provided to all participants on irrigation water management. The annual salt-load reduction achieved is 39,000 tons.

B. COLORADO RIVER WATER QUALITY IMPROVEMENT PROGRAM

Section 203 of Title II of Public Law 93-320 authorized and directed the Secretary of the Interior to expedite completion of the planning reports on twelve units. The Secretary of Agriculture was directed to cooperate in the planning and construction of on-farm system measures. Public Law 98-569 authorized the Secretary of Agriculture to establish an on-farm voluntary cooperative salinity control program with landowners.

1. UINTAH BASIN UNIT

This unit would reduce salinity by 21,000 to 30,000 tons per year by improving 56 miles of canals and laterals in the Uinta Basin. Planning on this unit was essentially completed with the filing of the Planning Report/Final Environmental Statement in 1987. Some limited opportunities have been explored to improve the effectiveness of the unit. These studies recommend including 3.2 miles of the Myton Townsite Canal in the canal-lining program. Land retirement will be assessed in an appraisal study in Fiscal Year 1991.

The request for construction authorization of the Uintah Basin Unit was temporarily suspended in 1987 due to constraints placed on Reclamation's construction budget. In 1989, Reclamation requested the Secretary of the Interior to reconsider seeking authorization for this unit. The Department of the Interior has forwarded this request to the Office of Management and Budget (OMB) for recommendations.

The USDA program has been underway in the Uinta Basin since 1980 when implementation was initiated under existing USDA authorities. Funding under the USDA salinity control program began in 1987. Since that time, nearly 300 participants have signed salinity control contracts. As of September 30, 1990, 689 sprinkler systems have been installed on 56,000 acres. In addition, 487 miles of pipeline have been installed to reduce seepage from earthen laterals and on-farm ditches. Irrigation water management is being applied on 49,000 acres. Participants are also installing wildlife habitat practices. The annual salt-load reduction achieved since the program started is 45,000 tons.

2. BIG SANDY RIVER UNIT

Funding for salinity control contracts has been available in the Big Sandy River area for three years. As of September 30, 1990 thirteen contracts have been signed by farmers. Participants have installed eleven low-pres-

sure sprinkler systems and improved a surface irrigation system with underground pipeline and gated pipe. Wildlife habitat practices are also being applied. A total salt-load reduction of 4,900 tons has been achieved.

3. LOWER GUNNISON BASIN UNIT

Construction of the Winter Water Alternative was initiated in Fiscal Year 1990 and will continue in 1991. The five-year plan of development provides for eliminating winter livestock water deliveries made through the Uncompahgre Valley Water Users canal system. Stockwater will be provided by expanding the existing culinary water system with small-diameter PVC pipe and stock tanks. Construction of the water delivery system is being accomplished by the local water users through construction cooperative agreements with Reclamation.

Funding for salinity control contracts with farmers and groups in the Lower Gunnison area has been available for three years. As of September 30, 1990 forty contracts have been signed by participants. Since the program was initiated, eighteen miles of pipelines, gated pipe and concrete-lined ditch have been installed. Surge irrigation systems, sprinkler systems, water control structures and wildlife habitat practices have also been installed. A salt-load reduction of 2,000 tons per year has been achieved.

4. PRICE-SAN RAFAEL RIVERS UNIT

A planning report/environmental impact statement will be completed in Fiscal Year 1991 for salinity-related irrigation improvements in these two river basins. The plan calls for Reclamation to install 97 miles of piped laterals to create pressure for sprinkler systems to be installed under the SCS on-farm program. The plan would also provide culinary water to replace winter stockwatering from the canals. This unit will reduce salinity by 162,900 tons per year. The unit's cost effectiveness has been estimated at \$55 per ton of salt removal.

5. DIRTY DEVIL RIVER UNIT

A planning report concluding the study was approved in June of 1987.

6. SAN JUAN RIVER UNIT

A planning report/environmental statement will be completed in Fiscal Year 1991 for the salinity-related rehabilitation of the 19.5 miles of the Main Canal, 3.9 miles of the Gravity Extension Lateral, 2.3 miles of the East Highline Lateral and 1 mile of the Wet Highline Lateral. It is estimated that these improvements will reduce salinity by 27,000 tons per

year. Construction costs have been estimated at \$10 million. The cost effectiveness of this unit is unusually favorable (\$35 per ton) due to the good condition of the drop and cross drainage structures. SCS is conducting preliminary investigations to explore the potential for a USDA on-farm program in the San Juan River Basin.

7. DOLORES/McELMO CREEK UNIT

The McElmo Creek Unit of the Salinity Control Program was authorized as a new project feature of the Dolores Project, CRSP, by Public Law 98-569 in 1984. The supplement to the environmental statement adding salinity control as a project feature of the Dolores Project was completed, approved and filed in March of 1989. Salinity control features include Reaches 1 and 2 of the Towaoc Canal and the Rocky Ford, Lone Pine, and Upper Hermana Laterals. Construction on Reaches 1 and 2 will continue in Fiscal Year 1991.

