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# **EIGHTH ANNUAL REPORT**

**OF THE**

# **UPPER COLORADO RIVER COMMISSION**

**TO THE**

**PRESIDENT  
OF THE UNITED STATES**

**AND THE**

**GOVERNORS  
OF THE UPPER COLORADO  
RIVER BASIN STATES**



**FOR THE PERIOD**

**APRIL 1, 1956 to MARCH 7, 1957**

**EIGHTH ANNUAL REPORT**  
**OF THE**  
**UPPER COLORADO**  
**RIVER COMMISSION**

**TO THE**  
**PRESIDENT**  
**OF THE UNITED STATES**

**AND THE**  
**GOVERNORS**  
**OF THE UPPER COLORADO**  
**RIVER BASIN STATES**



**FOR THE PERIOD**  
**APRIL 1, 1956 to MARCH 7, 1957**

**IVAL V. GOSLIN**  
**ENGINEER - SECRETARY**



# UPPER COLORADO RIVER BASIN

## COLORADO RIVER STORAGE PROJECT AND PARTICIPATING PROJECTS

UPPER COLORADO RIVER COMMISSION

Public Law 485, 84th Congress



UPPER COLORADO RIVER COMMISSION  
748 North Avenue  
Grand Junction, Colorado

March 10, 1957

Mr. President:

A copy of the Eighth 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 is attached as Appendix A.

Respectfully yours,

|s| Ival V. Goslin

Ival V. Goslin  
Engineer-Secretary

The President  
The White House  
Washington 25, D. C.

Enclosure

dd



UPPER COLORADO RIVER COMMISSION  
748 North Avenue  
Grand Junction, Colorado

March 10, 1957

Dear Governor McFarland:

In accordance with Article VIII(d) (13) of the Upper Colorado River Basin Compact, we are pleased to submit the Eighth Annual Report of the Upper Colorado River Commission.

The budget of the Commission is attached as Appendix A.

Sincerely yours,

|s| Ival V. Goslin

Ival V. Goslin  
Engineer-Secretary

Honorable Ernest W. McFarland  
Governor, State of Arizona  
Capitol Building  
Phoenix, Arizona

Enclosure

IVG:dd

UPPER COLORADO RIVER COMMISSION  
748 North Avenue  
Grand Junction, Colorado

March 10, 1957

Dear Governor McNichols:

In accordance with Article VIII(d) (13) of the Upper Colorado River Basin Compact, we are pleased to submit the Eighth Annual Report of the Upper Colorado River Commission.

The budget of the Commission is attached as Appendix A.

Sincerely yours,

|s| Ival V. Goslin

Ival V. Goslin  
Engineer-Secretary

Honorable Stephen L. R. McNichols  
Governor, State of Colorado  
Capitol Building  
Denver, Colorado

Enclosure

IVG:dd



UPPER COLORADO RIVER COMMISSION  
748 North Avenue  
Grand Junction, Colorado

March 10, 1957

Dear Governor Mechem:

In accordance with Article VIII(d) (13) of the Upper Colorado River Basin Compact, we are pleased to submit the Eighth Annual Report of the Upper Colorado River Commission.

The budget of the Commission is attached as Appendix A.

Sincerely yours,

|s| Ival V. Goslin

Ival V. Goslin  
Engineer-Secretary

Honorable Edwin L. Mechem  
Governor, State of New Mexico  
Capitol Building  
Santa Fe, New Mexico

Enclosure

IVG:dd

UPPER COLORADO RIVER COMMISSION  
748 North Avenue  
Grand Junction, Colorado

March 10, 1957

Dear Governor Clyde:

In accordance with Article VIII(d) (13) of the Upper Colorado River Basin Compact, we are pleased to submit the Eighth Annual Report of the Upper Colorado River Commission.

The budget of the Commission is attached as Appendix A.

Sincerely yours,

|s| Ival V. Goslin

Ival V. Goslin  
Engineer-Secretary

Honorable George D. Clyde  
Governor, State of Utah  
Capitol Building  
Salt Lake City, Utah

Enclosure

IVG:dd



UPPER COLORADO RIVER COMMISSION  
748 North Avenue  
Grand Junction, Colorado

March 10, 1957

Dear Governor Simpson:

In accordance with Article VIII(d) (13) of the Upper Colorado River Basin Compact, we are pleased to submit the Eighth Annual Report of the Upper Colorado River Commission.

The budget of the Commission is attached as Appendix A.

Sincerely yours,

|s| Ival V. Goslin

Ival V. Goslin  
Engineer-Secretary

Honorable Milward L. Simpson  
Governor, State of Wyoming  
Capitol Building  
Cheyenne, Wyoming

Enclosure

IVG:dd

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**EIGHTH ANNUAL REPORT**  
**UPPER COLORADO RIVER COMMISSION**  
March 7, 1957

***I. INTRODUCTION - SUMMARY***

This Annual Report covers the activities of the Commission for the preceding year. It 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;

An outline-analysis of Public Law 485, 84th Congress, which authorized the construction of the Colorado River Storage Project and participating projects;

A copy of Public Law 485, 84th Congress, 2d Session;

Reprint of an article on Upper Colorado Project Financing: Repayment Plan for Multipurpose Reservoirs;

Brief descriptions of the Storage Units and participating projects and of the status of their construction or investigations;

A statement issued by Governors of the four Upper Division States;

Brief discussion of the Small Reclamation Projects Act of 1956;

Appendices containing:

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



List of construction contract awards for Units of the Colorado River Storage Project;

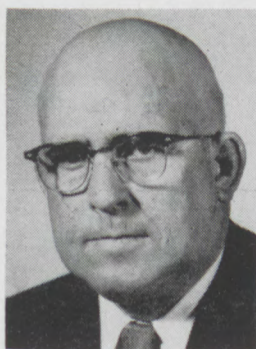
List of gaging stations used by the Commission and transmountain diversions from the Upper Colorado River Basin.

For information pertaining to the activities of the Upper Colorado River Commission prior to March 31, 1956, the reader is referred to the Commission's Seventh Annual Report of April 1, 1956. In order that a more nearly recent account of the Commission's activities may be gained, this report includes the period to March 7, 1957.





## *II. COMMISSION*



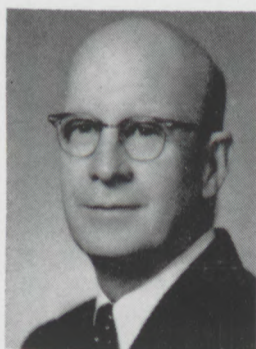
**George D. Clyde**  
Vice-Chairman  
Commissioner for  
Utah



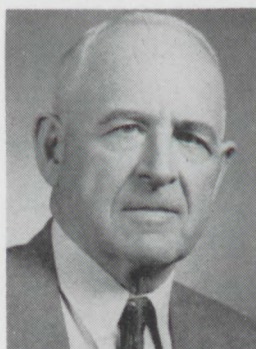
**L. C. Bishop**  
Commissioner for  
Wyoming



**Robert J. Newell**  
Chairman  
Commissioner for  
United States



**John H. Bliss**  
Commissioner for  
New Mexico



**Frank Delaney**  
Commissioner for  
Colorado

### **III. COMMITTEES**

The Committees of the Commission convened when required during the year.

Committees and their membership, at the time of writing this report, are as follows (the Chairman and the Secretary are ex-officio members of all committees, Article V(4) of By-Laws):

#### **STANDING COMMITTEES**

##### **Engineering Committee**

J. R. Riter, Chairman	David P. Hale
John H. Bliss	H. T. Person
Royce J. Tipton	Paul A. Rechar
Frank C. Merriell	George D. Clyde
Ivan C. Crawford	Earl Lloyd
Jay R. Bingham	G. B. Keesee

##### **Legal Committee**

Fred E. Wilson, Chairman	Laurence Davis
E. R. Callister, Jr.	Hatfield Chilson
J. Stuart McMaster	George F. Guy

##### **Budget Committee**

John H. Bliss, Chairman	J. R. Riter
Ivan C. Crawford	Norman W. Barlow
Jay R. Bingham	

#### **SPECIAL COMMITTEES**

##### **Finance Committee**

Norman W. Barlow, Chairman	George D. Clyde
I. J. Coury	Dan Hunter

##### **Committee on Criteria for Congressional Evaluation of Water-use Projects, Senate Resolution 281, 84th Congress**

John H. Bliss, Chairman	Howard Black
Ivan C. Crawford	E. R. Callister, Jr.



## ***IV. ADVISERS TO COMMISSIONERS***

The following individuals contributed greatly of their time and efforts as advisers to their respective Commissioners:

### **UNITED STATES OF AMERICA**

#### **Legal**

J. Stuart McMaster, Field Solicitor  
U. S. Department of the Interior  
Salt Lake City, Utah

Laurence Davis, Assistant General Counsel  
The Navajo Tribe  
Window Rock, Arizona

James D. Geissinger, Regional Solicitor  
U. S. Department of the Interior  
Denver, Colorado

#### **Engineering**

J. R. Riter, Chief Development Engineer  
Bureau of Reclamation  
Denver, Colorado

G. B. Keesee, Area Irrigation Engineer  
Bureau of Indian Affairs  
Gallup, New Mexico

### **COLORADO**

#### **Legal**

Hatfield Chilson, Legal Counsel  
Colorado Water Conservation Board  
Loveland, Colorado

#### **Engineering**

Royce J. Tipton, Consultant  
Colorado Water Conservation Board  
Denver, Colorado



Ivan C. Crawford, Director  
Colorado Water Conservation Board  
Denver, Colorado

Frank C. Merriell, Consulting Engineer  
Grand Junction, Colorado

## NEW MEXICO

### Legal

Fred E. Wilson, Attorney-at-Law  
Albuquerque, New Mexico

### Engineering

Stephen E. Reynolds, State Engineer  
Santa Fe, New Mexico

David P. Hale, Assistant Engineer  
New Mexico Interstate Stream Commission  
Santa Fe, New Mexico

## UTAH

### Legal

E. R. Callister, Jr., Attorney General  
Salt Lake City, Utah

### Engineering

Jay R. Bingham, Director  
Utah Water and Power Board  
Salt Lake City, Utah

## WYOMING

### Legal

George F. Guy, Attorney General  
Cheyenne, Wyoming

Howard Black, Deputy Attorney General  
Cheyenne, Wyoming

## **Engineering**

Earl Lloyd, Deputy State Engineer  
Cheyenne, Wyoming

H. T. Person, Dean of School of Engineering  
University of Wyoming  
Laramie, Wyoming

Paul A. Rechard, Chief of Water Development  
Wyoming Natural Resource Board  
Cheyenne, Wyoming

## **Alternates in absence of Commissioner**

Joe L. Budd  
Big Piney, Wyoming

Norman W. Barlow  
Cora, Wyoming



## V. STAFF

Members of the staff of the Upper Colorado River Commission, at the time of compiling this report, are:

Ival V. Goslin, Engineer-Secretary

Mrs. Dorothy Dye, Administrative Assistant

Mrs. Dixie S. Duncan, Clerk-Stenographer

Barney L. Whatley, Treasurer

Richard T. Counley, Assistant Treasurer

R. D. Goodrich, Engineering Consultant (part time)

Mrs. Lois P. Crowder, Official Reporter





## VI. MEETINGS OF THE COMMISSION

During the period March 20, 1956 to March 7, 1957, the Commission met five times as follows:

Meeting No. 47	April 30, 1956	Adjourned Regular Meeting Farmington, New Mexico
Meeting No. 48	June 12, 1956	Special Meeting Salt Lake City, Utah
Meeting No. 49	September 17, 1956	Annual Meeting Grand Junction, Colorado
Meeting No. 50	October 2, 1956	Adjourned Annual Meeting Rock Springs, Wyoming
Meeting No. 51	February 28, 1957	Special Meeting Salt Lake City, Utah



## **VII. 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 have consisted of: (A) a public relations and information program designed to aid in securing appropriations of funds by the U. S. Congress for the construction of the Colorado River Storage Project and participating projects which have been authorized for construction (P. L. 485, 84th Congress); and, (B) a modified program of hydrologic research on methods for applying the Inflow-Outflow Theory of measuring stream depletions in the Upper Colorado River Basin.

### **A. PUBLIC RELATIONS - INFORMATION**

The Upper Colorado River Commission has directed its efforts 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 towards 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 in Public Law 485, as well as funds for the investigations of additional participating projects that are given priority in planning in the authorizing Act.



President Eisenhower, in his Budget Message to the 2d Session of the 84th Congress in January 1956, recommended an appropriation of \$8,000,000 for the Colorado River Storage Project when the authorizing legislation was approved by Congress.

Immediately after the President approved the Act on April 11, 1956, Members of Congress went to work in an effort to get an appropriation of funds to initiate project construction. After hearings held before the Public Works Subcommittee, the House Appropriations Committee recommended \$3,155,000 for the Colorado River Storage Project. When this recommendation reached the floor of the House, the House agreed to an amendment which boosted the total to \$6,000,000. The Senate Committee on Appropriations recommended \$13,000,000 as an initial appropriation. After a conference between the House and Senate Committee Members, the appropriation was finally fixed at \$13,000,000 for the 1957 fiscal year, of which \$1,300,000 were earmarked for construction of Flaming Gorge Dam and Reservoir, \$9,325,000 for Glen Canyon Dam and Reservoir, and \$800,000 for Navajo Dam, with the participating projects receiving \$1,575,000.

The Commission published a well-illustrated brochure entitled "*The Colorado River Storage Project*" and a pamphlet on the same subject, both of which have been widely distributed throughout the United States. Both of these publications are based upon Public Law 485, and explain the major features which are to be constructed in the initial phase of the Upper Colorado River development.

The Relief Model of the Upper Colorado River Basin, which was constructed by the Commission with the permission of and in cooperation with the Babson Institute of Business Administration at Babson Park, Massachusetts, has been prominently displayed at such places as the Uintah Basin Industrial Convention at Roosevelt, Utah; the Conference of the Utah Committee on Industrial and Employment Planning at Salt Lake City, Utah; in the State Capitol at Salt Lake City, Utah; at the National Reclamation Association Convention at Salt Lake City, Utah; and in the State Capitol at Cheyenne, Wyoming.

The Commission's film, "*A Project for People*", which describes the Colorado River Storage Project and portrays the benefits to be derived from the development of water, power and other natural resources, has been loaned for showings to civic organizations and other interested parties from coast to coast.



The Commission has continued to be active in urging the Department of the Interior and Bureau of Reclamation to continue investigations of additional participating projects in order that further project authorizations may be sought at an early date.

The Upper Colorado River Commission is following the policy of cooperation with representatives of water organizations in all parts of the nation who are interested in natural resources development. Hundreds of letters of inquiry about basin-wide development of resources of the Upper Basin, as contemplated by the Colorado River Storage Project and participating projects, have been answered during the past year.

At the request of the Senate Committees on Interior and Insular Affairs, and Public Works, the Upper Colorado River Commission, through a special committee, submitted comments and recommendations on S. Res. 281, 84th Congress. This resolution pertains to the establishing of criteria for the evaluation by the Congress of water-use projects presented to Congress for approval. These comments are printed in a Committee Print dated January 4, 1957, entitled, *"Conservation and Development of Water Resources, Memorandum of the Chairmen to Members of the Senate Committees on Interior and Insular Affairs, and Public Works in Connection with S. Res. 281 of the 84th Congress"*.

### Acknowledgments

The Commission acknowledges with appreciation the assistance it has received from agencies of the Executive Branch of the Federal Government, the Department of the Interior, the Bureau of Reclamation, the Office of Indian Affairs and the U. S. Geological Survey.

The Commission especially wishes to recognize the difficult and able work done by the Members of the Senate and House of Representatives of the Congress from the five Upper Colorado River Basin States who have devoted so much of their time and effort to the development of the water resources of the Upper Basin.

## B. HYDROLOGY — INFLOW-OUTFLOW STUDIES

The engineering work of the Commission during the past year has been considerably curtailed under that for previous years, most of the technical work having been accomplished by one engineer working on a half-time basis. The greatest portion of the work has been in connection with studies of the Inflow-Outflow Method of measuring stream depletions. Although the Engineering Committee met once during the year, there have been no additional engineering reports since Engineering Report No. 23, dated March 1, 1956, which consisted of a review and record of the Inflow-Outflow studies made prior to that time.

Limited investigations have been made into the relationship of stream flow to consumptive use.

The Commission has authorized a complete census of the irrigated acreages in the Upper Colorado River Basin and within each State of the Upper Basin. It has also authorized an enlargement of its technical engineering staff. As soon as it is possible to obtain the needed personnel, investigations of irrigated acreages and intensified research into the Inflow-Outflow Theory of measuring stream depletions will be commenced. Calculations of virgin flows based upon estimates of man-made depletions are dependent upon accurate estimates of irrigated acreages.

The engineering staff of the Commission is continuing its job of collecting, assembling and analyzing all hydrographic records pertaining to the Colorado River Basin.

Numerous project reports on water-development projects, compiled by various Federal agencies, have been analyzed.

### Forecasts of Stream Flow

Forecasts of water supply have not been made by the Engineering Department, nor have any findings of fact pertaining to water deliveries or stream depletions been made. Forecasts of stream flow made by various other agencies are to be found in the files of the Commission.



## *VIII. Colorado River Storage Project and Participating Projects*

On April 11, 1956 legislation authorizing construction of the Colorado River Storage Project and participating projects was signed into law by President Eisenhower (Public Law 485, 84th Congress).

This action, culminating years of research and study, makes possible the industrial and agricultural development of a vast area of America in the States of Wyoming, Utah, New Mexico, Colorado, and Arizona. The initial authorization provides for the expenditure of funds not exceeding \$760 million.

The Second Session of the 84th Congress appropriated \$13,000,000 for a start of construction of the various features of the water-development plan.

On October 15, 1956, heralded by nationally publicized ceremonies, President Eisenhower pushed a button in the Cabinet Room of the White House in Washington, D. C., detonating dynamite blasts at Glen Canyon of the Colorado River and Flaming Gorge of the Green River, which signalled the official commencement of construction activities. See page 15.