USDA allocate first year cost-share funds for salinity control contracts to this project in 1990 and started implementation. During the fiscal year, nine contracts were signed with individuals, and installation of salinity practices began. In this first year of implementation, six sprinkler systems and four miles of underground and gated pipe were installed. The annual salt-load reduction achieved is 540 tons. Coordination of the on-farm salinity control actions with the Bureau of Reclamation canal and lateral construction program continues.

8. GLENWOOD-DOTSERO SPRINGS UNIT

Reclamation is pursuing the evaluation of a potential industrial use alternative for this unit. The potential development would include the use of waste heat from a natural gas turbine power plant to desalinate a portion of the saline springs water in Glenwood Springs, Colorado. The byproduct salt could be marketed by the developer to replace salt that is imported into the Colorado River Basin. The desalinated water would either be returned to the Colorado River or marketed to some local users. Reclamation has completed a competitively negotiated cooperative agreement for the planning, construction and operation of the facility with the developer.

The process would prevent approximately 65,000 tons of salt per year from entering the river system. The cooperative agreement was signed in the fall of 1989. In Fiscal Year 1991, Reclamation and the developer will continue to cooperate to prepare an environmental assessment and the necessary documents to seek authorization of the project from Congress.

WEATHER MODIFICATION

Research experiments and operational cloud seeding projects indicate that weather modification has the potential to increase mountain snowfall, thus augmenting water supplies in the Colorado River Basin.

Seeding winter orographic clouds to increase snowfall may be the best major alternative to help meet long-range problems in the Colorado River area. Before this can happen, the remaining scientific uncertainties need to be resolved to develop an improved technology and a practical demonstration and evaluation of water production.

The Upper Colorado River Commission has urged Congress to appropriate funds for the Bureau of Reclamation to maintain and improve the Federal capability in precipitation management research, to further the transfer of this technology to operational plans, to enable acceptance of State commitments for cooperative applied research programs, and to further the understanding of global climatological changes. The Commission has also urged Congress to obtain appropriate assurances that the Department of the Interior is giving high priority to delineating and implementing, in a timely manner, the most appropriate means of augmenting the Colorado River to satisfy the national obligation of meeting the Mexican Water Treaty, as mandated by the Colorado River Basin Project Act, so as not to diminish the already deficient river supply available to the Colorado River Basin States.

FINDINGS OF FACT

No findings of fact pursuant to Article VIII of the Upper Colorado River Basin Compact has been made by the Upper Colorado River Commission. No part of this Annual Report is to be construed as a finding of fact by the Commission.

ACKNOWLEDGMENTS

The Upper Colorado River Commission wishes to thank the Governors of Colorado, New Mexico, Utah and Wyoming for their interest in and support of the Upper Colorado River Commission.

The Commission especially wishes to give recognition to the difficult and able work of the members of the United States Congress from the Upper Division States of the Colorado River Basin and to acknowledge with appreciation the assistance it has received from agencies of the Executive Branch of the Federal Government, the Department of the Interior, Bureau of Reclamation, Bureau of Land Management, Geological Survey, Bureau of Indian Affairs, Western Area Power Administration, the National Weather Service and the Department of Agriculture.

The diligent devotion to duty by departments of health and environment, water pollution control commissions, and counterpart organizations of the Upper Division States in aiding in the resolution of pollution and salinity problems of the Upper Colorado River System deserves special commendation.

Special recognition and appreciation is due to the Colorado River Basin Salinity Control Forum, several of whose members are advisers closely associated with the Commission, for the excellent work accomplished on the difficult salinity problems of the Colorado River.

Officers and personnel of many State agencies having their primary interests in various phases of water resources have also aided materially with cooperative efforts and information.

**RESOLUTIONS
OF
UPPER COLORADO RIVER COMMISSION**

RESOLUTION
of
UPPER COLORADO RIVER COMMISSION

In Memoriam
STEPHEN E. REYNOLDS

WHEREAS, through the death of Stephen E. Reynolds, the States of the Upper Division of the Colorado River Basin have lost a most distinguished and devoted citizen; and

WHEREAS, Stephen E. Reynolds had a long and illustrious career as State Engineer for the State of New Mexico; and

WHEREAS, Stephen E. Reynolds applied his unique skills as an engineer and negotiator in the development of the Colorado River; and

WHEREAS, Stephen E. Reynolds' devotion to water resource development in the State of New Mexico and the Colorado River Basin earned the total respect and sincere affection of everyone associated with the Upper Colorado River Commission; and

WHEREAS, Stephen E. Reynolds served as a member of the Engineering Committee of the Upper Colorado River Commission for over 30 years and as Upper Colorado River Commissioner for the State of New Mexico for over 10 years; and

WHEREAS, Stephen E. Reynolds' wise counsel, unselfish dedication, and energetic leadership will be sorely missed:

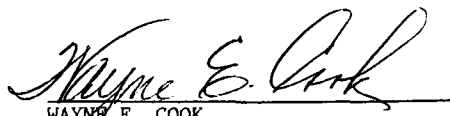
NOW, THEREFORE, BE IT RESOLVED that the Upper Colorado River Commission, at its Adjourned Regular and Adjourned Annual Meetings held in Salt Lake City, Utah on September 20, 1990, expresses its appreciation for the constant and untiring efforts of Stephen E. Reynolds in the development of the water resources of the Upper Colorado River Basin and extends to his family its deepest sympathy and understanding of their unique loss;

BE IT FURTHER RESOLVED that the Executive Director of the Upper Colorado River Commission is hereby directed to forward copies of this unanimously adopted resolution to Stephen E. Reynolds' daughter, Nancy Treat, and to the Governor of New Mexico.