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Currently the 85th Congress is being asked to appropriate additional funds in order that construction can continue. The Bureau of the Budget, through the President's budget message to Congress on January 16, 1957, recommended an appropriation to the Upper Colorado River Basin Fund of \$25,142,000 for the 1958 fiscal year. Of this sum, \$1,195,037 are earmarked for advance planning of participating projects, \$100,000 for investigations and preliminary construction of transmission lines, and the following sums for construction of Storage Units: Glen Canyon, \$15,602,000; Flaming Gorge, \$3,700,000; Navajo, \$1,530,000. Allocated to obligations for stores, camps, etc., to be costed in future years, are \$3,554,963. It is expected that there will be \$540,000 from contributions. The Bureau of the Budget did not recommend the appropriation of funds for the initiation of construction of any participating projects in fiscal year 1958. It is hoped that Congress will remedy this situation in order that the construction of irrigation facilities can proceed as expeditiously as possible.

Appendix C of this report consists of a tabulation of construction contract awards made by the U. S. Bureau of Reclamation for Units of the Colorado River Storage Project, and a list of construction contracts scheduled for bidding during the period February-April, 1957.

### **A. Provisions of Public Law 485, 84th Congress, 2d Session**

In the Seventh Annual Report a section is devoted to legislation to authorize the Colorado River Storage Project and participating projects. That report also contains a summary of events in the legislative history of Public Law 485. The following outline-analysis of this Act may be of benefit to those who wish to refer to it:



Outline Analysis  
PUBLIC LAW 485 — 84th Congress  
Chapter 203 — 2d Session  
S. 500

AN ACT

To authorize the Secretary of the Interior to construct, operate, and maintain the Colorado River Storage Project and participating projects, and for other purposes.

**Section 1 —**

(i) Authorizes Secretary of Interior to construct, operate, and maintain dams, reservoirs, power plants, transmission facilities and appurtenant works at:

Curecanti  
Flaming Gorge  
Navajo  
Glen Canyon

Curecanti cannot be constructed until Secretary can certify to President and Congress that it can be economically justified.

(ii) Authorizes Secretary to construct, operate, and maintain 11 participating projects:

Utah	Colorado	New Mexico	Wyoming
Central Utah	Florida	Hammond	La Barge
Emery County	Paonia		Lyman
	Pine River		Seedskaadee
	Extension		
	Silt		
	Smith Fork		

(iii) Directs Secretary to protect Rainbow Bridge National Monument when constructing Glen Canyon Dam and Reservoir.



## Section 2 —

(i) Directs Secretary to give priority to completion of planning reports for 24 participating projects:

Utah	New Mexico	Wyoming
Gooseberry	San Juan-Chama	Sublette
	Navajo	

### Colorado

Parshall	Ohio Creek
Troublesome	Fruitland Mesa
Rabbit Ear	Bostwick Park
Eagle Divide	Grand Mesa
San Miguel	Dallas Creek
West Divide	Savery-Pot Hook
Bluestone	Dolores
Battlement Mesa	Fruit Growers Extension
Tomichi Creek	Animas-LaPlata
East River	Yellow Jacket

(ii) Reports on the above projects are to be completed as rapidly as funds are made available and are to be submitted to the affected States, including Texas, with respect to the San Juan-Chama Project.

(iii) Priority is also given to completion of a planning report on the Juniper Project. It is not specified whether it shall be a Storage Unit or a participating project.

## Section 3 —

(i) States that it is not the intention of Congress to prevent water resource developments in the Upper Basin in addition to the projects authorized in Section 1 or the projects given priority for planning reports in Section 2.

(ii) States that it is the intention of Congress that no dam or reservoir is to be constructed within any national park or monument.

#### Section 4 —

(i) Directs Secretary to be governed by Federal reclamation laws in construction, operation, and maintenance.

(ii) Provides (a) irrigation repayment contracts (except for Eden and Paonia) shall be for 50-year periods exclusive of development period.

(iii) Provides (b) that, prior to construction of irrigation distribution facilities, contracts shall be made with conservancy-district type organizations except where a substantial proportion of lands are owned by the United States.

(iv) Provides (c) that contracts relating to municipal water supply may be made without regard to the limitation that the efficiency of the project for irrigation purposes will not be impaired.

(v) Provides (d) that costs of Indian lands served by a participating project that are within the capability of the land to repay shall be deferred so long as the land remains in Indian ownership.

(vi) Provides that for 10 years from enactment of P. L. 485 no water from any participating project shall be delivered to newly irrigated lands producing basic agricultural commodities that are in surplus.

(vii) Provides that all Storage Units and participating projects shall be subject to the apportionments of use of water as defined in documents making up the law of the river.

#### Section 5 —

(i) Creates (a) the Upper Colorado River Basin Fund.

(ii) Specifies (b) that all appropriations shall be credited to the Basin Fund as advances from the general fund of the Treasury (except for non-reimbursable recreation funds of Section 8).

(iii) Specifies (c) that all revenues collected from irrigation, power, municipal water or other sources shall be credited to the Basin Fund and shall be available without further appropriation for paying:



- (1) operation, maintenance, replacement, and emergencies: provided that **each** participating project must pay these costs from its own revenues.

(iv) Provides (2) for payment of power, municipal water and interest cost under 5(d)

----- (d) (1) power costs to be paid within 50 years;

(d) (2) municipal water costs to be paid within 50 years;

(d) (3) interest (including interest during construction) on unamortized balance of investment in power and municipal water features;

(d) (4) costs of each Storage Unit allocated to irrigation to be paid within 50 years.

(v) Provides that revenues credited to Basin Fund cannot be used for construction of Units and participating projects authorized by P. L. 485.

(vi) Provides (3) for division of power revenue credits and payment of costs of power, municipal water and interest on power and municipal water investments of participating projects under 5(e).

(e) Provides:

- (i) Revenues in Basin Fund in excess of amounts needed to defray O M & R and emergencies (c) (1) and costs of power (d) (1), municipal water (d) (2), interest on investments in power and municipal water features (d) (3), and costs of Storage Units allocated to irrigation (d) (4) are apportioned among the States as follows: Colorado, 46% ; Utah, 21.5% ; Wyoming, 15.5% ; and New Mexico, 17% : Provided, that if a participating project has power and/or municipal water features it must pay from its own revenues its own power costs (d) (1) and/or its own municipal water costs (d) (2) and interest on power and/or municipal water investments



(d) (3) and if there are excess revenues remaining in the Basin Fund to the credit of a participating project after these costs (power, municipal water, interest) are paid, the State wherein the participating project is located gets credit for these excess revenues from power and municipal water before the above percentages are applied to the balance in the Basin Fund.

(ii) Revenues apportioned to each State may be used for repaying costs of participating projects only in that State, and may not be used in another State unless appropriate consent is given.

(iii) Annually from the revenues apportioned to each State there shall be paid

(1) costs of participating projects authorized (except Paonia) which are allocated to irrigation within 50 years;

(2) costs of Paonia Project within 68 years;

(3) costs of Eden Project within 60 years.

(iv) Provides (f) for method of figuring interest rate applicable for each year an advance is made from the Federal Treasury on basis of interest paid on certain long-term obligations of the Federal Government.

(v) Provides (g) for business-type budgets to be submitted annually to Congress.

## Section 6 —

(i) Directs Secretary to allocate total costs (excluding costs of recreational features) of each Unit or project to power, irrigation, municipal water supply, flood control or other purposes authorized under reclamation law.

(ii) Provides that construction and O & M costs allocated to nonreimbursable purposes are nonreturnable.

(iii) Specifies that irrigation costs of the Navajo participating project that are beyond the capability of the land to repay shall be nonreimbursable.

(iv) Requires Secretary on January 1 of each year to make a financial report to Congress on the activities of the previous year.

#### Section 7 —

(i) Provides that power plants and transmission lines shall be operated by the Secretary in conjunction with other Federal installations so as to produce as much firm power as possible.

(ii) Provides that in the operation of the power plants and transmission lines the Secretary shall not affect or interfere with certain Compacts, Acts, and contracts.

(iii) Specifies that the use of water for power generation shall not preclude or impair the appropriation of water for domestic or agricultural purposes under State law.

#### Section 8 —

(i) Provides for the planning, constructing, and operating of public recreational facilities.

(ii) Provides for the planning, constructing, and operating of facilities to protect and propagate fish and wildlife.

(iii) Authorizes Secretary to acquire lands and withdraw lands for recreational purposes.

(iv) Provides that allocations to recreational purposes shall be nonreimbursable.

#### Section 9 —

Provides that nothing in P. L. 485 shall be construed to alter, amend, repeal, construe, interpret, modify, or be in conflict with the provisions of certain Compacts and Acts already in effect.

#### Section 10 —

Exempts Flaming Gorge, Glen Canyon, Curcanti, and Navajo Storage Units from the soil survey and land classification requirements of the Interior Department Appropriation Act of 1954.



#### **Section 11 —**

Approves, makes effective immediately, and directs agencies of the United States to act in accordance with the Blue River decree entered into by the United States, City and County of Denver and certain parties on the western slope of Colorado.

#### **Section 12 —**

Authorizes the appropriation of not to exceed \$760 million for carrying out the purposes of P. L. 485.

#### **Section 13 —**

Directs the Secretary to take into consideration the achievement within each of the States of the fullest practicable use of the water consistent with the apportionments among the States in planning and using credits from power revenues available for assisting in the pay-out of costs of participating projects.

#### **Section 14 —**

(i) Directs the Secretary in the operation and maintenance of all Federal installations in the Colorado River Basin to comply with the terms of documents making up the law of the river.

(ii) Provides for instituting suits by any State in the U. S. Supreme Court as the court of original jurisdiction if the Secretary fails to comply with the law of the river and gives consent to join the United States as a party.

#### **Section 15 —**

Directs the Secretary to continue studies and report to Congress and the States on the quality of water of the Colorado River.

#### **Section 16 —**

Defines terms used in Public Law 485.



## B. Public Law 485

Public Law 485, with citations, as approved by President Eisenhower, is printed below:

Public Law 485 — 84th Congress  
Chapter 203 — 2d Session  
S. 500

### AN ACT

To authorize the Secretary of the Interior to construct, operate, and maintain the Colorado River storage project and participating projects and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That, in order to initiate the comprehensive development of the water resources of the Upper Colorado River Basin, for the purposes, among others, of regulating the flow of the Colorado River, storing water for beneficial consumptive use, making it possible for the States of the Upper Basin to utilize, consistently with the provisions of the Colorado River Compact, the apportionments made to and among them in the Colorado River Compact and the Upper Colorado River Basin Compact, respectively, providing for the reclamation of arid and semiarid land, for the control of floods, and for the generation of hydroelectric power, as an incident of the foregoing purposes, the Secretary of the Interior is hereby authorized (1) to construct, operate, and maintain the following initial units of the Colorado River storage project, consisting of dams, reservoirs, powerplants, transmission facilities and appurtenant works: Curecanti, Flaming Gorge, Navajo (dam and reservoir only), and Glen Canyon: Provided, That the Curecanti Dam shall be constructed to a height which will impound not less than nine hundred and forty thousand acre-feet of water or will create a reservoir of such greater capacity as can be obtained by a high water line located at seven thousand five hundred and twenty feet above mean sea level, and that construction thereof shall not be undertaken until the Secretary has, on the basis of further engineering and economic investigations, reexamined the economic justification of such unit and, accompanied by appropriate documentation in the form of a supplemental report, has certified to the Congress and to the President that, in his judgment, the benefits of such unit will exceed its costs; and (2) to construct, operate, and maintain the following additional reclamation projects (including power-generating and transmission facilities related thereto), hereinafter referred to as participating projects: Central Utah (initial phase): Emery County, Florida, Hammond, La Barge, Lyman, Paonia (including the Minnesota unit, a dam and reservoir on Muddy Creek just above its confluence with the North Fork of the Gunnison River, and other necessary works), Pine River Extension, Seedskaadee, Silt and Smith Fork: **Provided further**, That as part of the Glen Canyon Unit the Secretary of the

Colorado River  
storage project.

70 Stat. 105.

70 Stat. 106.

63 Stat. 31.

Initial units.

Curecanti Dam.  
Report to  
Congress and  
President.

Participating  
projects.

Rainbow Bridge  
National Monu-  
ment.

Interior shall take adequate protective measures to preclude impairment of the Rainbow Bridge National Monument.

Planning re-  
ports.  
Priority.

Reports to  
States, Presi-  
dent and  
Congress.

53 Stat. 785.

70 Stat. 106.

70 Stat. 107.

Juniper project.

Congressional  
intent.

63 Stat. 31.

Laws governing.

43 USC 371  
note,  
Repayment  
contracts.

SEC. 2. In carrying out further investigations of projects under the Federal reclamation laws in the Upper Colorado River Basin, the Secretary shall give priority to completion of planning reports on the Gooseberry, San Juan-Chama, Navajo, Parshall, Troublesome, Rabbit Ear, Eagle Divide, San Miguel, West Divide, Bluestone, Battlement Mesa, Tomichi Creek, East River, Ohio Creek, Fruitland Mesa, Bostwick Park, Grand Mesa, Dallas Creek, Savery-Pot Hook, Dolores, Fruit Growers Extension, Animas-La Plata, Yellow Jacket, and Sublette participating projects. Said reports shall be completed as expeditiously as funds are made available therefor and shall be submitted promptly to the affected States, which in the case of the San Juan-Chama project shall include the State of Texas, and thereafter to the President and the Congress: **Provided**, That with reference to the plans and specifications for the San Juan-Chama project, the storage for control and regulation of water imported from the San Juan River shall (1) be limited to a single offstream dam and reservoir on a tributary of the Chama River, (2) be used solely for control and regulation and no power facilities shall be established, installed or operated thereat, and (3) be operated at all times by the Bureau of Reclamation of the Department of the Interior in strict compliance with the Rio Grande Compact as administered by the Rio Grande Compact Commission. The preparation of detailed designs and specifications for the works proposed to be constructed in connection with projects shall be carried as far forward as the investigations thereof indicate is reasonable in the circumstances.

The Secretary, concurrently with the investigations directed by the preceding paragraph, shall also give priority to completion of a planning report on the Juniper project.

SEC. 3. It is not the intention of Congress, in authorizing only those projects designated in section 1 of this Act, and in authorizing priority in planning only those additional projects designated in section 2 of this Act, to limit, restrict, or otherwise interfere with such comprehensive development as will provide for the consumptive use by States of the Upper Colorado River Basin of waters, the use of which is apportioned to the Upper Colorado River Basin by the Colorado River Compact and to each State thereof by the Upper Colorado River Basin Compact, nor to preclude consideration and authorization by the Congress of additional projects under the allocations in the compacts as additional needs are indicated. It is the intention of Congress that no dam or reservoir constructed under the authorization of this Act shall be within any national park or monument.

SEC. 4. Except as otherwise provided in this Act, in constructing, operating, and maintaining the units of the Colorado River storage project and the participating projects listed in section 1 of this Act, the Secretary shall be governed by the Federal reclamation laws (Act of June 17, 1902, 32 Stat. 388, and Acts amendatory thereof or supplementary thereto): **Provided**, That (a) irrigation repayment contracts shall be entered into which, except as otherwise provided for the Paonia and Eden projects, provide for repayment of the obligation assumed thereunder with respect to any



project contract unit over a period of not more than fifty years exclusive of any development period authorized by law; (b) prior to construction of irrigation distribution facilities, repayment contracts shall be made with an "organization" as defined in paragraph 2 (g) of the Reclamation Project Act of 1939 (53 Stat. 1187) which has the capacity to levy assessments upon all taxable real property located within its boundaries to assist in making repayments, except where a substantial proportion of the lands to be served are owned by the United States; (c) contracts relating to municipal water supply may be made without regard to the limitations of the last sentence of section 9 (c) of the Reclamation Project Act of 1939; and (d), as to Indian lands within, under or served by any participating project, payment of construction costs within the capability of the land to repay shall be subject to the Act of July 1, 1932 (47 Stat. 564): **Provided further**, That for a period of ten years from the date of enactment of this Act, no water from any participating project authorized by this Act shall be delivered to any water user for the production on newly irrigated lands of any basic agricultural commodity, as defined in the Agricultural Act of 1949, or any amendment thereof, if the total supply of such commodity for the marketing year in which the bulk of the crop would normally be marketed is in excess of the normal supply as defined in section 301 (b) (10) of the Agricultural Adjustment Act of 1938, as amended, unless the Secretary of Agriculture calls for an increase in production of such commodity in the interest of national security. All units and participating projects shall be subject to the apportionments of the use of water between the Upper and Lower Basins of the Colorado River and among the States of the Upper Basin fixed in the Colorado River Compact and the Upper Colorado River Basin Compact, respectively, and to the terms of the treaty with the United Mexican States (Treaty Series 994).

SEC. 5. (a) There is hereby authorized a separate fund in the Treasury of the United States to be known as the Upper Colorado River Basin Fund (hereinafter referred to as the Basin Fund), which shall remain available until expended, as hereafter provided, for carrying out provisions of this Act other than section 8.

(b) All appropriations made for the purpose of carrying out the provisions of this Act, other than section 8, shall be credited to the Basin Fund as advances from the general fund of the Treasury.

(c) All revenues collected in connection with the operation of the Colorado River storage project and participating projects shall be credited to the Basin Fund, and shall be available, without further appropriation, for (1) defraying the costs of operation, maintenance, and replacements of, and emergency expenditures for, all facilities of the Colorado River storage project and participating projects, within such separate limitations as may be included in annual appropriation acts: **Provided**, That with respect to each participating project, such costs shall be paid from revenues received from each such project; (2) payment as required by subsection (d) of this section; and (3) payment as required by subsection (e) of this section. Revenues credited to the Basin Fund

43 USC 485a.

53 Stat. 1194.  
1195.

25 USC 386a.  
Restriction.

63 Stat. 1051.  
7 USC 1441  
note.

52 Stat. 41.  
7 USC 1281.

46 Stat. 3000;  
45 Stat. 1057.  
63 Stat. 31.  
59 Stat. 1219.

Basin Fund.

70 Stat. 107.

70 Stat. 108.

Availability  
of revenues.



shall not be available for appropriation for construction of the units and participating projects authorized by or pursuant to this Act.

(d) Revenues in the Basin Fund in excess of operating needs shall be paid annually to the general fund of the Treasury to return—

(1) the costs of each unit, participating project, or any separable feature thereof which are allocated to power pursuant to section 6 of this Act, within a period not exceeding fifty years from the date of completion of such unit, participating project, or separable feature thereof;

(2) the costs of each unit, participating project, or any separable feature thereof which are allocated to municipal water supply pursuant to section 6 of this Act, within a period not exceeding fifty years from the date of completion of such unit, participating project, or separable feature thereof;

(3) interest on the unamortized balance of the investment (including interest during construction) in the power and municipal water supply features of each unit, participating project, or any separable feature thereof, at a rate determined by the Secretary of the Treasury as provided in subsection (f), and interest due shall be a first charge; and

(4) the costs of each storage unit which are allocated to irrigation pursuant to section 6 of this Act within a period not exceeding fifty years.

Apportionment  
of revenues.

(e) Revenues in the Basin Fund in excess of the amounts needed to meet the requirements of clause (1) of subsection (c) of this section, and to return to the general fund of the Treasury the costs set out in subsection (d) of this section, shall be apportioned among the States of the Upper Division in the following percentages: Colorado, 46 per centum; Utah, 21.5 per centum; Wyoming, 15.5 per centum; and New Mexico, 17 per centum: **Provided**, That prior to the application of such percentages, all revenues remaining in the Basin Fund from each participating project (or part thereof), herein or hereinafter authorized, after payments, where applicable, with respect to such projects, to the general fund of the Treasury under subparagraphs (1), (2), and (3) of subsection (d) of this section shall be apportioned to the State in which such participating project, or part thereof, is located.

Revenues so apportioned to each State shall be used only for the repayment of construction costs of participating projects or parts of such projects in the State to which such revenues are apportioned and shall not be used for such purpose in any other

70 Stat. 108.

70 Stat. 109.

State without the consent, as expressed through its legally constituted authority, of the State to which such revenues are apportioned. Subject to such requirement, there shall be paid annually into the general fund of the Treasury from the revenues apportioned to each State (1) the costs of each participating project herein authorized (except Paonia) or any separable feature thereof, which are allocated to irrigation pursuant to section 6 of this Act, within a period not exceeding fifty years, in addition to any development period authorized by law, from the date of completion of such participating project or separable feature thereof, or, in the case of Indian lands, payment in accordance with section 4 of this Act; (2) costs of the Paonia project, which are beyond the

ability of the water users to repay, within a period prescribed in the Act of June 25, 1947 (61 Stat. 181); and (3) costs in connection with the irrigation features of the Eden project as specified in the Act of June 28, 1949 (63 Stat. 277).

(f) The interest rate applicable to each unit of the storage project and each participating project shall be determined by the Secretary of the Treasury as of the time the first advance is made for initiating construction of said unit or project. Such interest rate shall be determined by calculating the average yield to maturity on the basis of daily closing market bid quotations during the month of June next preceding the fiscal year in which said advance is made, on all interest-bearing marketable public debt obligations of the United States having a maturity date of fifteen or more years from the first day of said month, and by adjusting such average annual yield to the nearest one-eighth of 1 per centum.

(g) Business-type budgets shall be submitted to the Congress annually for all operations financed by the Basin Fund.

SEC. 6. Upon completion of each unit, participating project or separable feature thereof, the Secretary shall allocate the total costs (excluding any expenditures authorized by section 8 of this Act) of constructing said unit, project or feature to power, irrigation, municipal water supply, flood control, navigation, or any other purposes authorized under reclamation law. Allocations of construction, operation and maintenance costs to authorized non-reimbursable purposes shall be nonreturnable under the provisions of this Act. In the event that the Navajo participating project is authorized, the costs allocated to irrigation of Indian-owned tribal or restricted lands within, under, or served by such project, and beyond the capability of such lands to repay, shall be determined, and, in recognition of the fact that assistance to the Navajo Indians is the responsibility of the entire nation, such costs shall be non-reimbursable. On January 1 of each year the Secretary shall report to the Congress for the previous fiscal year, beginning with the fiscal year 1957, upon the status of the revenues from, and the cost of, constructing, operating, and maintaining the Colorado River storage project and the participating projects. The Secretary's report shall be prepared to reflect accurately the Federal investment allocated at that time to power, to irrigation, and to other purposes, the progress of return and repayment thereon, and the estimated rate of progress, year by year, in accomplishing full repayment.

SEC. 7. The hydroelectric powerplants and transmission lines authorized by this Act to be constructed, operated, and maintained by the Secretary shall be operated in conjunction with other Federal powerplants, present and potential, so as to produce the greatest practicable amount of power and energy that can be sold at firm power and energy rates, but in the exercise of the authority hereby granted he shall not affect or interfere with the operation of the provisions of the Colorado River Compact, the Upper Colorado River Basin Compact, the Boulder Canyon Project Act, the Boulder Canyon Project Adjustment Act and any contract lawfully entered into under said Compacts and Acts. Subject to the provisions of the Colorado River Compact, neither the impounding nor the use of water for the generation of power and energy at the plants of the Colorado River storage project shall preclude or impair the

Interest rate.

Budget to Congress.

Cost allocations.

Navajos.

Report to Congress.

Power plant operations.

70 Stat. 109.

70 Stat. 110.

45 Stat. 1057.

43 USC 617 note.

54 Stat. 774.

43 USC 618o.



Recreational and  
fish and wild-  
life facilities.

appropriation of water for domestic or agricultural purposes pursuant to applicable State law.

SEC. 8. In connection with the development of the Colorado River storage project and of the participating projects, the Secretary is authorized and directed to investigate, plan, construct, operate, and maintain (1) public recreational facilities on lands withdrawn or acquired for the development of said project or of said participating projects, to conserve the scenery, the natural, historic, and archeologic objects, and the wildlife on said lands, and to provide for public use and enjoyment of the same and of the water areas created by these projects by such means as are consistent with the primary purposes of said projects; and (2) facilities to mitigate losses of, and improve conditions for, the propagation of fish and wildlife. The Secretary is authorized to acquire lands and to withdraw public lands from entry or other disposition under the public land laws necessary for the construction, operation, and maintenance of the facilities herein provided, and to dispose of them to Federal, State, and local governmental agencies by lease, transfer, exchange, or conveyance upon such terms and conditions as will best promote their development and operation in the public interest. All costs incurred pursuant to this section shall be nonreimbursable and nonreturnable.

Saving provision.

43 USC 617  
note.  
43 USC 618o.

53 Stat. 785.  
59 Stat. 1219.  
Expenditures.

SEC. 9. Nothing contained in this Act shall be construed to alter, amend, repeal, construe, interpret, modify, or be in conflict with the provisions of the Boulder Canyon Project Act (45 Stat. 1057), the Boulder Canyon Project Adjustment Act (54 Stat. 774), the Colorado River Compact, the Upper Colorado River Basin Compact, the Rio Grande Compact of 1938, or the Treaty with the United Mexican States (Treaty Series 994).

68 Stat. 361.

Effectivity  
and approval  
of court  
decree, etc.

SEC. 10. Expenditures for the Flaming Gorge, Glen Canyon, Curecanti, and Navajo initial units of the Colorado River storage project may be made without regard to the soil survey and land classification requirements of the Interior Department Appropriation Act, 1954.

SEC. 11. The Final Judgment, Final Decree and stipulations incorporated therein in the consolidated cases of United States of America v. Northern Colorado Water Conservancy District, et al., Civil Nos. 2782, 5016 and 5017, in the United States District Court for the District of Colorado, are approved, shall become effective immediately, and the proper agencies of the United States shall act in accordance therewith.

Appropriation.

SEC. 12. There are hereby authorized to be appropriated, out of any moneys in the Treasury not otherwise appropriated, such sums as may be required to carry out the purposes of this Act, but not to exceed \$760,000,000.

Net power  
revenues.

SEC. 13. In planning the use of, and in using credits from, net power revenues available for the purpose of assisting in the pay-out of costs of participating projects herein and hereafter authorized in the States of Colorado, New Mexico, Utah, and Wyoming, the Secretary shall have regard for the achievement within each of said States of the fullest practicable use of the waters of the Upper Colorado River system, consistent with the apportionment thereof among such States.

SEC. 14. In the operation and maintenance of all facilities, authorized by Federal law and under the jurisdiction and supervision of the Secretary of the Interior, in the basin of the Colorado River, the Secretary of the Interior is directed to comply with the applicable provisions of the Colorado River Compact, the Upper Colorado River Basin Compact, the Boulder Canyon Project Act, the Boulder Canyon Project Adjustment Act, and the Treaty with the United Mexican States, in the storage and release of water from reservoirs in the Colorado River Basin. In the event of the failure of the Secretary of the Interior to so comply, any State of the Colorado River Basin may maintain an action in the Supreme Court of the United States to enforce the provisions of this section, and consent is given to the joinder of the United States as a party in such suit or suits, as a defendant or otherwise.

SEC. 15. The Secretary of the Interior is directed to continue studies and to make a report to the Congress and to the States of the Colorado River Basin on the quality of water of the Colorado River.

SEC. 16. As used in this Act —

The terms "Colorado River Basin", "Colorado River Compact", "Colorado River System", "Lee Ferry", "States of the Upper Division", "Upper Basin", and "domestic use" shall have the meaning ascribed to them in article II of the Upper Colorado River Basin Compact;

The term "States of the Upper Colorado River Basin" shall mean the States of Arizona, Colorado, New Mexico, Utah, and Wyoming;

The term "Upper Colorado River Basin" shall have the same meaning as the term "Upper Basin";

The term "Upper Colorado River Basin Compact" shall mean that certain compact executed on October 11, 1948 by commissioners representing the States of Arizona, Colorado, New Mexico, Utah, and Wyoming, and consented to by the Congress of the United States of America by Act of April 6, 1949 (63 Stat. 31);

The term "Rio Grande Compact" shall mean that certain compact executed on March 18, 1938, by commissioners representing the States of Colorado, New Mexico, and Texas and consented to by the Congress of the United States of America by Act of May 31, 1939 (53 Stat. 785);

The term "Treaty with the United Mexican States" shall mean that certain treaty between the United States of America and the United Mexican States, signed at Washington, District of Columbia, February 3, 1944, relating to the utilization of the waters of the Colorado River and other rivers, as amended and supplemented by the protocol dated November 14, 1944, and the understandings recited in the Senate resolution of April 18, 1945, advising and consenting to ratification thereof.

Operation and maintenance, compliance.

70 Stat. 110.

70 Stat. 111.

63 Stat. 31.

45 Stat. 1057;

54 Stat. 774.

43 USC 617

note, 618o.

59 Stat. 1219.

Report to Congress.

Definitions.

59 Stat. 1219.

Approved April 11, 1956.



## **C. Upper Colorado Project Financing**

The following article consists of a discussion of the method of financing the water resources development program incorporated in the legislation authorizing the construction, operation, and maintenance of the Colorado River Storage Project and participating projects:

### **Upper Colorado Project Financing:**

#### **Repayment Plan for Multipurpose Reservoirs**

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**Ival V. Goslin**

**Engineer-Secretary**

**Upper Colorado River Commission**

Proponents of reclamation projects in all states will be watching the experimental repayment plan under which multipurpose reservoirs of the Upper Colorado Project are to be financed. The plan — as detailed in Public Law 485, passed by Congress in its latest session — is unique. It is so because it involves two basic principles:

- The concept of comprehensive basin-wide development for river regulation and power production.
- The re-establishment of state lines in the use of excess power revenues for repayment of irrigation costs.

The over-all development known as the Upper Colorado River Storage Project was originally conceived and planned as a comprehensive basin-wide development of the water and power resources of the Upper Basin. For the most part, state lines were disregarded and emphasis was placed upon development of the Upper Basin rather than upon development of resources of the individual States; this concept was believed to conform to the intent of the Upper Colorado River Basin Compact.

Excess power revenues to be derived from the sale of hydroelectric energy produced at the large main-stem Storage Units were to be used to retire the costs of water-consuming irrigation projects

(participating projects) that were beyond the capability of the water users to repay without regard to State location of the projects as long as they were situated within one of the four Upper Basin States.

## ● COLORADO OBJECTED

The Governor of Colorado and people on the western slope of that state objected to legislation as originally introduced in the Congress to initiate the development under this strict basin-wide principle, which, in effect, erased state lines. Their objections were based upon the premise that the legislation did not provide sufficient and equitable benefits for the State of Colorado which received 51.75% of the consumptive use of water under the Upper Basin Compact and from whose watershed comes about 70% of the virgin flow of the river.

To overcome these objections and allay the fears of Colorado that the construction of water-use projects in the other three States might proceed more rapidly and to the detriment of future developments in Colorado, it was proposed by the Colorado Governor that excess power profits from the power-producing Storage Units, such as the Glen Canyon Dam, should be credited to a fund within the U. S. Treasury in percentage apportionments the same as water allocations in the Upper Basin Compact (see table). These revenues credited to each State were to be used for paying for participating projects within each State; thus, limiting the possible future development of water resources in each State to the amount of money available to its credit, because all of the projects would need financial help from some outside source, such as money collected from power revenues.

## ● CREDITS REFINED

A further study of this complicated and controversial problem revealed that apportioning the excess power revenues on the same basis as the percentage allocations of consumptive use of water in the Upper Basin Compact would not make possible repayment of the costs of participating projects in two of the States because of the high cost of those projects and the small amount of revenue going to those States under the apportionment formula.

Consequently, the proposition then was advanced that the power profits should be credited for use within the individual States on the basis of the percentage of presently unused consump-



tive use of water remaining in each State from its apportionment in the Upper Colorado River Compact, with modifications to allow for exceptional conditions existing in any particular State. These percentages were based upon the assumption that under the terms of the Colorado River Compact of 1922 there would be 7,500,000 acre-feet of water available per year to the Upper Basin.

This latter proposition is incorporated in Public Law 485. Therefore, we now have a Law on the books providing for the authorization of a federal water resources development program which provides for a comprehensive basin-wide development of the water and power resources by large main-stem power-producing and river-regulating dams and reservoirs, but which guarantees the use of excess revenues for the repayment of costs of water-use projects in individual States.

#### ● LAW IS DIFFERENT

The repayment features and accounting and funding requirements for the Colorado River Storage Project differ greatly from those for reclamation projects previously authorized by Congress. In summary, Public Law 485 provides:

1. for the creation of an Upper Colorado River Basin Fund to which all **appropriations** from the general fund of the U. S. Treasury shall be credited as advances, except those for recreational purposes, which are nonreimbursable;
2. that all **revenues** (power, municipal water, irrigation or other) derived from Storage Units or water-using participating projects shall be credited to the Basin Fund and shall be available for paying operation, maintenance and repair and emergency costs, and costs of power and municipal water features of Storage Units and participating projects within 50 years with interest;
3. that each participating consumptive-use project must pay its own operation, maintenance and emergency charges from its own revenues;
4. that costs of Storage Units allocated to irrigation shall be returned from revenues in the basin fund within 50 years;

5. that revenues in the Basin Fund in excess of amounts needed to defray costs under (2), (3), and (4) above shall be apportioned within the Basin Fund to the credit of the States as follows:

Colorado	46.0%
New Mexico	17.0%
Utah	21.5%
Wyoming	15.5%

for the purpose of returning the costs of irrigation allocations of participating projects within 50 years that are beyond the ability of the water users to repay;

6. that if a participating project has power and/or municipal water facilities in addition to irrigation facilities, it must pay from its own revenues the operation, repair and maintenance and emergency charges for all its facilities, repayment of its power costs and its municipal water costs, and interest on its own power and municipal water investments;

**Based on the Colorado River Compact of 1922:**

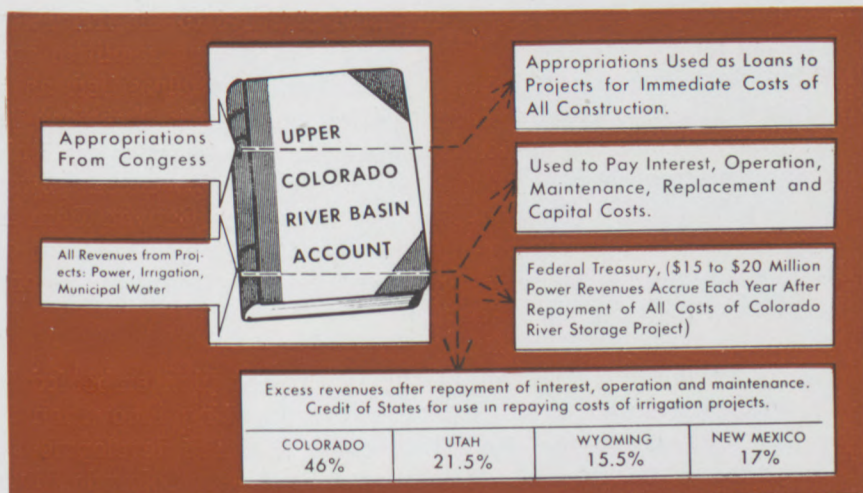
Consumptive use of the waters of the Colorado River System was divided between the Upper Basin (Colorado, New Mexico, Utah, Wyoming) and Lower Basin (Arizona, California, Nevada) by the Colorado River Compact of 1922. Subject to the provisions and limitations contained in the 1922 compact, the five states of the Upper Basin in 1948 agreed under the terms of the Upper Colorado River Basin Compact to an apportionment of waters allocated to the Upper Basin in the following manner:

Arizona (a lower basin state)	50,000 acre-ft. per yr.
Colorado	51.75% of the balance
New Mexico	11.25% of the balance
Utah	23.00% of the balance
Wyoming	14.00% of the balance

The Upper Colorado River Basin Compact also created the Upper Colorado River Commission, through which the four Upper Division States (Colorado, New Mexico, Utah and Wyoming) act as a unit in securing the expeditious agricultural and industrial development of the Upper Basin.

7. that after all the costs of (6) are paid from the revenues of the participating project, if there are excess revenues remaining in the Basin Fund that were derived from its own power and/or





municipal water facilities, the excess is credited within the Basin Fund for use within the State wherein the project is located before the percentage apportionments of (5) above are applied;

8. that excess power revenues credited within the Basin Fund to each State may be used for repaying costs of irrigation projects only within that State, and may not be used within another State unless appropriate consent is obtained;

9. that business-type budgets must be submitted each year to Congress.

Development of resources within each of the States is only indirectly limited by the water supply or by the allotment of water under compacts. The direct limiting factor has become the amount of money credited within the Basin Fund for use within each State.

Among the other unique features of this reclamation law is the manner of treating costs of projects which will create benefits for the Navajo Indian Tribe. In recognition of the fact that assistance to these Indians is the responsibility of the entire nation, and not of the State of New Mexico alone, the legislation specifies that when the Navajo Irrigation Project is authorized, the costs of irrigation allocations beyond the capability of the land to repay shall be nonreimbursable.