CERTIFICATE

I, WAYNE E. COOK, Executive Director and Secretary of the Upper Colorado River Commission, do hereby certify that the above Resolution was adopted by the Upper Colorado River Commission at its Adjourned Regular and Adjourned Annual Meetings held in Salt Lake City, Utah on September 20, 1990.

WITNESS my hand this 24th day of September, 1990.


WAYNE E. COOK
Executive Director and Secretary

RESOLUTION
of
UPPER COLORADO RIVER COMMISSION

Honoring Philip B. Mutz

WHEREAS, Philip B. Mutz worked for many years as Interstate Stream Engineer for the New Mexico Interstate Stream Commission; and

WHEREAS, Philip B. Mutz served on the Engineering Committee of the Upper Colorado River Commission and as Alternate Commissioner for the State of New Mexico for 10 years; and

WHEREAS, Philip B. Mutz served as Upper Colorado River Commissioner for the State of New Mexico; and

WHEREAS, Philip B. Mutz has rendered long, meritorious service to the Upper Colorado River Commission and the State of New Mexico in negotiations relating to the conservation, utilization, and development of the water and related land resources of the Upper Colorado River Basin; and

WHEREAS, Philip B. Mutz always ably and honorably performed his duties with the Commission with a deep respect for the integrity and abilities of his fellow Commissioners, Committee members, Commission staff, and other interested parties with whom he was associated in the affairs of the Upper Colorado River Commission:

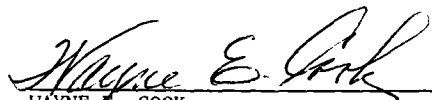
NOW, THEREFORE, BE IT RESOLVED that the Upper Colorado River Commission, at its Adjourned Regular and Adjourned Annual Meetings held in Salt Lake City, Utah on September 20, 1990 does hereby express the gratitude and appreciation of the Commission and its staff for the untiring service and wise counsel rendered for over 10 years by Philip B. Mutz as a member of the Engineering Committee, Alternate Commissioner for the State of New Mexico, and Upper Colorado River Commissioner for the State of New Mexico and that the Upper Colorado River Commission, its advisers and staff sincerely wish him and his family the best of health, happiness, and prosperity in all future endeavors;

BE IT FURTHER RESOLVED that the Executive Director of the Upper Colorado River Commission is hereby directed to send a copy of this Resolution to Mr. and Mrs. Philip B. Mutz and the Governor of the State of New Mexico.

CERTIFICATE

I, WAYNE E. COOK, Executive Director and Secretary of the Upper Colorado River Commission, do hereby certify that the above Resolution was adopted by the Upper Colorado River Commission at its Adjourned Regular and Adjourned Annual Meetings held in Salt Lake City, Utah on September 20, 1990.

WITNESS my hand this 24th day of September, 1990.


WAYNE E. COOK
Executive Director and Secretary

UPPER COLORADO RIVER COMMISSION

**REPORT OF INDEPENDENT ACCOUNTANTS
AND
FINANCIAL STATEMENTS**

June 30, 1990

UPPER COLORADO RIVER COMMISSION

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REPORT OF INDEPENDENT ACCOUNTANTS

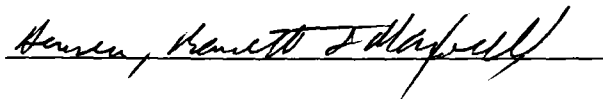
The Commissioners
Upper Colorado River Commission
Salt Lake City, Utah

We have audited the combined balance sheet of the Upper Colorado River Commission as of June 30, 1990, and the related general fund statement of revenues, expenditures and changes in fund balance - budget and actual, for the year then ended. These financial statements are the responsibility of the Commission's management. Our responsibility is to express an opinion on these financial statements based on our audit.

We conducted our audit in accordance with generally accepted auditing standards. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audit provides a reasonable basis for our opinion.

In our opinion, the general purpose financial statements referred to above present fairly, in all material respects, the financial position of the Upper Colorado River Commission, as of June 30, 1990, and the results of its operations for the year then ended in conformity with generally accepted accounting principles.

Our audit was made for the purpose of forming an opinion on the general purpose financial statements taken as a whole. The accompanying information listed in the table of contents is presented for purposes of additional analysis and is not a required part of the general purpose financial statements of the Upper Colorado River Commission. Such information has been subjected to the auditing procedures applied in the audit of the general purpose financial statements and, in our opinion, is fairly stated in all material respects in relation to the general purpose financial statements taken as a whole.