Another part of the law states that payment of construction costs within the capability of the land to repay will be deferred for as long as the land remains in Indian ownership. In addition, the

Navajo Dam and Reservoir, prerequisite features to the irrigation of Indian lands, which will have no power-producing facilities and limited river-system-regulation values, has been classified as a Storage Unit. By virtue of this classification and the fact that its estimated cost of \$36.6 million is allocated mostly to irrigation, this dam and reservoir will be almost entirely paid for by excess power revenues from other Storage Units, such as Glen Canyon Dam in Arizona, because revenues used to pay for irrigation allocations of Storage Units are not subject to percentage apportionments among the States which are discussed above.

The exceptional features of the repayment plan embodied in this new reclamation law constitute an interesting innovation in the financing of regional and State water resource developments. For this reason the people of the States of the Upper Colorado River Basin, through their representatives on the Upper Colorado River Commission, must continue to recognize the responsibility with which they have been charged under the law and must work closely together in order to make this complex scheme succeed.





## D. Authorized Storage Units

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

Of major importance to the Upper Colorado River Basin States is the fact that the construction of four Storage Units of the Colorado River Storage Project and the eleven participating projects was authorized in Section 1 of Public Law 485. The four authorized Storage Units are Glen Canyon, Flaming Gorge, Navajo and Curecanti. Combined they will provide about 35,210,000 acre-feet of reservoir capacity, and about 1,137,000 kilowatts of installed generating capacity.

### 1. Glen Canyon Unit

The Glen Canyon Dam and Reservoir will comprise the key Storage Unit and will be the largest of the initial four. It will provide about 80% of both the storage and generating capacity and will be roughly comparable in size to Hoover Dam and Lake Mead. The concrete gravity-arch dam located in northern Arizona on the Colorado River, 12.4 miles downstream from the Utah-Arizona state line, and 15.3 miles upstream from Lees Ferry will extend 580 feet above the river. It will be a little lower than Hoover Dam and will be the second highest dam in the United States. The reservoir will have a capacity of 28 million acre-feet and will extend 186 miles upstream on the Colorado River, and 71 miles up the San Juan River. The power house, which will be located at the toe of the dam, will have eight generating units with a total installed capacity of 900,000 kilowatts.

### Construction Activities

Temporary construction headquarters for the Glen Canyon Dam and Reservoir have been established at Kanab, Utah, 70 miles west of the dam site. The State of Utah has constructed a dirt access road between the site and Kanab. Telephone lines have been installed by the Mountain States Telephone and Telegraph Company. Twenty-five miles of access road are under construction to the dam site from Bitter Springs, Arizona. This road will be built to the standards of a primary highway with Arizona paying 10% of the cost.

The contract has been awarded for a bridge spanning the Colorado River 1,000 feet downstream from the dam site. This bridge, 1,271 feet long, will be a steel-arch structure, 40 feet wide and 700 feet above the river, making it the highest bridge of its type in the world. Its single arch will be 1,028 feet in length, second only to the Bayonne Bridge between Staten Island, New York and New Jersey. More than 3,500 tons of structural steel, 250 tons of reinforcing steel, and 2,650 cubic yards of concrete will be utilized in its construction.

A diversion tunnel through the right abutment of the dam site is under construction. The contract for this tunnel was awarded in October, 1956.

Specifications for the dam and power plant will be completed early in 1957. The prime contract for the construction of these two features is expected to be awarded in the spring of 1957.

## **2. Flaming Gorge Unit**

The Flaming Gorge Dam and Reservoir will be located on the Green River in northeastern Utah, 40 miles north of Vernal, Utah, and 32 miles downstream from the Utah-Wyoming state line. The dam will be a concrete thin-arch structure rising 440 feet above the river. The reservoir will have a capacity of 3,920,000 acre-feet and will extend upstream 94 miles, nearly to the town of Green River, Wyoming. The power plant will have an installed generating capacity of 85,000 kilowatts.

## **Construction Activities**

Construction activities at Flaming Gorge are being conducted from temporary headquarters at Vernal, Utah. Diamond drilling, to determine foundation conditions for final design, is well advanced. Contracts have been awarded for the construction of 0.3 of a mile of new roadway, rehabilitation of seven miles of existing road, and the construction of a timber bridge, 345 feet in length, across the Green River. The Bureau of Reclamation plans to let a contract for the remaining ten miles of the road early in the spring of 1957. After the completion of this stretch, the dam site will be connected by an oiled highway with a railhead at Green River, Wyoming. A Government town will be located on Dutch John Flat about three miles north of the dam. Approach roads from Vernal, Utah, are being improved by the State of Utah and the U. S.



Forest Service. About May, 1957 the Bureau expects to let a contract for a diversion tunnel. Following completion of a definite plan report, the prime contract for the dam and power plant will be awarded in the fall of 1957.

### 3. Navajo Unit

The Navajo Dam will be located in northwestern New Mexico on the San Juan River, 34 miles east of Farmington, and  $3\frac{1}{2}$  miles downstream from the confluence of Los Pinos and San Juan Rivers. The dam will be of rolled earth-fill embankment type. The original plan included a reservoir with a capacity of 1,450,000 acre-feet. More recent studies, however, indicate a reservoir size of 1,700,000 acre-feet with an active capacity of 960,000 acre-feet. After a joint study of the optimum capacity of the reservoir by the State of New Mexico and the Bureau of Reclamation, the Interstate Stream Commission of the State recommended that a 1,700,000 acre-foot reservoir be constructed. Sediment accumulation in the reservoir will be heavy and will amount to 330,000 acre-feet over a 100-year period, much of the sediment being deposited in the inactive section of the reservoir. This reservoir will be used to regulate the flows of the San Juan River for the potential Navajo Irrigation Project near Farmington, the San Juan-Chama Project on the eastern side of the mountains, and perhaps for the small authorized Hammond Project. A part of the water made available to the Navajo Irrigation Project also may be used for industrial and municipal purposes. A small amount of flood protection to downstream developments and some recreational facilities will also be provided.

### Construction Activities

Eight hundred thousand dollars were earmarked in the Appropriations Act for 1957 for the start of construction on Navajo Dam. Engineering and geologic investigations are being undertaken as a basis for final designs and specifications. Temporary headquarters have been established at Farmington, New Mexico, to complete preconstruction investigations and to administer a construction contract for an access road.

### 4. Curecanti Unit

The Curecanti Storage Unit will be located on the Gunnison River in western Colorado, upstream from the Black Canyon

National Monument and downstream from the town of Gunnison. In order to prevent damage to property near the town, the authorizing legislation provides that Curecanti Dam shall be constructed to a height to store not less than 940,000 acre-feet of water, or to create a reservoir of such greater capacity as can be obtained by a high-water line located at 7,520 feet above sea level. Construction will not be commenced until further engineering and economic studies have been made and until the Secretary of the Interior has certified to the Congress and the President that the Curecanti Unit is economically justifiable.

Studies show that a favorable plan would include a series of several dams, reservoirs, and power plants along the 35-mile river section. These power plants would have an installed generating capacity of about 152,000 kilowatts and would develop about 970 feet of static power head. The Curecanti Reservoir, the highest upstream of the series, would be formed by Blue Mesa Dam, located 30 miles downstream from Gunnison. This dam, about 350 feet high, would create a reservoir with a capacity of about 940,000 acre-feet at a high water elevation of 7,520 feet. This reservoir would provide seasonal regulation for a power plant at Blue Mesa Dam and for power plants at other dams in the 15-mile reach of river downstream. Detailed planning investigations of the Curecanti Unit should be completed in the near future.

### Construction Activities

Investigations of the Curecanti Storage Unit are being conducted from the Upper Colorado River office in Salt Lake City, Utah. One immediate problem is to determine whether a single high dam at Morrow Point, or a lower dam there, in combination with another dam upstream at the Blue Mesa site, should be used to develop the power head above Morrow Point. Cost estimates for alternatives are now being prepared by the Bureau of Reclamation. Detailed topography of the Morrow Point and Crystal Dam sites is being obtained under photogrammetric contract. A special report to meet the requirements for Secretarial Certification under the authorizing Act is to be prepared by June, 1957. It will be followed by a definite plan report later in the same year.





## **E. Initially Authorized Participating Projects**

Of the eleven participating projects authorized by Public Law 485, five are in Colorado, one is in New Mexico, two are in Utah, and three are located in Wyoming. Participating projects are those which will consume water of the Upper Colorado River System for irrigation, municipal, and industrial purposes, and which will participate in the use of revenues in the Basin Fund to help repay the costs of irrigation features beyond the ability of the water users to repay.

It has been impossible for the Bureau of Reclamation to undertake work simultaneously on all eleven participating projects because of the large amount of investigational work needed to firm the development plans and to make cost estimates and repayment studies. Therefore, the Bureau has sought the advice of officials of each State and on their recommendations has selected specific projects on which to concentrate its work in order to get construction underway on three or four of the participating projects as soon as possible.

At the date of this report none of the participating projects or divisions thereof authorized for construction by Public Law 485 are under construction.

A brief description of each of the authorized participating projects and the present status of its investigations follow:

### **1. Authorized Colorado Participating Projects**

#### **a. Paonia Project**

This project is located near Paonia in west-central Colorado on the North Fork of the Gunnison River. The Paonia Reservoir will be constructed to a capacity of 21,000 acre-feet. The Fire Mountain Canal will be completed, enlarged, and extended to distribute the project water. By these means, the irrigation water supply will be improved for an additional 13,070 acres of irrigated land and a full water supply provided for about 2,230 acres of new land. Fish and wildlife values in the area will be enhanced, and flood damages will be decreased.

Advanced planning for this project has consisted of detailed surveys and studies that have been concentrated on the determination of storage capacity needed at Paonia Reservoir site and on

the assembling of engineering data needed for preparation of final designs and specifications for the dam. A revised set of the water supply operation studies has been completed which will require a total storage capacity of about 21,000 acre-feet. Completion of a definite plan report, which will describe proposed construction work on the dam and additional earth-lining on parts of the Fire Mountain Canal, is scheduled for about April, 1957. The Bureau has discussed necessary revisions in the repayment contract with the water users, but the final decision as to whether the present contract will be amended, or whether a new contract will be needed, is to be deferred until completion of a definite plan report. It was originally planned that construction should start on the Paonia Project in July of 1957. The actual start of construction will depend on the availability of construction funds.

#### b. Florida Project

The Florida Project is located in southwestern Colorado, southeast of Durango in the Florida River Valley and on Florida Mesa. Its principal features include the construction of Lemon Dam on the Florida River with a reservoir capacity of 23,300 acre-feet, enlargement of the Florida Farmers Ditch, and the construction of a new diversion dam. The laterals will be constructed to 6,300 acres of project lands. Drainage facilities will also be built. Flood control and fish and wildlife values will be improved. The project includes 6,300 acres of new land and 12,650 acres of presently irrigated land needing a supplemental water supply. Investigational work needed for a definite plan report has included the taking of project land topography. Topographic surveys of the Lemon Reservoir site have been taken and about 50% of the project lands have been classified in detail.

#### c. Smith Fork Project

The Smith Fork Project is located in Delta County, along the Smith Fork of the Gunnison River near Crawford, Colorado. Its principal features will include the construction of Crawford Reservoir on Iron Creek, capacity 14,000 acre-feet, a diversion from Smith Fork Dam on Smith Fork with head works on a sluiceway, a Smith Fork Feeder Canal  $2\frac{3}{4}$  miles from the diversion dam and Crawford Reservoir, and 6.6 miles of canals to project lands. The acreage to be irrigated contains 2,270 acres of new land and 8,160 acres of land presently irrigated but needing a supplemental supply of water.



The people of the area have taken the initial steps in the organization of a Conservancy District for contracting with the Federal Government. It is planned to have this Conservancy District fully organized by August, 1957 in order to get a tax levy established for the calendar year 1958. Detailed investigations, as needed for a definite plan report, are scheduled to be undertaken in 1957 as soon as work on the Paonia Project will permit.

#### d. Pine River Project Extension

This project involves an extension to be made to the existing Pine River Project in southwestern Colorado and northwestern New Mexico on Pine River about 20 miles east of Durango, Colorado. This extension will provide water from the existing Vallecito Reservoir for the irrigation of about 15,150 acres of irrigable land, of which about 1,940 acres are within the Pine River Indian Irrigation Project. The project will involve an enlargement and extension of eight major canals and ditches diverting from Pine River, a new diversion dam, and several small distribution laterals. Of the acreage irrigated, 14,520 acres of new land are in Colorado and 630 acres in New Mexico. Completion of the definite plan report is scheduled early in 1959.

Initial water supply studies show that the proposed development probably cannot be made unless new lands to be served receive direct flow ahead of storage in Vallecito Reservoir. A clarification of water-rights will be necessary. Detailed land classification surveys and topographic surveys are proceeding. Topography of the project lands should be available soon.

#### e. Silt Project

An improved water supply for more than 5,400 acres of partially irrigated land, and a full supply for about 1,900 acres of new land will be provided by construction of the Silt Project between Rifle and Elk Creeks in west-central Colorado. Construction features will include the Rifle Gap Reservoir of 10,000 acre-feet capacity, a pumping plant, diversion dam and feeder canal, rehabilitation of existing works and construction of laterals and drains.

Initiation of definite plan investigations on the Silt Project has been scheduled to follow work on the Paonia and Smith Fork

Projects. A contract has been awarded for topographic mapping of the Silt Project lands. It is planned to complete the detailed land classification in the spring of 1957.

## **2. Authorized New Mexico Participating Projects**

### **a. Hammond Project**

Irrigation water would be supplied for 3,670 acres of new lands lying in a narrow 20-mile strip along the south side of the San Juan River opposite the towns of Blanco, Bloomfield, and Farmington, New Mexico. Project works would include the Hammond Diversion Dam on the San Juan River, a 28-mile gravity canal, and a pumping unit to lift water to the East and West Highline laterals, minor distribution ditches, and a drainage system.

Land classification for this project has been finished. A site for the head works of the Main Canal has been inspected. The field office is compiling field data for the design of a diversion dam. There is still a question of water rights to be settled, but the program calls for having a definite plan report completed by September, 1957.

## **3. Authorized Utah Participating Projects**

### **a. Emery County Project**

The Emery County Project would provide supplemental water for 20,450 acres of land and a full supply for 3,630 acres in Emery County in east-central Utah near the towns of Huntington, Castle Dale, and Orangeville. Principal construction features would include the Joes Valley Dam and Reservoir which would impound 57,000 acre-feet of water on Cottonwood Creek, the Swasey Diversion Dam located ten miles downstream from Joes Valley, and the 17-mile Cottonwood-Huntington Canal heading at the Swasey Diversion Dam. Canals, laterals and drains would be constructed as required.

The completion of the definite plan report for this project is subject to completion of a similar report on the Central Utah Project. It will probably be 1958 before actual definite planning can get started. The first work that will be accomplished will be classification of the land, with the project report to be completed by September, 1959.



#### b. Central Utah Project (Initial phase)

The Central Utah Project (initial phase) would intercept streams draining the southern slope of the Uinta Mountains in the Colorado River Basin and would convey the water by gravity flow through the Wasatch Mountains to the Bonneville Basin for power generation, irrigation, municipal and industrial use, and other purposes in central Utah. Water conservation for irrigation, municipal use, and other purposes would also be accomplished in Utah's Uinta Basin, a part of the Colorado River Basin. Supplemental water would be furnished for 131,840 acres and a full supply would be furnished for 28,540 acres not presently irrigated. Municipal and industrial water averaging 48,800 acre-feet annually would be provided, and power averaging 373,000,000 kilowatt-hours annually would be generated at project plants with installed capacities totaling 61,000 kilowatts.

The potential Strawberry Aqueduct would intercept flows of Rock Creek and other Uinta Mountain streams west of Rock Creek and convey the water to the existing Strawberry Reservoir which would be enlarged by the construction of Soldier Creek Dam below the present dam. The reservoir water would be released through an enlargement of the present tunnel to the headwaters of Spanish Fork River in the Bonneville Basin. In descending Spanish Fork Canyon, the water would flow through a series of power plants before being consumptively used in the central Utah area. Through various exchanges and by the construction of the required facilities, the water would be made available to an area extending from Salt Lake City south 75 miles to Nephi.

New project works that would develop water for use in the Uinta Basin would include Hanna Reservoir on the North Fork of Duchesne River, Starvation Reservoir on Strawberry River with a feeder canal from the Duchesne River, Upalco Reservoir offstream from Lake Fork River, Stanaker Reservoir with a feeder canal from Ashley Creek, and Tyzack Reservoir on Brush Creek. The Stanaker Reservoir is a feature of the Vernal Unit of the Central Utah Project upon which the first construction activities are scheduled.

In Utah, this project has priority. The Bureau is working as rapidly as possible with the limited manpower available. A definite plan report for the Vernal Unit will be ready for processing by April, 1957. It will probably be about June, 1960 before a definite plan report for the entire initial phase of the Central Utah Project can be completed.

#### 4. Authorized Wyoming Participating Projects

##### a. La Barge Project

The La Barge Project would include a diversion dam located on the Green River at a point about six miles east of Big Piney, Wyoming, and a canal 40 miles long extending along the west side of the river from the dam to the vicinity of La Barge, Wyoming. About 7,970 acres located in a strip two miles or less in width between the canal and the river would be irrigated. Only about 300 acres of these lands receive any irrigation water at the present time. Distribution laterals and drains would be constructed as needed.

Miscellaneous investigations are proceeding on the La Barge Project. The completion of a definite plan report is scheduled for about June, 1960. It will follow the advanced planning on the Seedskaadee Project.

##### b. Lyman Project

Supplemental irrigation water would be provided for 40,600 acres of land along Blacks Fork of the Green River near Lyman, Wyoming. A dam would be constructed at the Bridger site on Willow Creek, creating a reservoir with a total capacity of 43,000 acre-feet. Surplus flows of Blacks Fork and its tributary, West Fork of Smiths Fork, would be conveyed to the reservoir by separate feeder canals. About 7½ miles of the Willow Creek channel below the reservoir would be enlarged, and three canals would be constructed to divert flows from the enlarged channel. Existing canal systems would be improved and extended as necessary, in addition to construction of new drains.