August 28, 1990

**UPPER COLORADO RIVER COMMISSION
COMBINED BALANCE SHEET
JUNE 30, 1990
WITH COMPARATIVE TOTALS FOR JUNE 30, 1989**

ASSETS

| | Governmental Fund Type | Account Groups | | Total Memorandum Only | |
|---|-----------------------------------|---------------------------|---------------------------|----------------------------------|-------------------|
| | | General | General | | |
| | | Fixed Assets | Long-Term Debt | 1990 | 1989 |
| Petty Cash | \$ 25 | \$ - | \$ - | \$ 25 | \$ 25 |
| Cash in bank | 20,430 | - | - | 20,430 | 23,460 |
| Time certificates - Note 4 | 268,271 | - | - | 268,271 | 289,168 |
| Property and equipment: Notes 1 and 2 | | | | | |
| Land and land improvements | - | 26,551 | - | 26,551 | 26,551 |
| Building | - | 56,704 | - | 56,704 | 56,704 |
| Furniture and fixtures | - | 47,875 | - | 47,875 | 47,386 |
| Library | - | 1,366 | - | 1,366 | 1,366 |
| Engineering equipment | - | 1,411 | - | 1,411 | 1,411 |
| Upper Colorado River Basin relief model | - | 5,938 | - | 5,938 | 5,938 |
| Maps | - | 255 | - | 255 | 255 |
| Amount to be provided for payment of compensated absences - Note 1 | - | - | 10,984 | 10,984 | 18,651 |
| Total Assets | \$288,726 | \$140,100 | \$ 10,984 | \$439,810 | \$ 470,915 |

LIABILITIES AND FUND EQUITY

| | | | | | |
|---|------------------|------------------|------------------|------------------|-------------------|
| Liabilities | | | | | |
| Accounts payable | \$ 576 | \$ - | \$ - | \$ 576 | \$ 395 |
| Assessment received in advance | - | - | - | - | 20,812 |
| Obligation for compensated absences - Note 1 | - | - | 10,984 | 10,984 | 18,651 |
| Total Liabilities | 576 | - | 10,984 | 11,560 | 39,858 |
| Fund Equity | | | | | |
| Investment in general fixed assets | - | 140,100 | - | 140,100 | 139,611 |
| Fund balance - Note 5 | 288,150 | - | - | 288,150 | 291,446 |
| Total Fund Equity | 288,150 | 140,100 | - | 428,250 | 431,057 |
| Total Liabilities and Fund Equity | \$288,726 | \$140,100 | \$ 10,984 | \$439,810 | \$ 470,915 |

The accompanying notes are an integral part of these financial statements.

**UPPER COLORADO RIVER COMMISSION
GENERAL FUND
STATEMENT OF REVENUES, EXPENDITURES AND CHANGES IN
FUND BALANCE - BUDGET AND ACTUAL -
FOR THE YEAR ENDED JUNE 30, 1990**

| | <u>Budget</u> | <u>Actual</u> | <u>Favorable (Unfavorable) Variance</u> |
|--|-------------------|-------------------|---|
| Revenues | | | |
| Assessments - Note 1 | \$ 185,000 | \$ 185,000 | \$ - |
| Interest | <u>-</u> | <u>29,663</u> | <u>29,663</u> |
| | <u>185,000</u> | <u>214,663</u> | <u>29,663</u> |
| Expenditures | | | |
| Personal services | 186,400 | 173,577 | 12,823 |
| Travel | 15,000 | 12,445 | 2,555 |
| Current operating expenditures | 38,000 | 31,448 | 6,552 |
| Capital outlay | 5,000 | 489 | 4,511 |
| Consultant fees | 40,000 | - | 40,000 |
| Contingencies | <u>5,000</u> | <u>-</u> | <u>5,000</u> |
| | <u>289,400</u> | <u>217,959</u> | <u>71,441</u> |
| Revenues over (under) expenditures | (104,400) | (3,296) | 101,104 |
| Fund Balance - June 30, 1989 | <u>291,446</u> | <u>291,446</u> | <u>-</u> |
| Fund Balance - June 30, 1990 | <u>\$ 187,046</u> | <u>\$ 288,150</u> | <u>\$ 101,104</u> |

The accompanying notes are an integral part of these financial statements.

**UPPER COLORADO RIVER COMMISSION
NOTES TO FINANCIAL STATEMENTS
JUNE 30, 1990**

NOTE 1—SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

History and Activities

The Upper Colorado River Commission was formed pursuant to the terms of the Upper Colorado River Basin Compact on October 11, 1948, and consented to by the Congress of the United States of America by Act on April 6, 1949, as an administrative agency representing the Upper Division States of the Colorado River Basin, namely Colorado, New Mexico, Utah and Wyoming. The Commission consists of one commissioner representing each of the four states and one representing the United States of America. The activities of the Commission are conducted for the purpose of promoting and securing agricultural and industrial development of the Upper Basin's water resources.

The Commission is the reporting entity and it approves the budget. The Commission hires a director and other administration to operate the day-to-day activities.

The Commission is exempt from Federal income taxes under provisions of Section 501(c)(1) of the Internal Revenue Code. The Commission is also exempt from state income taxes.

Basis of Accounting

The financial statements are presented on the modified accrual basis of accounting. Under the modified accrual basis of accounting, expenditures are recorded at the time liabilities are incurred. Revenues are recognized as received in cash except for revenue susceptible to accrual and revenues of a material amount that have not been received at the normal time of receipt. Revenues susceptible to accrual are those that are both measurable and available to finance the Commission's operations during the year.

Budgets and Budgetary Accounting

Annual budgets are prepared on the modified accrual basis of accounting and adopted as required by law. Certain budgetary information has been modified to conform to financial statement presentation.

Assessments

The Commission's major source of revenue consists of assessments levied against the four states and apportioned among them on the basis of the formula contained in the Upper Colorado River Basin Compact.

Property and Equipment

Property and equipment purchased in an amount greater than \$100 is recorded as capital outlay in the general fund at time of purchase and capitalized at cost in the general fixed assets account group. Cost of maintenance, repairs and minor renewals are expensed as incurred. When assets are retired or otherwise disposed of, the related cost is removed from the accounts. No provision for depreciation is provided on assets in the general fixed assets account group.

NOTE 1--(CONTINUED)

Compensated Absences

According to Commission policy (effective July 1, 1960, as amended), each employee is expected to take annual leave of 15 days each calendar year during which period of time regular salary payments are continued. Employees may accumulate a maximum of 30 days of unused annual leave, which is paid in cash upon termination of employment. The Commission's secretary may grant additional carryover to employees provided that: (1) the employee requests the carryover in writing prior to June 30, and (2) the employee uses the additional carryover within 90 days of the start of the fiscal year.

The Obligation for Compensated Absences has been classified as part of the General Long-Term Debt Account Group because the obligation is not expected to be paid from spendable available resources. The current year reduction was \$7,666.

Total Column on the Combined Statements

The total column on the combined statement is captioned "Memorandum Only" to indicate that it is presented only to facilitate financial analysis. The data in this column does not present financial position in conformity with generally accepted accounting principles. Neither is such data comparable to a consolidation.

NOTE 2--CHANGES IN INVESTMENT IN GENERAL FIXED ASSETS

Changes in the components of general fixed assets are as follows:

| | <u>Fixed Assets</u> <u>July 1, 1989</u> | <u>Additions</u> | <u>Retirements</u> <u>and Disposal</u> | <u>Fixed Assets</u> <u>June 30,1990</u> |
|---|--|------------------|---|--|
| Land and land improvements | \$ 26,551 | \$ - | \$ - | \$ 26,551 |
| Building | 56,704 | - | - | 56,704 |
| Furniture and fixtures | 47,386 | 489 | - | 47,875 |
| Library | 1,366 | - | - | 1,366 |
| Engineering equipment | 1,411 | - | - | 1,411 |
| Upper Colorado River Basin relief model | 5,938 | - | - | 5,938 |
| Maps | <u>255</u> | <u>-</u> | <u>-</u> | <u>255</u> |
| | <u>\$ 139,611</u> | <u>\$ 489</u> | <u>\$ -</u> | <u>\$ 140,100</u> |

NOTE 3--PENSION PLAN

The Commission's employee pension plan is a 401(K) defined contribution plan, and covers all of the present employees. The Commission contributes 7% of the employees' gross salaries. In addition, the Commission will match contributions made by employees up to a maximum of 3%. Accordingly, the maximum allowable contribution by the Commission is 10%. The employees are allowed to contribute a maximum of 5% to the plan. The employer's share of the pension plan contribution for the year ended June 30, 1990 was \$14,434, which includes \$295 of administrative costs.

NOTE 4—TIME CERTIFICATES OF DEPOSIT AND CASH

Time certificates of deposit held at four different banks at June 30, 1990 consist of:

| | <u>Amount</u> | <u>Maturity Date</u> |
|-------------------|------------------|----------------------|
| 8.33% certificate | \$ 92,272 | July 1, 1991 |
| 8.45% certificate | 95,999 | December 26, 1990 |
| 7.4% certificate | 10,000 | July 13, 1990 |
| 7.4% certificate | 10,000 | July 31, 1990 |
| 7.4% certificate | 10,000 | August 15, 1990 |
| 7.4% certificate | 10,000 | August 31, 1990 |
| 7.4% certificate | 10,000 | September 14, 1990 |
| 7.4% certificate | 10,000 | September 28, 1990 |
| 7.4% certificate | 10,000 | October 15, 1990 |
| 7.4% certificate | <u>10,000</u> | October 31, 1990 |
| | <u>\$268,271</u> | |

The Commissioners have authorized the Commission to deposit funds in demand accounts at the First Security Bank of Utah and purchase time certificates of deposit at any United States bank only to the extent the deposits are covered by Federal Depository Insurance.

At year end, the carrying amount of the Commission's cash deposits and certificates was \$288,726 and the balance per the bank statements was \$371,744. All deposits as well as certificates are fully insured.