Miscellaneous investigations are proceeding on the Lyman Project. The completion of a definite plan report is scheduled for about March, 1960. It will follow the advanced planning on the Seedskaadee Project.

##### c. Seedskaadee Project

The Seedskaadee Project would provide for the irrigation of approximately 60,720 acres of dry arable land along both sides of the Green River in an area extending from 14 to 50 miles northwest of Green River, Wyoming. Original plans call for the diversion



of water directly from the Green River at a point approximately 13 miles above the upper end of the project lands. The project works would include a diversion dam and a system of canals and laterals with two hydraulic driven pumps and a few miles of drains. Modification of the plan to include storage at the Fontenelle Dam site on the Green River, located four miles upstream from project lands, may be found desirable during the definite plan stage of the investigations.

The Seedskadee Project has been given a first priority in Wyoming. The land classification work is completed. The canals below the proposed diversion dam are being designed. Water supply studies have been made. There has been a question regarding the advisability of having a simple diversion dam on the river or to have storage in connection with the project. A decision on this point will be made soon, after which detailed investigations can be made. It has also been proposed that a large bird refuge be constructed in conjunction with the Seedskadee Project. It will probably be March, 1958 before a definite plan report can be finished.



**F. Projects Having Priority for Investigations  
Under Public Law 485, 84th Congress, 2d Session,  
Following Completion of Definite Plan  
Investigations on Authorized Projects**

The following project descriptions are based on reconnaissance surveys and analyses made by the U. S. Bureau of Reclamation. Modifications in many of the project plans may result from more detailed investigations.

**1. Juniper Project**

In Section 2 of Public Law 485, priority is also given to the completion of a planning report on the Juniper Project. It is not specified in the Act whether it is to be a Storage Unit or a participating project. Its classification will be determined by the type of project planned and the course of future events.

A dam at the Juniper site would be located on the Yampa River in northwestern Colorado about ten miles upstream from the village of Maybell.

With reference to reservoir sites, there is competition between the site for the Cross Mountain Reservoir as originally planned as one of the Storage Units and the site for the proposed Juniper Reservoir. At the Cross Mountain site, any dam more than 145 feet high would inundate the Juniper site.

On Deadmans Bench in Colorado and Utah are about 90,000 acres of new land which could be served by a canal diverting from the Yampa River. Preliminary studies indicate that a feasible plan would involve storage at either the Juniper or Cross Mountain Reservoir sites on the Yampa River. Power generation at either or both and at the downstream Lily Park site below the junction of the Yampa and Little Snake Rivers would probably be valuable increments to the irrigation plan. A dam 215 feet high at Lily Park would back water to the Cross Mountain site.

It is reported that in terms of cost per acre-foot of storage, the Cross Mountain site is the most easily justified economically in the Upper Colorado River Basin. By providing approximately 3,000,000 acre-feet of storage, a gravity diversion could be made to the Deadmans Bench lands. The total amount of storage would be dependent upon the amount of electrical energy to be developed.



## 2. Participating Projects Being Investigated For Feasibility Reports

### COLORADO

#### a. Fruitland Mesa Project

This project will provide irrigation water to 11,700 acres of new land and to 7,700 acres inadequately irrigated land on Fruitland Mesa and along the valleys of Crystal and Iron Creeks between Crawford, Colorado, and the Black Canyon of the Gunnison National Monument. The Soap Park Reservoir with a capacity of 25,000 acre-feet would be constructed on Sapinero Creek. An aqueduct consisting of  $2\frac{1}{2}$  miles of bench flume and seven miles of tunnel, heading at the reservoir, would convey released storage water and natural flows of Curecanti Creek to Crystal Creek. At a lower point on Crystal Creek the water would be rediverted through the potential enlargement of the existing Gould Reservoir Feeder Canal to the potential Fruitland Mesa Highline Canal and to the Gould Reservoir which would be enlarged from its present capacity of 9,000 acre-feet to 25,000 acre-feet. The Fruitland Mesa Highline Canal, 14 miles in length, would serve land above the service area of the Gould Reservoir.

This project is being given top priority in the feasibility investigations stage. Water users have been extremely short of water in this area and are anxious that a project report be completed as soon as possible. Geologic explorations and some field surveys, such as topographies for the Bip Soap Park and Gould Reservoirs, have been completed. Preliminary water supply studies and rough estimates for plan formulation purposes have been made. Final studies, however, must wait completion of office work on the detailed land classification. It is apparent that available water supplies will limit the acreage of new land which can be served and that it will be necessary to select those areas and classes of land which can be irrigated most advantageously. The feasibility report will be completed in 1958.

#### b. Bostwick Park Project

The Silver Jack Reservoir, capacity 9,000 acre-feet, will be constructed on Cimarron Creek just below the west and main forks of the creek. The existing 25-mile long Cimarron Canal, which heads about three miles downstream from the reservoir site, would be improved and rehabilitated as necessary to convey additional

project water. Water would be provided for new lands on the west side of Bostwick Park through a two-mile extension of the Bostwick Park lateral. The project would serve 1,040 acres of new land and 5,830 acres presently irrigated but in need of additional water, all located east of Montrose, Colorado. Feasibility investigations on this project were started in 1956. Because adequate water supply records were available for detailed investigation, this project was selected over others in western Colorado. Detailed land classification surveys have been made. The tabulations and office work on the areas classified are not yet complete. Topographic surveys for the proposed enlargement and rehabilitation of the Cimarron Canal are in progress. Completion of the feasibility report will follow completion of the Fruitland Mesa feasibility report in 1958.

#### c. Dolores Project

Surplus flows of the Dolores River would be regulated in the potential 328,000 acre-foot McPhee Reservoir on the river channel, and used to supplement present irrigation supplies on 30,500 acres and would provide a full supply for 35,450 acres in the vicinity of Cortez and Dove Creek, Colorado. Two outlets through the low divide on the west side of the reservoir would replace existing diversion routes across the Divide that convey the Dolores River water to lands in Montezuma Valley. Existing canals of the Montezuma Valley Irrigation Company would be served from both outlets and would be enlarged, if necessary. From one of these outlets the potential Yellow Jacket Canal would extend northwest 24 miles to the potential north and south canals that would serve lands in the Dove Creek area. Topographic surveys of project lands and detailed land classification work undertaken immediately after completion of the status report in May, 1954 are about 50% complete. Preliminary water supply studies have been completed which indicate that not all of the potential land areas can be served. Completion of a feasibility report is scheduled for 1959.

#### d. Animas-LaPlata Project

This project would provide supplemental irrigation water for 20,100 acres and a full supply for 45,920 acres of land in southwestern Colorado. It would also provide supplemental water for 15,060 acres and a full supply for 5,540 acres of land in northwestern New Mexico. A 30,000 acre-foot reservoir would be created on the Animas River by a dam at the Teft site 22 miles upstream from Durango, Colorado. From the reservoir, the Animas-LaPlata Diver-



sion Canal would extend southwest 49.2 miles to project lands in the LaPlata River Basin. The canal would also intercept flood flows of the LaPlata River and serve as a feeder for the potential 50,000 acre-foot Hay Gulch Reservoir. The Dry Side and Red Mesa Canals would convey water from Hay Gulch Reservoir to project lands. The McDermott and Ring Cone Canals would receive and distribute water from the Animas-LaPlata Diversion Canal. The Meadows Diversion Canal would head on the LaPlata River below much of the project area and serve as a feeder for the 12,000 acre-foot Meadows Reservoir. Its water supply would include flood flows of the river plus return flows from higher irrigated lands and releases from the Hay Gulch Reservoir. Water released from the Meadows Reservoir would be used on presently undeveloped lands north of Kirtland, New Mexico.

The potential plan of development for the Animas-LaPlata Project was outlined in a status report dated November, 1954. Very little detail work has been undertaken since that time. The Bureau of Reclamation awarded a contract last year for photogrammetric mapping of project lands in the LaPlata, Colorado, McDermott and Dry Side areas.

The lands of the Ute Mountain Indian Tribe in the Dry Side area were originally included in the contract but were excluded when the necessary rights of ingress and egress could not be obtained. The Tribe has now reversed its stand and is asking that its lands be included as part of the potential project.

Limited detailed land classification work has been planned for the winter of 1957 if weather conditions permit. The large land classification job cannot be accomplished, however, until similar work on the Pine River Extension, the Florida, and the Dolores Projects is finished.

#### e. West Divide Project

Surplus flows of Crystal River, a tributary of the Colorado River, would be regulated by the Osgood Reservoir, 99,500 acre-feet capacity, formed by a dam 250 feet high at a point about 30 miles south of Glenwood Springs, Colorado. Water released from the reservoir would flow in a westerly direction successively through the Redstone Conduit, 10 miles, West Divide Tunnel, 15.8 miles, and Horsethief Canal, 72.6 miles to project lands. Branches from this conveyance system would include the Four Mile Canal, 22.8 miles long, heading at the lower end of the Redstone Conduit, and



the Garfield Canal, 39.2 miles long, heading at the lower end of the West Divide Tunnel. Two reservoirs along the route of the conveyance system would regulate Osgood Reservoir releases in excess of immediate irrigation needs as well as surplus flows on the streams on which the two reservoirs are located. These are the Kendig Reservoir, 12,000 acre-feet capacity, formed by a dam 168 feet high on West Divide Creek and the West Mamm Creek Reservoir, 6,500 acre-feet capacity, formed by a dam 174 feet high on West Mamm Creek. The project would provide irrigation water to 40,500 acres of new land and 25,110 acres presently irrigated, but in need of supplemental water. The project lands are generally immediately south of the Roaring Fork and the Colorado Rivers and extend from Carbondale west to DeBeque, Colorado.

Since the foregoing plan was formulated from reconnaissance study, further attention has been given to alternative means of conveying Osgood Reservoir water to the project area and of including power generation and municipal water as project purposes. A formal report on these modifications has not been prepared.

The State of Colorado is planning to have topographic mapping done on part of the area for use in land classification surveys as soon as possible after July 1, 1957. The Bureau of Reclamation is planning to award a contract in July, 1957 for the topographic mapping of the rest of the area.

#### f. San Miguel Project

Surplus flows in the San Miguel River would be controlled by the Saltado Reservoir, 53,000 acre-feet capacity, formed by a dam 282 feet high above the streambed at a point about eight miles southeast of Norwood, Colorado. Released reservoir water would flow successively in the Saltado and Norwood Tunnels having a combined length of 8.8 miles and extending to a point near Norwood, thence in the Main Canal extending 45.5 miles southwesterly, to project lands. The Gypsum Valley Lateral would branch from the Main Canal and would serve lands in Gypsum Valley.

The Stone Cabin Dam and Reservoir, 12,200 acre-feet capacity, would be constructed on the East Fork of Dry Creek to regulate the return flows from part of the project lands as well as some direct diversions from the San Miguel River conveyed to the reservoir through the Main Canal. The East Paradox Canal and lateral system would divert water from the East Fork of Dry Creek below the Stone Cabin Reservoir to serve lands in East



Paradox Valley. The project would provide water for 33,000 acres of new land and for 10,000 acres of land now inadequately irrigated.

The proposed plan of development is outlined in a status report dated March, 1953. Some detailed work has been accomplished on reservoir and dam-site topography and geologic explorations at the dam site. Most aspects of the investigations have been completed only in reconnaissance scope. The initiation of detailed land classification surveys and topographic surveys for project lands will be of first priority as soon as detailed investigations are resumed.

#### g. Savery-Pot Hook Project

The Savery-Pot Hook Project will provide supplemental water for 13,230 acres of irrigated land and a full supply for 18,380 acres of new land in northwestern Colorado and southern Wyoming. The water would be developed from tributaries of Little Snake River. The 65,000 acre-foot Pot Hook Reservoir would be located on Slater Creek in Colorado, and the 18,600 acre-foot Savery Reservoir would be located on Savery Creek in Wyoming. Part of the water released from these reservoirs would be distributed by existing canals and ditches diverting from Savery Creek and Little Snake River. One of these, the West Side Canal, would be extended an additional 15.7 miles. The remaining project water would be distributed by two new canals, the 19.2 miles long Dolan Mesa Canal heading on Savery Creek and the 58.2 miles long Pot Hook Canal heading at the Pot Hook Reservoir.

A preliminary draft of the feasibility report was completed in July, 1954 and circulated to the States of Wyoming and Colorado for their informal comments. The State of Wyoming is considering developing the Savery Reservoir portion of the plan as a State undertaking, and is not supporting the plan presented in the Bureau of Reclamation's report for the development of land areas in both States. Further investigations have been suspended pending the determination as to whether the present plan should be recommended to Congress or whether the Colorado portion of the plan should be reported as a separate project.

#### h. Fruit Growers Dam Project Extension

The existing Fruit Growers Reservoir would be enlarged from its present capacity of 4,500 acre-feet to 11,500 acre-feet, and its

water supply would be increased by diversions from the Ward and Surface Creeks through the potential six-mile Tongue Creek Feeder Canal. The area receiving water from the reservoir would be enlarged through construction of the Eckert Pumping Plant and Pump Canal and enlargement and extension of the Circle Ditch. The additional reservoir water would largely replace water now used from other sources including natural flows of Surface Creek and the storage water from existing reservoirs on Grand Mesa. The replaced water would be transferred under exchange agreements to higher lands in the vicinity of Cedaredge, Colorado. The water supply would be sufficient to supplement present inadequate supplies on 2,000 acres of land and to provide a full supply for 1,850 acres.

A preliminary draft of the feasibility report was completed in March, 1953 and sent to the State of Colorado for informal comment. Some concern has arisen as to whether the proposed water exchanges can be worked out and there is some question as to whether the project should go ahead of the proposed Grand Mesa Project. Investigations have been suspended pending crystallization of the State of Colorado's views and recommendations.

## NEW MEXICO

Public Law 485 grants priority for investigations leading to planning reports for two New Mexico projects. It is the policy of the State of New Mexico that investigations and construction of the two projects should proceed concurrently.

### a. Navajo Indian Irrigation Project

The Navajo Irrigation Project will be located in northwestern New Mexico on the south side of the San Juan River in the Farmington-Shiprock area. The first part of this project to be developed will be the Shiprock division, which will provide a total of 1,100 irrigated farm units upon approximately 115,000 acres of land, to support an estimated population of 20,000 Indian people. Water for the irrigation of these lands will come from the San Juan River and will be a part of the water of the Colorado River System allocated to the State of New Mexico under the Upper Colorado River Basin Compact. Additional surveys, investigations and studies are needed to develop the most economical plan of development.



A program for the immediate future includes the preparation of contour maps of the irrigable area by photographic methods, final location surveys of main gravity canals, foundation investigations for major conveyance and control structures, geological investigations of tunnel sites, preliminary design studies, and estimates of main gravity canal sections, conveyance and control structures.

Although this project is part of the Colorado River Storage Project and is dependent upon the Navajo Dam for a firm water supply, Public Law 485 specifies that irrigation costs of the Navajo participating project beyond the capability of the land to repay shall be non-reimbursable, and that irrigation costs within the capability of the land to repay shall be deferred so long as the lands remain in Indian ownership. Detailed investigations, necessary exchanges of lands in public ownership for Indian lands and advanced planning of the Navajo Irrigation Project should be completed soon.

#### b. San Juan-Chama Project

This project will be located in south-central Colorado and north-central New Mexico in the San Juan, Rio Grande and Canadian River Basins. Water will be diverted from the headwaters of the San Juan River into the Rio Grande Basin for the purpose of providing supplemental water for existing irrigation projects and for municipal and industrial uses in the Albuquerque metropolitan area. Although water for diversion would be collected from the tributaries of the San Juan River located in both Colorado and New Mexico, all of the water would be used in New Mexico in the Rio Grande Basin. By exchange, the project would also increase the water supply of the Canadian River Basin in New Mexico. The ultimate plan provides for a trans-mountain diversion of 235,000 acre-feet of Colorado River Basin water annually. In addition, the project would improve conditions for recreation, fish and wildlife in the Rio Grande Basin. Detailed investigations of the San Juan-Chama Project should be completed in the near future. Project reports for this project and the Navajo Irrigation Project, mentioned above, will be submitted simultaneously to interested States under the terms of the 1944 Flood Control Act.

## WYOMING

### a. Savery-Pot Hook Project

This project is situated in both Colorado and Wyoming. For information concerning it, see g. under **Projects Being Investigated For Feasibility Reports — COLORADO.**

### 3. Participating Projects In Reconnaissance Stage Of Investigations

Detailed investigations have been undertaken by the Bureau of Reclamation only on the priority projects mentioned above. Investigations of the following projects are in the reconnaissance stage. For some of them, work toward a feasibility report must await the accumulation of the necessary stream-gaging records, or the providing of adequate funds and personnel.

## COLORADO

### a. Parshall Project

The Ute Park Dam will be constructed on the Williams River above its junction with Keyser Creek. A structure 191 feet above streambed would create a reservoir with a capacity of 43,000 acre-feet. The Skylark Canal would extend 45 miles from the reservoir outlet, serving lands on the west side of the Williams River Valley, and the east side of the lower Blue River Valley. The Sylvan Canal would also head at the reservoir outlet and would continue northward 17 miles serving lands on the east side of Williams River Valley and in Little Muddy Creek Valley. The existing Big Lake Ditch would be enlarged and extended. The project would provide water to 24,410 acres of new land and supplemental water to 3,100 acres presently irrigated.

The proposed development for the Parshall Project is in competition with the City and County of Denver's plan to enlarge Williams Fork Reservoir for replacement storage and power purposes.



Detailed investigations on the Parshall Project were suspended when the water-right controversy developed over Williams Fork Reservoir. If Denver goes ahead with the present enlargement as planned, water supplies for the Parshall Project will be severely reduced.

#### b. Bluestone Project

The Bluestone Project would divert water from the Colorado River to irrigate 8,660 acres of new land and 2,215 acres now partially irrigated. The lands comprise a narrow strip along the Colorado River between Rifle, Colorado, and the head of DeBeque Canyon just below the town of DeBeque. The plan includes the restitution, enlargement and extension of the presently abandoned Havermeyer Canal and the rehabilitation of the presently existing Bluestone Ditch. A diversion dam would be constructed at the head of each canal. The Webster Hill Pumping Plant and the Monument Lateral, 30 miles in length, would extend the service area of the Havermeyer Canal. If the proposed DeBeque Reservoir downstream on the Colorado River were to be constructed, its backwaters would inundate or make infeasible development of a large part of Bluestone Project lands.