**UPPER COLORADO RIVER COMMISSION
SCHEDULE OF CASH RECEIPTS AND DISBURSEMENTS - GENERAL FUND
FOR THE YEAR ENDED JUNE 30, 1990**

| | | |
|--------------------------------|---------------|-------------------|
| Cash at July 1, 1989 | | \$ 312,653 |
| Cash receipts: | | |
| Assessments | \$ 164,188 | |
| Interest on time deposits | <u>29,663</u> | <u>193,851</u> |
| | 506,504 | |
| Cash disbursements: | | |
| Personal services | 173,577 | |
| Travel | 12,445 | |
| Current operating expenditures | 31,267 | |
| Capital outlay | <u>489</u> | <u>(217,778)</u> |
| Cash at June 30, 1990 | | <u>\$ 288,726</u> |

**UPPER COLORADO RIVER COMMISSION
EXPENSE SUMMARY SCHEDULES
FOR THE YEAR ENDED JUNE 30, 1990**

| Summary of personal services with budget comparisons | Budget | Actual | Favorable (Unfavorable) Variance |
|---|--------------------------|--------------------------|---|
| Engineering salary | \$ 36,000 | \$ 36,000 | \$ - |
| Administrative salaries | 77,300 | 74,890 | 2,410 |
| Legal salary | 30,500 | 30,500 | - |
| Clerical salaries | 7,000 | - | 7,000 |
| Social security | 11,400 | 10,394 | 1,006 |
| Pension fund contributions | 16,000 | 14,434 | 1,566 |
| Employee medical insurance | 6,200 | 5,799 | 401 |
| Janitorial | <u>2,000</u> | <u>1,560</u> | <u>440</u> |
| | <u>\$ 186,400</u> | <u>\$ 173,577</u> | <u>\$ 12,823</u> |

**Summary of current operating expenditures
with budget total comparison**

| | | |
|---------------------------------------|--------------------------|-------------------------|
| Accounting and auditing | \$ 1,700 | |
| Telephone and telegraph | 4,075 | |
| Insurance | 3,069 | |
| Printing | 2,623 | |
| Office supplies and postage | 9,112 | |
| Library | 5,534 | |
| Meetings, including reporter | 538 | |
| Utilities | 2,777 | |
| Building repair and maintenance | 737 | |
| Memberships and meeting registrations | 1,005 | |
| Miscellaneous | 19 | |
| Education and training | <u>259</u> | |
| | <u>\$ 38,000*</u> | <u>\$ 31,448</u> |
| | | <u>\$ 6,552</u> |

* The budgeted amount for operating expenditures is not broken down into specific expenditures. The total budgeted amount is shown as a comparison against total actual expenditures.

**UPPER COLORADO RIVER COMMISSION
SUMMARY OF INSURANCE COVERAGE
FOR THE YEAR ENDED JUNE 30, 1990**

| <u>Coverage</u> | | |
|---|----------------------------------|--------------------------|
| | <u>Type</u> | <u>Amount</u> |
| Treasurer | Fidelity bond | \$ 40,000 |
| Assistant Treasurer | Fidelity bond | 40,000 |
| Office contents | Fire and comprehensive (B) | |
| On premises | | 150,000 |
| Off premises | | 5,000 |
| Loss of income due to building and personal property damage | | 12 months actual cash |
| loss | | |
| Office premises | Liability (B) | |
| General aggregate limit | | 600,000 |
| Tenant liability limit | | 50,000 |
| Exterior signs | | 500 each occurrence |
| Medical expenses limit (Any one person) | | 5,000 |
| Liability and medical expenses limit | | 300,000 |
| Exterior glass | | replacement cost |
| Building | Special multi-peril (A) & (B) | 277,000 |
| Non-owned automobile | Liability (B) | 300,000 |

(A) This coverage is automatically increased by 4% each quarter of the year as needed to cover actual replacement costs.

(B) The amount of fire and comprehensive, liability, and special multi-peril coverages are subject to a \$250 deductible clause.

APPENDIX B

BUDGET

FISCAL YEAR ENDING JUNE 30, 1991

BUDGET

UPPER COLORADO RIVER COMMISSION
Fiscal Year ending June 30, 1992

(As revised December 5, 1990)

PERSONAL SERVICES

| | | |
|--------------------------|--------------|-----------|
| Administrative Salaries | | |
| Executive Director | \$ 70,400 | |
| Administrative Secretary | 18,100 | |
| Professional Services | | |
| Chief Engineer | 37,800 | |
| Legal Counsel | 37,400 | |
| Janitor | 2,800 | |
| Pension Trust | 16,500 | |
| Social Security | 12,600 | |
| Health Insurance | <u>5,200</u> | |
| | | \$200,800 |

TRAVEL \$ 16,000

CURRENT EXPENSES \$ 35,000

CAPITAL OUTLAY \$ 6,000

CONSULTANT FEES \$ 20,000

CONTINGENCIES \$ 5,000

\$282,800

TOTAL BUDGETED EXPENSES

| | |
|-------------------------------|------------------|
| To be funded from surplus | \$ 78,800 |
| Total Assessments for FY 1992 | <u>204,000</u> |
| | <u>\$282,800</u> |

ASSESSMENTS 1992

| | | |
|------------|--------|---------------|
| Colorado | 51.75% | \$105,570 |
| New Mexico | 11.25% | 22,950 |
| Utah | 23.00% | 46,920 |
| Wyoming | 14.00% | <u>28,560</u> |
| | | \$204,000 |

APPENDIX C
TRANSMOUNTAIN DIVERSIONS
UPPER COLORADO RIVER BASIN
1981-1990

TRANSMOUNTAIN DIVERSIONS FROM
COLORADO RIVER BASIN IN COLORADO
1981-1990

| | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 ¹ | AVERAGE (10 YEAR) |
|---------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|-------------------|----------------------|
| TO PLATTE RIVER BASIN | | | | | | | | | | | |
| Grand River Ditch | 13,700 | 21,860 | 21,670 | 17,620 | 20,830 | 24,481 | 17,640 | 19,050 | 18,830 | 20,980 | 19,666 |
| Eureka Ditch | 0 | 0 | 0 | 36 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| Alva B. Adams Tunnel | 252,800 | 248,500 | 165,800 | 195,500 | 285,200 | 273,800 | 246,200 | 258,000 | 273,200 | 213,700 | 241,270 |
| Berthoud Pass Ditch | 463 | 426 | 674 | 1,120 | 567 | 911 | 271 | 710 | 843 | 623 | 661 |
| Moffat Water Tunnel | 53,920 | 87,840 | 36,510 | 50,150 | 77,540 | 80,720 | 50,130 | 75,530 | 66,530 | 67,390 | 64,626 |
| Vidler Tunnel | 800 | 586 | 396 | 704 | 369 | 493 | 396 | 758 | 975 | 660 | 614 |
| Harold D. Roberts Tunnel | 110,200 | 68,010 | 8,000 | 0 | 299 | 980 | 14,640 | 53,060 | 74,380 | 59,420 | 38,899 |
| August P. Gumlick Tunnel | 9,970 | 8,680 | 2,740 | 2,840 | 6,480 | 7,460 | 3,850 | 5,150 | 9,050 | 9,048 | 6,527 |
| TO ARKANSAS RIVER BASIN | | | | | | | | | | | |
| Hoosier Pass Tunnel | 5,650 | 10,590 | 6,160 | 7,490 | 7,470 | 11,940 | 8,830 | 9,680 | 10,720 | 11,200 | 8,973 |
| Columbine Ditch | 921 | 1,910 | 2,460 | 3,100 | 1,810 | 1,920 | 1,210 | 1,050 | 1,420 | 746 | 1,655 |
| Ewing Ditch | 428 | 1,120 | 1,910 | 2,580 | 1,360 | 1,070 | 813 | 1,030 | 786 | 785 | 1,188 |
| Wurtz Ditch | 851 | 3,760 | 3,710 | 2,730 | 3,830 | 3,860 | 2,200 | 881 | 2,070 | 1,702 | 2,861 |
| Homestake Tunnel | 21,290 | 19,720 | 22,740 | 27,920 | 10,180 | 16,930 | 18,540 | 28,690 | 26,840 | 27,480 | 25,033 |
| Twin Lakes Tunnel | 34,330 | 54,010 | 60,450 | 8,790 | 15,800 | 50,600 | 18,110 | 32,420 | 37,410 | 41,368 | 35,329 |
| Charles H. Boustead Tunnel | 34,180 | 75,490 | 87,510 | 107,600 | 71,800 | 31,750 | 3,340 | 14,280 | 37,240 | 47,270 | 51,046 |
| Busk-Ivanhoe Tunnel | 4,560 | 6,840 | 9,380 | 9,760 | 6,270 | 5,510 | 3,600 | 4,270 | 3,760 | 5,170 | 5,912 |
| Larkspur Ditch | 127 | 120 | 338 | 407 | 329 | 220 | 77 | 60 | 30 | 8 | 172 |
| TO RIO GRANDE BASIN | | | | | | | | | | | |
| Tarbell Ditch | 291 | 735 | 0 | 283 | 172 | 0 | 55 | 195 | 344 | 79 | 215 |
| Tabor Ditch | 671 | 1,600 | 1,250 | 1,190 | 1,440 | 1,330 | 1,310 | 384 | 487 | 627 | 1,029 |
| Treasure Pass Ditch | 233 | 390 | 450 | 305 | 613 | 411 | 0 | 223 | 163 | 53 | 284 |
| Don La Font Ditches No. 1 & 2 | 215 | 210 | 0 | 66 | 447 | 13 | 361 | 754 | 339 | 138 | 254 |
| William Creek-Squaw Pass Ditch | 0 | 134 | 149 | 282 | 253 | 242 | 530 | 232 | 238 | 205 | 227 |
| Pine River-Weminuche Pass Ditch | 361 | 629 | 804 | 971 | 873 | 961 | 575 | 866 | 508 | 451 | 700 |
| Weminuche Pass Ditch | 1,980 | 1,590 | 2,020 | 2,110 | 2,090 | 3,150 | 16 | 419 | 878 | 960 | 1,521 |
| TOTAL | 547,941 | 614,770 | 435,121 | 446,554 | 516,022 | 518,752 | 392,694 | 507,692 | 567,041 | 510,063 | 505,665 |