The Colorado River Water Conservation District of Western Colorado is currently planning the Red Cliff Project which would, in reality, be a division of the Bluestone Irrigation Project. It would include a power generating installation and a storage reservoir.

Power revenues derived from the sale of power would be used to aid in repayment of the Bluestone Irrigation Project. Stored water from the reservoir would be utilized to firm the water supply.

#### c. Troublesome Project

The Hay Park Reservoir, 20,100 acre-feet capacity, would be formed on the East Fork of Troublesome Creek by the Hay Park Dam, 143 feet high. The six-mile long Hay Park Canal would convey released storage water to the main stem of Troublesome Creek, from which it would be distributed for irrigation by the existing Kurtz No. 2 Ditch, which would be enlarged and extended. A second source of project water would be provided by the existing Williams Reservoir on Williams River. The 25-mile long

Kremmling Canal would be constructed to extend from the Williams Reservoir northwest to the lower project lands. It would include a siphon across the Colorado River. The project would provide water to 8,990 acres of new land and to 4,650 acres now irrigated with an inadequate water supply.

#### d. Rabbit Ear Project

Flows of Muddy Creek, a tributary of the Colorado River would be regulated by the 22,500 acre-foot DeBerard Reservoir that would be formed by a dam 86 feet high. The reservoir would be located about 22 miles northwest of Kremmling, Colorado. From the reservoir outlet, irrigation canals would extend southward on each side of Muddy Creek Valley. The DeBerard Canal on the west side would be 28 miles long and the Gunsight Canal on the east side would be 38 miles long. Water would be provided for 13,955 acres of new land and 5,235 acres now partially irrigated.

#### e. Eagle Divide Project

The existing Piney Lake on the headwaters of Piney River, a tributary of the Colorado River, would be enlarged into the Red Sandstone Reservoir to a capacity of 12,800 acre-feet by construction of the Red Sandstone Dam immediately below the existing lake to a height of 77 feet. The Catamount Canal would head on Piney River below the reservoir and would extend westward 32 miles. It would serve lands on the south side of Piney and Colorado Rivers on both sides of the divide between the Eagle and Colorado Rivers. The canal would also divert and deliver to project lands surplus flows of several small north-flowing streams that would be crossed by the canal. The Willow Creek Lateral would branch from the Catamount Canal and convey water southward to lands along Willow Creek and Alkali Creek. The project would provide water to 8,990 acres of new land and 1,885 acres now irrigated with an inadequate water supply.

#### f. Battlement Mesa Project

Battlement Mesa Project would utilize surplus flow of Buzard Creek, a tributary of Plateau Creek in the main Colorado River drainage, as well as surplus flows of Dyke Creek and West Muddy Creek in the Gunnison River drainage. Water from all of these sources would be regulated in Owens Creek Reservoir, 25,000 acre-feet capacity, that would be formed by a dam 149 feet high



on Buzzard Creek just below the stream's junction with Owens Creek. The Gunnison Basin water would be brought to the headwaters of Buzzard Creek by the 7.4 miles long Dyke Creek Feeder Canal. Water released from Owens Creek Reservoir would be diverted from Buzzard Creek into the Colorado Canal, 16.3 miles long, that would serve project lands located along the north side of Plateau Creek near Collbran and Molina, Colorado. About 6,780 acres of new land and 50 acres needing supplemental water would be irrigated.

#### g. Tomichi Creek Project

This project would provide supplemental irrigation water for 15,400 acres of presently irrigated land and a full supply for 12,180 acres of new land located east of Gunnison, Colorado, near the Continental Divide. The Monarch and Ohio City Reservoirs, each with a capacity of 30,000 acre-feet, would be provided by means of dams on Tomichi and Quartz Creeks, respectively. The South Crookton Canal would head at Monarch Reservoir and extend westerly 28 miles to irrigate lands south of Tomichi Creek. The Quartz Creek Canal, also 28 miles long, would extend southeasterly from the Ohio City Reservoir, irrigating lands along Quartz Creek and the north side of Tomichi Creek.

#### h. East River Project

The East River Project would provide irrigation water to 1,780 acres of new land and 970 acres of presently irrigated land in need of additional water. The lands are located between East and Slate Rivers near Crested Butte, Colorado. The water would be made available through construction of the five-mile long East River Canal which would divert from East River, one of the upper tributaries of the Gunnison River. No storage would be required to provide an adequate water supply for project lands.

#### i. Ohio Creek Project

The Castleton Reservoir would be constructed to a capacity of 10,000 acre-feet on Castle Creek, a tributary of Ohio Creek. The potential Ohio Creek Canal would head on Ohio Creek and extend 18 miles to project lands located along the west side of Ohio Creek. The canal would receive released storage water from the Castleton Reservoir through a short canal diverting from

Castle Creek below the reservoir. The service area would include 6,200 acres of new land and 10,710 acres now irrigated with an inadequate supply.

j. Grand Mesa Project

The Grand Mesa Project would provide irrigation water to 11,070 acres of new land and 14,230 acres of irrigated land in need of supplemental water. The lands are located on the south slope of Grand Mesa in western Colorado between Leroux Creek and Dirty George Creek. Lands within the service areas of the Paonia and Fruit Growers Extension Projects are not included. The principal project storage would be at the Paonia Reservoir site on Muddy Creek. Should that site be developed to a capacity of 21,000 acre-feet for the Paonia Project, enlargement to a total capacity of 85,000 acre-feet would be made for the Grand Mesa Project. A 3½-mile feeder canal would divert additional water to the reservoir from Anthracite Creek. Cedaredge Canal would extend from the Paonia Reservoir westerly 67 miles to serve project lands. The Redlands Mesa pumping plant to be constructed on the canal near the Leroux Creek crossing would deliver water to lands above the canal in the Redlands Mesa area. The potential 4,000 acre-foot Gorsuch Reservoir would be located at the point where the Cedar-edge Canal crosses Currant Creek and would regulate the flows of both for use on lands served by the lower 12 miles of the canal.

k. Dallas Creek Project

Surplus flows of Uncompahgre River and two of its tributaries, Dallas Creek and Cow Creek, would be utilized to provide irrigation water to 15,750 acres of new land and 6,190 acres partially irrigated located in the vicinity of Ridgway and Colona, Colorado. The 5,000 acre-foot Willow Swamp Reservoir would be constructed on East Dallas Creek and the 11,200 acre-foot Dallas Divide Reservoir would be constructed on Pleasant Valley Creek, a tributary of Dallas Creek. The Dallas Feeder Canal would head on Beaver Creek, also a tributary of Dallas Creek, and would extend four miles to Willow Swamp Reservoir. A lower section of the canal would head at Willow Swamp Reservoir and extend 16 miles to Dallas Divide Reservoir, intercepting flows of streams along its course. The 19-mile Log Hill Mesa Canal would extend from Dallas Divide Reservoir to lands on Log Hill Mesa. Water from Willow Swamp Reservoir would be largely released to East Dallas Creek to supply existing canals diverting downstream, but some of the water would be released through the Dallas Feeder Canal to Willow Swamp Reservoir. Since



part of the water that would be used under the system above described is presently used under Uncompahgre River diversions, replacement water would be provided from Ramshorn Reservoir that would be constructed on Cow Creek.

#### 1. Yellow Jacket Project

The Yellow Jacket Project would provide irrigation water for 36,907 acres of new land and for 4,204 acres that now lack a full irrigation supply. Surplus flows of White River would be stored in Trappers Lake, 23,600 acre-feet capacity, formed by a dam 65 feet high above the present natural lake. Releases from this reservoir would flow 18 miles in White River to the head of the potential Yellow Jacket Canal. The canal would also receive water from Ute Creek, a White River tributary, through a short feeder canal. The Yellow Jacket Canal, 31.2 miles long, would convey water to the Yellow Jacket area and then through Yellow Jacket Pass to the Milk Creek drainage. During the irrigation season releases would be made to Little Beaver and Coal Creeks and to lands between the two creeks. Most of the water released to Little Beaver Creek would be diverted into the potential Josephine Basin Canal, 45.4 miles long, and conveyed to lands on the south side of the Little Beaver drainage and to lands in the Josephine Basin area. The remainder of the releases to Little Beaver Creek would be diverted for use on lands along the stream channel. Some of the water released to Coal Creek would be used on lands adjoining the stream and the remainder would be diverted into the potential 12-mile long Coal Creek Canal and conveyed to lands west of Coal Creek.

Water delivered by the Yellow Jacket Canal to Milk Creek would be regulated along with flows of the creek at the potential Thornburgh Reservoir, 31,500 acre-feet capacity, formed by a dam 118 feet high. Water from the reservoir would be released to the 38-mile Axial Basin Canal and conveyed to lands along the southern side of the Axial Basin area east of Milk Creek.

### UTAH

#### a. Gooseberry Project

The Gooseberry Project would divert water from Gooseberry Creek in the Colorado River Basin to improve the irrigation supply for 16,400 acres of land in the Bonneville Basin in Sanpete County

in central Utah. Flows of Gooseberry Creek would be regulated in the Mammoth Reservoir of 17,200 acre-feet capacity. A 2.4-mile outlet tunnel from the reservoir would convey released storage water through the divide to Cottonwood Creek in the Bonneville Basin. The water would be diverted from Cottonwood Creek into existing canals which would be rehabilitated as necessary and to the potential Gooseberry Highline Canal for conveyance to project lands. Drains would be provided as needed.

Feasibility studies are needed for this project. Investigations are progressing. A definite plan report is expected to be completed by June, 1959.

## WYOMING

### a. Sublette Project

The potential Sublette Project is planned to store and divert waters of the upper Green River and its tributaries to supply irrigation water for about 72,000 acres of undeveloped lands and 12,000 acres of lands presently irrigated with an inadequate supply. The plan also includes a small hydroelectric power plant. The project would be located in the Green River Basin in Sublette County, western Wyoming. Reconnaissance studies indicate that the project would consist of two independent divisions (Buckskin and West Side).

With project development the irrigated lands would be utilized largely for the support of livestock enterprises as now practiced in the area. Climatically adapted crops such as hay, pasture, and small grains would be produced. Livestock would be primarily beef cattle and sheep.

Preliminary land classification surveys indicate that the lands would be suitable for sustained crop production under irrigation farming. A detailed land classification has been made for part of the area. Completion of detailed classification would be necessary to confirm the suitability of all lands.

Studies of streamflow records and simulated project operations indicate that an adequate irrigation supply would be available with moderate shortages in occasional drought years. The total increase in irrigation water supply would approximate 268,000 acre-feet



annually from direct flow and storage yield. Water rights could probably be obtained under Wyoming State law.

Principal construction features would include Kendall Dam and Reservoir, Fremont Lake Reservoir, Burnt Lake Reservoir, and Boulder Lake Dam and Reservoir to provide storage capacities of 162,000, 64,000, 30,000, and 165,000 acre-feet, respectively. A system of main canals, laterals, and drains and a 2,200-kilowatt power plant would also be included.

This statement is based on a physical plan of project development formulated by the Bureau of Reclamation during the course of reconnaissance investigations.

There has been a report of reconnaissance nature made for this project. Investigations are progressing but cannot be completed until after work on other Wyoming participating projects is finished due to limitations of manpower and funds.



## **IX. GOVERNORS' CONFERENCE**

On December 21, 1956 at the invitation of Governor Simpson of Wyoming, Governor Simpson and Governors-elect McNichols of Colorado, Clyde of Utah, and Mechem of New Mexico, met in Cheyenne, Wyoming, for a discussion of problems related to the development of the water and land resources of the Upper Division States of the Colorado River Basin.

Their intense interest and their unanimity of agreement on fundamental issues can best be portrayed by their joint statement printed below:

### **STATEMENT OF GOVERNORS OF FOUR UPPER COLORADO RIVER BASIN STATES**

Cheyenne, Wyoming

December 21, 1956

Governor Milward L. Simpson of Wyoming and Governors-elect McNichols of Colorado, Clyde of Utah, and Mechem of New Mexico met in the State Capitol today at the invitation of Governor Simpson.

They being fully cognizant of the tremendous importance of the recently authorized Upper Colorado River Storage Project to the future economic growth of these States, have met to unite their respective efforts and pledge their support to the end that the entire project can be completed as planned and scheduled. In order to accomplish these purposes, we find the following to be imperative courses of action.

1. To urge and procure adequate appropriations for the following:

- a. Construction of all storage and power facilities on the main stems of the Colorado River system for the purpose of providing (river) regulation and power revenues at the earliest possible date.
- b. The immediate construction of the participating projects necessary to furnish water supplies for irrigation, industrial and domestic uses.



- c. The immediate completion of investigations of all provisionally authorized projects as set forth in Public Law 485, and the completion of planned reports necessary for construction contracts.
- d. To appropriate forthwith the necessary funds to specifically review the agricultural feasibility of the proposed participating projects.

In furtherance of the above, they recognize:

1. The importance of the Upper Colorado River Commission and recommend that its program be continued and accelerated by the reorganization of and additions to its technical staff.
2. The need for development of an adequate public relations program in order to keep our people informed and provide factual and technical data and information to the United States Congress and the appropriate agencies of federal government, to assure the continued support of those bodies for this project, and further to provide an effective liaison between the Congress, the United States Bureau of Reclamation, and the respective states.
3. The necessity of making power available to the Upper Basin power market area on a competitive basis with full recognition of the established rights of the preferential users.

The Governors directed that a copy of this declaration be provided the Members of Congress, the members of the Upper Colorado River Basin Commission, and the appropriate federal agencies.



## **X. *SMALL RECLAMATION PROJECTS***

### **RECENTLY ENACTED LEGISLATION OF INTEREST TO STATES OF THE UPPER COLORADO RIVER BASIN**

#### **Small Reclamation Projects Act of 1956**

On August 6, 1956 the President signed into law the Small Reclamation Projects Act of 1956, Public Law 984, 84th Congress (70 Stat. 1044), which established a program under which certain State and local organizations can obtain loans for the construction of small reclamation projects. This Act also permits grants for those portions of the project that are non-reimbursable as a matter of national policy.

This law should be of major importance to the States of the Upper Colorado River Basin, because in each State there are many projects that are too small to be economically constructed by the Federal Government, but which are too large and too expensive to be constructed and financed privately. The President has stated that Congress shall amend that section of the Act pertaining to the method of approval of the projects before he will approve appropriations of funds for implementing the program. The 85th Congress is currently considering amendatory language to satisfy the President's objection.

In the meanwhile, the Bureau of Reclamation is setting up a program under which interested organizations may prepare their plans and make applications for loans. The Bureau is examining plans and processing applications on acceptable projects so that action thereon can be taken relatively quickly after the final amendments have been made by Congress and the funds are made available.

Under the terms of the Act, a Small Project may take either of two forms. It may be a complete irrigation undertaking or a distinct unit of such an undertaking, and is similar to what might be constructed by the Bureau of Reclamation under Federal Reclamation Laws, the total cost of which does not exceed five million dollars, or it may be a rehabilitation and betterment program for an existing irrigation development, the cost of each project not to exceed five million dollars. The legislation provides that a project costing up to ten million dollars may qualify providing that the local organization will finance all costs above the amount that



would be required if the estimated cost did not exceed five million dollars. The latter figure is the limit of the loan or a combination of loan and nonreimbursable grant. Nonreimbursable grants may be made for flood control, fish and wildlife benefits, navigation and sediment retention, where these are of general public benefit.

Only those organizations may apply for loans under the terms of Public Law 984 which qualify as "a State or a Department, Agency or Political Subdivision thereof, or a Conservancy District, Irrigation District, Water User's Association, an agency created by inter-state compact, or a similar organization which has capacity to contract with the United States under the Federal Reclamation Laws." The Law specifically prohibits more than one loan or grant, or combination of these, for one project.

An organization cannot obtain several separate loans for a single project. Also, no more than one organization may obtain a loan for the same project. An organization submitting a project proposal to the Secretary of the Interior under the Small Reclamation Projects Act must accompany its proposal with a check for \$1,000 to cover a part of the cost of the review and processing of the application. Loans are limited to irrigation projects or projects in which irrigation is the major purpose. Incidental purposes may include power, domestic, industrial or municipal water supply as well as Federally recognized nonreimbursable functions incidental to the principal purpose of the project.

In accordance with Reclamation law, irrigation costs are interest free, excepting that interest must be charged on any acreage in excess of 160 acres in a single ownership, on the production of commercial power, and on water furnished for domestic, industrial or municipal uses. The rate of interest to be paid on such loans is based upon the long-term cost of money to the United States. The rate will be determined each year by the Secretary of the Treasury and will apply to all contracts executed during that fiscal year.

The repayment period for loans cannot exceed fifty years. The actual payout schedule for a specific project will be dictated by the conditions anticipated and will be decided between the Bureau of Reclamation and the applicant organization. Applicants must enter into a contract with the United States which will provide for the repayment of the loan and which will cover various arrangements for the design and construction, operation and maintenance of the project, and the repayment of the Bureau of Reclamation costs.



Public Law 984 requires that the local interests finance, by means other than the Federal loan and grant, a part of the construction cost of the project up to but not exceeding 25% of the reimbursable cost of the project, for those projects costing no more than five million dollars. For projects that cost more than that amount, the local interests must pay all costs above five million dollars and must make the contribution that they would if the project cost five million dollars. The Law specified that the local interest must provide as a part of this contribution all costs of the lands, interests in lands, and all water rights.

For rehabilitation and betterment work on existing projects, the amount of the contribution must be considered on an individual case basis to provide for the local share of the costs consistent with the requirements placed upon new projects.

Expenses incurred by the organization preparatory to applying for a loan cannot be considered as a part of the contribution to the cost of construction. The applicant organization is responsible for the planning, building, operation and maintenance of the project. It must make its own arrangements for the necessary engineering consulting services and other specialized services that it may need.

The Bureau of Reclamation, upon request, will advise and assist the applicants to the extent required. In the event that an applicant finds it impossible to obtain the necessary specialized services, the Bureau will provide such services whenever it can do so if the applicant pays for them. Certain types of information relative to a proposed project which the Bureau of Reclamation may have in its files are available to an organization at cost.

The Small Reclamation Projects Act specifically requires that the applicant consult with the Fish and Wildlife Service and the appropriate Fish and Game Agencies during the planning of the irrigation project to prevent unnecessary damages to fish or wildlife values of the area. The Law also provides a nonreimbursable grant for projects benefiting fish and wildlife. If nonreimbursable grants are requested for other purposes, the applicant must also consult with the appropriate Federal Agencies with primary interests in those activities.