TRANSMOUNTAIN DIVERSIONS FROM COLORADO RIVER BASIN
IN COLORADO TO RIO GRANDE BASIN IN NEW MEXICO
1981-1990

| | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 ¹ | AVERAGE (10 YEAR) |
|---------------------------|--------|---------|---------|---------|--------|--------|--------|--------|--------|-------------------|----------------------|
| San Juan-Chama Diversions | 53,960 | 127,100 | 130,310 | 113,630 | 91,790 | 89,180 | 83,050 | 63,590 | 51,416 | 71,710 | 87,574 |

TRANSMOUNTAIN DIVERSIONS FROM
COLORADO RIVER BASIN IN UTAH²
1981-1990

| | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 ¹ | AVERAGE (10 YEAR) |
|--------------------------------|---------|--------|--------|--------|--------|--------|---------|---------|---------|-------------------|----------------------|
| TO GREAT BASIN | | | | | | | | | | | |
| Fairview Tunnel | 2,030 | 3,050 | 2,226 | 3,057 | 2,760 | 3,194 | 2,260 | 1,124 | 1,988 | 2,555 | 2,424 |
| Ephraim Tunnel | 3,468 | 6,288 | 1,287 | 1,210 | 563 | 1,625 | 901 | 549 | 533 | 2,682 | 1,911 |
| Spring City Tunnel | 1,574 | 3,623 | 1,867 | 2,260 | 2,270 | 1,869 | 1,490 | 683 | 844 | 2,033 | 1,851 |
| Strawberry Tunnel | 74,592 | 46,926 | 9,327 | 15,982 | 52,690 | 48,441 | 83,192 | 89,138 | 88,797 | 82,006 | 59,103 |
| Hobble Creek Ditch | 603 | 1,244 | 558 | 103 | 146 | 240 | 629 | 633 | 427 | 510 | 509 |
| Strawberry-Willow Creek Ditch | 1,145 | 1,302 | 1,230 | 1,159 | 158 | 1,412 | 739 | 743 | 1,113 | 1,773 | 1,077 |
| Strawberry Tunnel-Deer Ck. Ex. | | | | | | | | | 26,562 | 33,225 | 29,894 |
| Duchesne Tunnel | 17,295 | 13,159 | 969 | 0 | 1,063 | 11,094 | 23,239 | 25,025 | 25,609 | 29,125 | 14,658 |
| TOTAL | 100,677 | 75,592 | 17,464 | 23,741 | 59,650 | 67,875 | 112,450 | 117,895 | 145,873 | 153,909 | 111,427 |

TRANSMOUNTAIN DIVERSIONS FROM GREAT BASIN
IN UTAH TO COLORADO RIVER BASIN IN UTAH
1981-1990

| | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 ¹ | AVERAGE (10 YEAR) |
|----------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------------------|----------------------|
| Tropic and East Fork Canal | 5,717 | 5,982 | 5,137 | 6,083 | 6,148 | 5,724 | 6,155 | 6,145 | 3,717 | 3,332 | 5,414 |

TRANSMOUNTAIN DIVERSIONS FROM COLORADO RIVER
BASIN TO NORTH PLATTE BASIN IN WYOMING³
1981-1990

| | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 ¹ | AVERAGE (10 YEAR) |
|--|-------|-------|-------|-------|-------|--------|-------|-------|--------|-------------------|----------------------|
| | 5,451 | 9,581 | 5,027 | 2,482 | 9,807 | 12,107 | 8,379 | 7,044 | 12,489 | 13,894 | 8,626 |

TRANSMOUNTAIN DIVERSIONS FROM
COLORADO RIVER BASIN⁴
1981-1990

| | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 ¹ | AVERAGE (10 YEAR) |
|--|---------|---------|---------|---------|---------|---------|---------|---------|---------|-------------------|----------------------|
| | 702,312 | 821,061 | 582,785 | 580,324 | 671,121 | 682,190 | 590,418 | 690,076 | 773,102 | 746,244 | 683,963 |

¹Based on preliminary streamflow records obtained from U. S. Bureau of Reclamation, U. S. Geological Survey, Central Utah Water Conservancy District, Colorado Division of Water Resources, New Mexico Interstate Stream Commission, and Wyoming State Engineer's Office--subject to revision.
²Streamgaging of the following small transmountain diversions in Utah was discontinued in 1959 but the flow is estimated to be as follows:
Tunnel - 220 acre-feet, Horseshoe Tunnel - 600 acre-feet, Larsen Tunnel - 690 acre-feet, Coal Fork Ditch - 260 acre-feet, Twin Creek 40 acre-feet, and John August Ditch - 200 acre-feet. These diversions are from the San Rafael River in the Colorado River to the Great Basin in Utah and total about 3,100 acre-feet annually.

³Does not include diversions for Enlargement Continental Divide Ditch which services 473 acres of Ranger Ditch which services 391 acres. Neither ditch is gaged, and suitable estimates of diversion amounts are currently unavailable.

⁴The total diversion is the sum of all diversions except Tropic and East Ford Canal which imports water to the Colorado River Basin. This import is subtracted from the sum of the exports.