It will also be necessary for agreement to be reached between the applicant, the other Federal Agencies, and the Bureau of Reclamation on the manner of operation of the project in order to assure the claimed benefits.



The applicant must submit proposals for the project for review by the State or States in which the project is located, and the Governor of the State involved must find that the project is feasible. Also, reports on the project, except those for rehabilitation and betterment programs on existing projects, must be submitted to the other States of the river basin for review.



## XI. LEGAL

At the present time the organization of the Upper Colorado River Commission does not include a legal department. The Legal Committee is composed of legal advisers to the Commissioners from the respective States. The legal adviser to a Commissioner from a given State is employed by and is responsible to that State. The Chairman, who is a representative of the Federal Government, has his own legal advisers whose services are furnished by the United States. In some instances the legal adviser to a Commissioner is the Attorney General of his State. In other cases the legal adviser is a special attorney employed by the State. Therefore, the personnel of the Legal Committee of the Upper Colorado River Commission changes from time to time.

In accordance with the By-Laws of the Commission the Engineer-Secretary is an ex-officio member of the Legal Committee.

During the past year the Commission authorized the Assistant General Counsel of the Navajo Tribal Council to sit with the Legal Committee to consider various matters that were referred to it by the Commission. This arrangement has insured the unified action on the part of the legal advisers in accomplishing the policies determined and established by the Commission in connection with legislation and litigation. In the past, this plan has worked very well; although the Commission at various times has considered the advisability of establishing a legal section to act for the Commission as such.

During the past year the members of the Legal Committee have worked in close cooperation with one another in keeping in touch with litigation pending in the Supreme Court between Arizona and California involving the use of waters of the Colorado River.

While the legislation was pending in the Congress to authorize the Colorado River Storage Project and participating projects, the States, through their Legal Departments, were unanimous in the decision that the four Upper Division States should resist the efforts of California to implead them as parties in *Arizona v. California*. The Commission directed its legal advisers to take whatever action was deemed necessary to resist the motion of California to implead the four Upper Division States. This directive was carried out. Through unified action and cooperation, briefs were filed in the Supreme Court by each State. After oral arguments the Supreme Court held that the Upper Division States were not neces-



sary or indispensable parties, and the case was ordered to proceed without them. Two of the States, New Mexico and Utah, were impleaded as parties only with respect to their interests in the allocation of the beneficial consumptive use of waters apportioned to the Lower Basin.

The Chairman of the Legal Committee on several occasions has suggested to the Commission that there are certain issues being raised in *Arizona v. California*, or certain contentions made by the parties thereto which should be closely studied by the Commission and the Legal Departments of its member-States.

There were no other matters referred to the Legal Committee since the date of the last Annual Report which required formal action.



## *XII. FINDINGS OF FACT*

No findings of fact pursuant to Article VIII of the Upper Colorado River Basin Compact have been made by the Upper Colorado River Commission. No part of this Annual Report, or the information contained herein, is to be construed as findings of fact by the Commission.





# APPENDIX A

## BUDGET

Fiscal Year Ending June 30, 1958

### PERSONAL SERVICES

Administrative Salaries	\$17,000.00	
Engineering Salaries	22,500.00	
Clerk-Stenographer	<u>3,000.00</u>	\$42,500.00

### CURRENT EXPENSE

Social Security	500.00	
Rent and Janitor service	3,355.00	
Assistant Treasurer	300.00	
Accounting, Legal Services, Reporting	2,800.00	
Telephone and Telegraph	1,200.00	
Insurance and Bond Premiums	850.00	
Printing	1,900.00	
Engineering Services, aerial photos, maps, etc.	3,500.00	
Miscellaneous	<u>825.00</u>	15,230.00

CAPITAL OUTLAY 700.00

INFORMATION 7,500.00

TRAVEL 6,500.00

OFFICE SUPPLIES AND POSTAGE 2,570.00

### TOTAL ESTIMATED EXPENSE

Fiscal Year July 1, 1957 through June 30, 1958 \$75,000.00

*APPENDIX B*

**REPORT OF EXAMINATION  
UPPER COLORADO RIVER COMMISSION  
GRAND JUNCTION, COLORADO  
June 30, 1956**



## *Appendix B (Cont'd)*

Dalby & McNulty  
Certified Public Accountants  
First National Bank Building  
Grand Junction, Colorado  
August 21, 1956

Walter E. Dalby, C.P.A.  
John E. McNulty, C.P.A.

Upper Colorado River Commission  
Grand Junction, Colorado

We have examined the balance sheets of the General Fund and the Property and Equipment Fund of the Upper Colorado River Commission as of June 30, 1956, and the related statement of revenue and expense for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the accompanying balance sheets and revenue and expense statement present fairly the financial position of the Upper Colorado River Commission at June 30, 1956, and the results of its operations for the year then ended.

/s/ Dalby & McNulty

Certified Public Accountants

## *Appendix B (Cont'd)*

### BALANCE SHEET — GENERAL FUND

#### UPPER COLORADO RIVER COMMISSION

June 30, 1956

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#### ASSETS

##### CASH

Office cash fund	\$ 25.00	
Demand deposit	<u>23,487.38</u>	\$23,512.38

##### ASSESSMENT RECEIVABLE —

State of Colorado		336.54
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##### RETURNABLE DEPOSIT —

United Air Lines		425.00
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PREPAID RENT — Monte Building		<u>239.50</u>
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\$24,513.42

#### LIABILITIES AND FUND BALANCE

##### ACCOUNTS PAYABLE —

for supplies and expenses		\$ 162.41
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##### WITHHOLDING TAXES PAYABLE —

State of Colorado		60.89
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##### UNAPPROPRIATED FUND BALANCE

Balance at July 1, 1955	\$ 7,717.81	
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Add — excess of revenues over  
expenditures for the fiscal  
year ended June 30, 1956

22,572.31

\$30,290.12

Less — appropriation for expenses  
for fiscal year ended

June 30, 1956

6,000.00

24,290.12

\$24,513.42

Note — The accompanying notes to financial statements are  
an integral part of this balance sheet.



## *Appendix B (Cont'd)*

### BALANCE SHEET — PROPERTY AND EQUIPMENT FUND

#### UPPER COLORADO RIVER COMMISSION

June 30, 1956

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#### ASSETS

Property and equipment — at cost:

Furniture and fixtures	\$ 8,047.44
Automobile	2,460.81
Engineering equipment	1,533.65
Motion picture film	2.00
Upper Colorado basin relief model	5,501.60
	<u>\$17,545.50</u>

#### FUND BALANCE

Investment in property and equipment

July 1, 1955 \$21,244.16

Transactions for fiscal year ended

June 30, 1956:

Additions	\$ 7,606.85	
Retirements	<u>11,305.51</u>	<u>(3,698.66)</u>

Investment in property and equipment at

June 30, 1956 \$17,545.50

\$17,545.50

Note — The accompanying notes to financial statements are an integral part of this balance sheet.

## *Appendix B (Cont'd)*

### CONDENSED STATEMENT OF REVENUE AND EXPENSE

#### UPPER COLORADO RIVER COMMISSION

For the fiscal year ended June 30, 1956

	Budget Amount (As Revised May 17, 1956)	Actual Amount	Actual Amount Over-under*
Revenue:			
Assessments	\$74,625.20	\$74,625.20	\$ —0—
Sale of reports	—0—	23.00	23.00
Appropriated from general fund balance	6,000.00	6,000.00	—0—
<b>TOTAL REVENUE</b>	<u>\$80,625.20</u>	<u>\$80,648.20</u>	<u>\$ 23.00</u>
Expense:			
Personal services	\$23,250.00	\$22,766.39	\$ 483.61*
Capital outlay	4,510.00	2,019.25	2,490.75*
Office supplies and postage —			
Grand Junction office	1,800.00	1,671.56	128.44*
Information and education —			
Washington, D. C. office	8,585.00	8,137.79	447.21*
General publicity	12,120.00	11,709.55	410.45*
Travel	3,100.00	2,992.87	107.13*
Current expenses	10,330.50	8,778.48	1,552.02*
<b>TOTAL EXPENSE</b>	<u>\$63,695.50</u>	<u>\$58,075.89</u>	<u>\$5,619.61*</u>
Unappropriated Balance And Excess Of Actual Revenue Over Actual Expense	<u>\$16,929.70</u>	<u>\$22,572.31</u>	<u>\$5,642.61</u>
	<u>\$80,625.20</u>		

Note — The accompanying notes to financial statements are an integral part of this statement.



## *Appendix B (Cont'd)*

### NOTES TO FINANCIAL STATEMENTS

#### UPPER COLORADO RIVER COMMISSION

June 30, 1956

Note A—In June, 1956, the Commission appropriated the sum of \$1,231.60 from unappropriated fund balance as of June 30, 1956. The appropriation is added to the budget for fiscal year ended June 30, 1957, and arises from failure of several of the states to pay the entire amount of the annual assessments to the Commission. The details of the underpayments follow:

State	Assessment For Fiscal Year Ended	Amount		
		Assessed	Paid	Due Commission
Colorado	June 30, 1956	\$38,618.54	\$38,282.00	\$336.54
Wyoming	June 30, 1957	\$10,447.53	\$ 9,552.47	\$895.06

In the event that the two states concerned do not make payment to the Commission of the balances due, the Commission may find it necessary to further revise its budget in order to provide for refund payments affecting both fiscal years. The Controller of the State of Colorado did not acknowledge the balance of \$336.54 due the Commission as of June 30, 1956.

Note B—Motion picture film owned by the Commission and produced at a cost of \$14,009.10, were considered obsolete at June 30, 1956, and have been reduced to a nominal value of \$2.00 on the balance sheet of the Property and Equipment Fund as of that date.

## *Appendix B (Cont'd)*

### NOTES OF FINANCIAL STATEMENTS

#### UPPER COLORADO RIVER COMMISSION

June 30, 1956

Note C—At June 30, 1956, unrecorded liability of the Commission to its full-time employees for accrued annual leave pay amounted to \$520.15. According to Commission policy, each employee is expected to take annual leave of twenty-four days each calendar year (not necessarily consecutive) during which period of time regular salary payments are continued. The unused portions of annual leave are not carried forward from year to year.

Note D—Expense of moving the Grand Junction, Colorado office of the Commission as shown on the accompanying Statement of Revenue and Expense in the amount of \$1,057.27, includes cost of building partitions (\$822.54) and cost of installing additional electric outlets (\$99.48) in new office.

Note E—The Commission has made several advance payments as of June 30, 1956. The details of these payments follow:

<u>PAYEE</u>	<u>AMOUNT</u>	<u>FOR</u>
International Business Machines Corporation	\$618.50	New electric typewriter. Delivered to Commission in July, 1956.
Mr. F. C. Merriell — Water engineer	\$125.00	Maps—not delivered to Commission as of August 21, 1956.





## *Appendix B (Cont'd)*

### CASH RECEIPTS AND DISBURSEMENTS

#### UPPER COLORADO RIVER COMMISSION

For the fiscal year ended June 30, 1956

Balance of cash and demand deposit at July 1, 1955			\$16,065.46
Cash receipts:			
Assessments	\$74,625.20		
Less:			
Balance of assessment due from State of Colorado at June 30, 1956	\$ 336.54		
New Mexico assessment received prior to July 1, 1955	8,395.34	8,731.88	
		\$65,893.32	
Sale of reports		23.00	65,916.32
			\$81,981.78
Cash disbursements:			
Personal services	\$22,705.50		
Travel	2,868.40		
Current expenses	8,980.04		
Capital outlay	2,019.25		
Information	19,547.34		
Office supplies	1,671.56		
Expenses of fiscal year ended June 30, 1955 not paid until after July 1, 1955		677.31	58,469.40
Balance of cash and demand deposit at June 30, 1956			\$23,512.38

## *Appendix B (Cont'd)*

### INSURANCE COVERAGE

#### UPPER COLORADO RIVER COMMISSION

June 30, 1956

	<u>Type of Coverage</u>	<u>Amount of Coverage</u>
Furniture and fixtures	Fire and comprehensive	\$7,500.00
Automobile	Comprehensive	Actual cash value
	Collision and upset	\$100.00 deductible
	Bodily injury and property damage	\$5/100,000.00
Treasurer	Fidelity bond	\$40,000.00
Assistant Treasurer	Fidelity bond	\$40,000.00
Employees	Workmen's compensation	Various





**APPENDIX C**  
**CONSTRUCTION CONTRACT AWARDS**  
for  
**Units of Colorado River Storage Project**  
**(Through January 1957)**

Feature, Schedule or Description of the work	Spec. No.	Name of Contractor	Low Bid	Engineer's Estimate	Date of Award	Scheduled Completion Date
<b>GLEN CANYON UNIT</b>						
Earthwork and Culverts, Access Highway, Station 158+67.7 to Station 400+00 (High- way along east side of the Colorado River)	DC-4730	Strong Co. Springville, Utah	\$1,156,244	\$1,014,633	9-21-56	7-1-57
Exploratory Drilling and Water Testing at Glen Canyon Dam Site	400C-63	Cannon Diamond Drilling Co., Compton, Calif.	148,185	172,820	8-14-56	12-27-56
Glen Canyon Dam Right Diversion Tunnel	DC-4747	Mountain States Const. Co., Denver, Colorado	2,452,340	3,845,100	10-1-56	12-26-57
Earthwork and Culverts, Access Highway, Station 400+00 to Station 1497+50 and Waterholes Canyon Bridge	DC-4756	W. W. Clyde & Co. Springville, Utah	1,011,819	832,663	10-20-56	7-3-57
Completion of Gravel Surfacing, Arizona- Utah State Line to Glen Canyon Dam Site and Wahweap Creek Road	400C-68	Ford-Fielding, Inc. Provo, Utah	36,801	73,220	11-8-56	2-7-57
Colorado River Bridge, Glen Canyon Dam	DC-4800	Kiewit-Judson Pacific Murphy, 4322 Eastshore Drive, Emoryville, Calif.	4,139,277	2,944,750	1-21-57	1/ 2-17-59 6-17-59

1/ Entire bridge, exclusive of painting  
below concrete bridge deck

*Appendix C (Cont'd)*  
**CONSTRUCTION CONTRACT AWARDS**  
 for  
**Units of Colorado River Storage Project**  
**(Through January 1957)**

Feature, Schedule or Description of the Work	Spec. No.	Name of Contractor	Low Bid	Engineer's Estimate	Date of Award	Scheduled Completion Date
<b>FLAMING GORGE UNIT</b>						
Earthwork, Structures, Bridge, and Sur- facing Temporary Access Road to Flaming Gorge Dam, Station 0+00 to Station 402+00	DC-4779	Wangsgaard Const. Co., Logan, Utah	143,912	171,342	1-4-57	7-15-57



## *Appendix C (Cont'd)*

### **COLORADO RIVER STORAGE PROJECT**

#### **Construction Contracts Scheduled for Bidding February — April 1957**

##### **GLEN CANYON UNIT**

1. Dam, tunnel, and powerplant — Constructing Glen Canyon Dam, Tunnel, and Powerplant.
2. Water Tanks, Glen Canyon Community Facilities — Furnishing and erecting one 150,000-gallon elevated steel water tank with minimum water surface 65 feet above footings and one 3,000,000-gallon standard steel reservoir.
3. Residence foundations — Grading sites and constructing foundations for 50 portable houses.
4. Gas Distribution System, Glen Canyon Community Area — Constructing a liquified petroleum gas distribution system with buried pipe and branch shut-offs, with piping being buried in the same trenches as the water supply lines.
5. Sewage Treatment Plant, Glen Canyon Community — Constructing a sewage treatment plant, including a comminutor, a 30-foot-diameter clarifier, a 35-foot-diameter digester, and a control building for gas and steam equipment, and stabilization ponds.
6. Highway Surfacing — Constructing base course and bituminous surfacing for 25 miles of access highway from Bitter Springs to Glen Canyon Dam Site.
7. Community Facilities — Constructing about 290 residences and facilities for a 2,000-person community at Glen Canyon. Work will include streets, water and sewer main.

## FLAMING GORGE UNIT

1. Warehouse — Furnishing and erecting a one-story steel building, about 70 feet wide and 200 feet long with structural steel rigid frame bents, and installing one 25-ton overhead traveling crane.
2. Diversion tunnel — Excavating in open cut and in tunnel for the 1,350-foot-long, 26-foot-diameter unlined right abutment diversion tunnel at the Flaming Gorge Dam Site.
3. Access Road — Constructing second of three portions of access road to the left abutment of Flaming Gorge Dam.
4. Community Facilities — Constructing about 90 residences and facilities, including streets, sewage collection system and water distribution system, for a community of 1,000 people.





## APPENDIX D

### UPPER COLORADO RIVER COMMISSION

#### Key Gaging Stations

Derived from reports of U. S. Geological Survey and others.

Ref. (1)	Streams (2)	Drainage Area Sq. Miles (3)	Discharge during Water Year in 1,000 acre-ft. Units (Provisional)		
			1954 (4)	1955 (5)	1956 (6)
1.	Animas River near Cedar Hill, N. M.	1,092	426.8	464.0	431.1
2.	Animas River at Durango, Colorado	692	364.0	409.7	378.6
3.	Animas River at Farmington, N. M.	1,360	376.5	412.6	365.1
4.	Arapaho Creek at Monarch Lake Outlet, Colorado	47.1	37.4	50.5	59.1
5.	Ashley Creek near Jensen, Utah	386	16.0	15.6	18.1
6.	Ashley Creek at Sign of the Main, near Vernal, Utah	241	58.6	52.4	69.7
7.	Ashley Creek near Vernal, Utah	101	53.4	49.5	58.3
8.	Big Sandy Creek at Leckie Ranch, Wyo.	94	54.7	46.8	64.8
9.	Blacks Fork near Milburne, Wyo.	156	71.5	86.3	122.2
10.	Blacks Fork near Green River, Wyo.	3,670	67.1	88.1	217.0

## *Appendix D (Cont'd)*

Ref. (1)	Streams (2)	Drainage Area Sq. Miles (3)	Discharge during Water Year in 1,000 acre-ft. Units (Provisional)		
			1954 (4)	1955 (5)	1956 (6)
11.	Blue River at Dillon, Colorado	129	36.0	54.5	70.4
12.	Boulder Creek below Boulder Lake, Wyo.	130	147.9	116.7	
13.	Bloomfield Canal (See Citizens Ditch)				
14.	Brush Creek near Jensen, Utah	255	5.1	4.7	
15.	Brush Creek near Vernal, Utah	82	16.4	14.4	16.4
16.	Burnt Fork near Burnt Fork, Wyo.	53	12.4	15.2	15.3
17.	Carter Creek near Manila, Utah		3.0		
18.	Carter Creek at mouth near Manila, Utah	110	22.3	18.2	
19.	Citizens Ditch (Bloom- field Canal) near Tur- ley, N. M. Diverting water around Blanco gage		79.1	74.2	66.0
20.	*Colorado River near Cameo, Colorado	8,055	1,552.0	1,976.0	2,416.0
21.	Colorado River near Cisco, Utah	24,100	2,329.0	3,241.0	3,604.0
22.	Colo. River near Colo.- Utah State line	20,680	2,086.0	2,903.0	3,345.0
23.	*Colo. River at Glen- wood Springs, Colo.	4,560	885.9	1,026.0	1,469.0
24.	Colorado River near Grand Lake, Colorado	103	23.8	33.3	50.9



## *Appendix D (Cont'd)*

Ref. (1)	Streams (2)	Drainage Area Sq. Miles (3)	Discharge during Water Year in 1,000 acre-ft. Units (Provisional)		
			1954 (4)	1955 (5)	1956 (6)
25.	Colorado River at Hite, Utah	76,600	5,015.0	6,238.0	7,694.0
26.	Colo. River at Hot Sul- phur Springs, Colorado	782	80.4	103.1	142.3
27.	(A) Colo. River at Lee Ferry, Ariz.	@ 109,889	6,116.0	7,307.0	8,750.0
28.	Colorado River at Lees Ferry, Ariz.	@ 108,335	6,101.0	7,290.0	8,740.0
29.	Cottonwood Creek near Orangeville, Utah	200	41.2	43.2	48.8
30.	Crystal River near Redstone, Colorado	225	142.5	213.2	202.6
31.	Dirty Devil River near Hite, Utah		51.4	53.0	
32.	Dolores River near Cisco, Utah		208.5	360.0	270.5
33.	Dolores River at Dolores, Colorado	556	155.6	203.0	197.2
34.	(D) Dolores River at Gateway, Colorado	4,350	203.2		
35.	Duchesne River at Myton, Utah	2,705	148.3	185.4	251.9
36.	Duchesne River near Randlett, Utah	3,820	191.4	247.6	313.5
37.	Duchesne River near Tabiona, Utah	352	77.7	92.2	129.3
38.	Eagle River below Gypsum, Colo.	957	221.1	292.3	391.6
39.	Eagle River at Redcliff, Colorado	72	14.8	16.7	26.0

## *Appendix D (Cont'd)*

Ref. (1)	Streams (2)	Drainage Area Sq. Miles (3)	Discharge during Water Year in 1,000 acre-ft. Units (Provisional)		
			1954 (4)	1955 (5)	1956 (6)
40.	East River at Almont, Colorado	295	126.3	175.8	203.6
41.	East Fork of Smith Fork near Robertson, Wyoming	53	18.4	21.4	29.9
42.	East Fork of Beaver Creek near Lonetree, Wyoming		4.2	4.4	
43.	Elk River at Clark, Colorado	206	135.1	186.8	
44.	Escalante River near Escalante, Utah	315	2.2	2.4	
45.	Escalante River near mouth, Utah		49.6	64.5	
46.	Florida River near Durango, Colorado	96	43.8	42.4	
47.	(D) Fontenelle Creek near Fontenelle, Wyo.	224			
48.	Fontenelle Creek near Herschler Ranch	152	39.8	37.4	66.4
49.	Fraser River near Winter Park, Colo.	27.6	4.3	5.0	7.12
50.	Green River near Greendale, Utah		1,251.0	1,002.0	
51.	Green River at Green River, Utah	40,920	2,618.0	2,839.0	4,058.0
52.	Green River near Green River, Wyo.	7,670	1,179.0	836.0	1,600.0
53.	Green River near Jensen, Utah	**	2,056.0	2,074.0	3,404.0



## *Appendix D (Cont'd)*

Ref. (1)	Streams (2)	Drainage Area Sq. Miles (3)	Discharge during Water Year in 1,000 acre-ft. Units (Provisional)		
			1954 (4)	1955 (5)	1956 (6)
54.	Green River near Linwood, Utah	14,300	1,227.0	932.5	1,853.0
55.	Green River near Ouray, Utah	**	2,665.0	2,818.0	
56.	Green River at Warren Bridge, Wyoming	468	394.1	292.9	482.1
57.	Gunnison River and Redlands Power Canal near Grand Junction, Colorado	8,020	663.5	1,032.0	1,113.0
58.	Gunnison River near Gunnison, Colorado	1,010	283.8	362.6	452.1
59.	Gunnison River below Gunnison Tunnel, Colorado	3,980	217.8	401.4	574.7
60.	Hams Fork near Frontier, Wyo.		61.6	69.2	121.6
61.	Henrys Fork at Linwood, Utah	530	15.6	21.1	31.08
62.	Henrys Fork near Lonetree, Wyoming	55	14.9	19.4	21.32
63.	LaPlata River at Colorado-New Mexico State line	331	6.7	9.4	8.4
63a.	LaPlata River near Farmington, New Mexico			4.3	
64.	LaPlata River at Hesperus, Colorado	37	18.6	20.3	20.05
65.	Little Snake River near Dixon, Wyoming	988	157.2	215.7	303.4

## *Appendix D (Cont'd)*

Ref. (1)	Streams (2)	Drainage Area Sq. Miles (3)	Discharge during Water Year in 1,000 acre-ft. Units (Provisional)		
			1954 (4)	1955 (5)	1956 (6)
66.	Little Snake River near Lily, Colo.	3,730	178.3	233.2	
67.	Little Snake River near Slater, Colo.	285	75.7	114.6	174.0
68.	Los Pinos River near Bayfield, Colo.	284	176.7	192.2	199.1
69.	(C) Los Pinos River at LaBoca, Colorado		64.1	80.4	70.0
70.	Los Pinos River at Ignacio, Colorado	448	43.9	57.8	44.7
71.	Mancos River near Towoac, Colorado	550	10.0	14.2	
72.	McElmo Creek near Colorado-Utah State line		20.8	26.5	
73.	(D) McElmo Creek near Cortez, Colorado	233	22.1		
74.	Middle Fork Beaver Creek near Lonetree, Wyoming		8.6	11.1	
75.	(D) Minnie Maud Creek near Myton, Utah		1.1	1.3	
76.	Navajo River at Edith, Colorado	165	62.5	56.3	
77.	North Fork Gunnison River near Somerset, Colorado	521	142.3	239.8	245.6
78.	North Piney Creek near Mason, Wyoming	58	40.4	28.5	56.6
79.	(A) Paria River at Lees Ferry, Arizona	1,550	15.7	17.7	10.0



## Appendix D (Cont'd)

Ref. (1)	Streams (2)	Drainage Area Sq. Miles (3)	Discharge during Water Year in 1,000 acre-ft. Units (Provisional)		
			1954 (4)	1955 (5)	1956 (6)
80.	#Pine Creek above Fremont Lake, Wyo.			102.2	155.2
81.	(D) Pine Creek at Pinedale, Wyo.	118	90.1		
82.	Plateau Creek near Cameo, Colorado	604	72.3	93.0	
83.	Price River near Heiner, Utah	455	63.4	59.0	61.5
84.	Price River at Woodside, Utah	1,500	52.4	44.4	24.6
85.	Ranch Creek near Fraser, Colo.	19.9	2.9	2.9	4.4
86.	Rio Blanco River near Pagosa Springs, Colorado	58	40.0	37.8	
87.	Roaring Fork at Aspen, Colorado	109	32.6	43.5	43.8
88.	Roaring Fork at Glenwood Springs, Colo.	1,460	477.9	660.8	717.4
89.	(D) San Juan River near Blanco, N. M.	3,558	514.2		
90.	San Juan River near Bluff, Utah	23,010	984.9	988.5	861.5
91.	San Juan River at Farmington, N. M.	7,240	896.9	915.7	874.4
92.	San Juan River at Pagosa Springs, Colo.	298	150.7	153.3	180.3
93.	San Juan River at Rosa, N. M.	1,990	433.4	434.5	464.7
94.	San Juan River at Shiprock, New Mexico	12,900	943.4	956.4	

## *Appendix D (Cont'd)*

Ref. (1)	Streams (2)	Drainage Area Sq. Miles (3)	Discharge during Water Year in 1,000 acre-ft. Units (Provisional)		
			1954 (4)	1955 (5)	1956 (6)
95.	San Miguel River near Placerville, Colorado	308	103.0	127.0	
96.	San Rafael River near Green River, Utah	1,690	39.1	31.8	34.2
97.	Savery Creek near Savery, Wyoming	330	39.4	42.5	58.1
98.	Sheep Creek near Manila, Utah	46	1.5	2.0	
99.	Sheep Creek at mouth near Manila, Utah	111	8.3	8.3	
100.	(B) Sheep Creek Upper Canal, near Manila, Utah		2.8	4.0	
101.	(B) Sheep Creek Lower Canal, near Manila, Utah		8.8	12.4	
102.	Slater Fork near Slater, Colorado	161	30.1	40.2	50.5
103.	Snake River near Montezuma, Colorado	59	25.4	36.3	51.4
104.	South Fork White River at Buford, Colo.	170	130.4	153.8	21.2
105.	(C) Spring Creek at LaBoca, Colorado near Colo.-N. Mex. State Line	58	24.3	22.4	21.2
106.	St. Louis Creek near Fraser, Colorado	33	13.5	19.0	15.5
107.	Strawberry River at Duchesne, Utah	1,040	64.6	72.2	88.5
108.	Taylor River at Almont, Colorado	440	166.6	177.4	224.8
109.	Tenmile Creek at Dillon, Colorado	113	44.0	56.6	86.2



## *Appendix D (Cont'd)*

Ref. (1)	Streams (2)	Drainage Area Sq. Miles (3)	Discharge during Water Year in 1,000 acre-ft. Units (Provisional)		
			1954 (4)	1955 (5)	1956 (6)
110.	Tomichi Creek at Gunnison, Colorado	1,020	50.3	58.6	83.1
111.	Troublesome Creek near Troublesome, Colorado	178	13.5	18.5	36.5
112.	Uinta River near Neola, Utah	181	95.1	96.6	111.8
113.	Uncompahgre River at Colona, Colorado	437	87.6	119.0	118.0
114.	Vasquez Creek near Winter Park, Colorado	27.8	2.5	3.1	7.6
115.	West Fork Beaver Creek near Lonetree, Wyo.		6.8	8.0	
116.	West Fork Smith Fork near Robertson, Wyo.	37	6.4	9.3	15.2
117.	White River at Buford, Colorado	240	160.0	174.7	211.6
118.	White River near Meeker, Colorado	762	301.1	344.5	
119.	White River near Watson, Utah	4,020	340.6	388.0	
120.	Whiterocks River near Whiterocks, Utah	115	57.9	60.3	67.2
121.	Williams River near Leal, Colorado	89.5	32.9	44.3	59.0
122.	(D) Willow Creek near Ouray, Utah	967	12.6	10.7	
123.	Yampa River near Maybell, Colorado	3,410	522.2	772.6	309.1
124.	Yampa River at Steamboat Springs, Colo.	604	156.2	241.6	

## Appendix D (Cont'd)

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- \* This is a U.S.G.S. station but is not required at the present time for administration by the Upper Colorado River Commission.
  - \*\* Drainage area not shown in latest U.S.G.S. water supply paper available.
  - # This station is to be installed or reestablished and operated by the U.S.G.S.
  - (A) Lee Ferry one mile down stream from the mouth of the Paria River is the 1922 "Compact Point," and the discharge at this point is taken as the sum of Nos. 28 and 79.
  - (B) Discharge measurements reported in U.S.G.S. Water Supply Paper 1059 (1946) p. 384.
  - (C) Add Spring Creek to Los Pinos River at LaBoca to give flow at Colorado-Utah State line.  
*N.M.*
  - (D) Discontinued.
  - @ Area from Final Report of Engineering Advisory Committee to Upper Colorado River Compact Commission, November, 1948.





## APPENDIX E

### TRANSMOUNTAIN DIVERSIONS IN UTAH

Diversion	Location	Year	
		1955	1956
		Acre-feet	
Ephraim Tunnel	Near Ephraim	2,950	
Reeder Ditch	Near Spring City	272	
Twin Creek Tunnel	Near Mt. Pleasant	220	
Horseshoe Tunnel	Near Ephraim	409	
Cedar Creek Tunnel	Near Spring City	329	
Spring City Tunnel	Near Spring City	1,880	
Fairview Ditch	Near Fairview	1,280	
Candland Ditch	Near Mt. Pleasant	81	
Black Canyon Ditch	Near Spring City	232	
Larsen Tunnel	Near Ephraim	786	
Madsen Ditch	Near Ephraim	4.6	
John August Ditch	Near Ephraim	246	
Coal Fork Ditch	Near Mt. Pleasant	210	
Hobble Creek Ditch	Near Heber	1,160	1,260
Strawberry River and Willow Creek Ditches	Strawberry River, Willow Creek	2,610	2,350
Strawberry Tunnel	Strawberry River	71,450	
Tropic and East Fork Canal	Near Tropic	2,050	
Duchesne Tunnel near Kamas, Utah	North Fork Duchesne River	32,060	31,890

## APPENDIX F

### TRANSMOUNTAIN DIVERSIONS IN COLORADO

Diversion	Location	Year	
		1955	1956
		Acre-feet	
Alva B. Adams Tunnel (East Portal)	Shadow Mountain Reservoir	256,600	210,700
Berthoud Pass Ditch	Fraser River Tributaries	458	396
Eureka Ditch	Tonahutu Creek	125	52
Grand River Ditch	Colorado River Tribs.	16,150	20,470
Moffat Tunnel (East Portal)		37,020	53,430
Independence Pass Tunnel (Twin Lakes Tunnel)	Roaring Fork Tribs.	35,060	36,440
Williams Fork Tunnel (Jones Pass)	Williams River	10,300	8,880
Boreas Pass Ditch	Blue River	268	260
Hoosier Pass Tunnel	Blue River	6,450	9,290
Columbine Ditch	Tenmile Creek Tribs.	1,160	1,390
Fremont Pass Ditch	Tenmile Creek	none	none
Ewing Ditch	Eagle River	415	1,100
Wurtz Ditch	Eagle River	1,350	2,590
Busk-Ivanhoe Tunnel	Fryingpan River	5,270	4,400
Larkspur Ditch	Tomichi Creek	16	35
Tabor Ditch	Gunnison River	31	167
Fuchs Ditch	N. Fork Los Pinos River	696	941



## *Appendix F (Cont'd)*

### TRANSMOUNTAIN DIVERSIONS IN COLORADO

Diversion	Location	Year	
		1955	1956
		Acre-feet	
Raber-Lohr Ditch	Los Pinos River	3,490	2,630
Treasure Pass Ditch	San Juan River	90	128
Squaw Pass Ditch	San Juan River	71	177
Piedra Ditch	San Juan River	none	84



## *APPENDIX G*

### UPPER COLORADO RIVER COMMISSION

748 North Avenue  
Grand Junction, Colorado

March 8, 1957

Dear Governor Simpson:

At the February 28, 1957 meeting of the Upper Colorado River Commission, Mr. L. C. Bishop, State Engineer of Wyoming and Wyoming's representative on the Commission, announced that he would retire on April 1, 1957.

The Chairman and Federal representative, Mr. R. J. Newell, Commissioner John H. Bliss of New Mexico, Commissioner George D. Clyde of Utah, and Commissioner Frank Delaney of Colorado voted unanimously to thank Mr. Bishop for his long and faithful service, not only to your great State of Wyoming, but also to the Upper Colorado River Commission and to all four States represented.

The above gentlemen, their advisers, and the guests present were of one mind in their praise for Mr. Bishop and their regret that he will no longer be a member of the Commission.

Having known him for almost twenty years, and having been associated with him with respect to work in Teton Basin, negotiations of the Snake River Compact, early negotiations of the Columbia River Basin Compact, and currently as an employee of the Upper Colorado River Commission under his direction, I can assure you that I have a very deep personal regard for Mr. Bishop. He has always represented his State with dignity. His straightforward attitude and good judgment on innumerable occasions have proved to be one-hundred percent honest and reliable. In many instances his advice and example have been of great inspiration.



## *Appendix G (Cont'd)*

All of us associated with the Upper Colorado River Commission wish to join you and the people of your great State in wishing a long and fruitful future for our friend, Mr. L. Clark Bishop, State Engineer of Wyoming and a Commissioner of whose absence we will be acutely conscious.

Sincerely yours,  
|s| Ival V. Goslin  
Ival V. Goslin  
Engineer-Secretary

Honorable Milward L. Simpson  
Governor, State of Wyoming  
Capitol Building  
Cheyenne, Wyoming  
IVG:dd



## APPENDIX H

### RESOLUTION PAYING TRIBUTE TO WILLIAM ROSS WALLACE

WHEREAS, WILLIAM ROSS WALLACE, was summoned to his reward on January 29, 1957; and

WHEREAS, he was a man of many accomplishments who gave freely of his time and his talents, in the interest of his fellow men, in water conservation; and

WHEREAS, in addition to his many contributions as a business man and a civic leader he was champion of the effort to establish and protect water rights, working continuously and effectively to develop the water resources of the West; and

WHEREAS, he made significant contributions in the framing and enactment of the Colorado River Compact of 1922, the treaty with Mexico in 1944, and the Upper Colorado River Basin Compact of 1948;

NOW, THEREFORE, BE IT RESOLVED that the Upper Colorado River Commission on behalf of the people of the four Upper Basin States, pays tribute to this dignified man who has freely and unstintingly given of his time, his unlimited energy and his conspicuous ability, ripened by rich and extensive experience, with great satisfaction for his record of a long life of usefulness and achievement; and

BE IT FURTHER RESOLVED that a copy of this Resolution be spread upon the minutes of the Commission and that copies be sent to his sisters and each of his children.







The relief model of the Upper Colorado River Basin, pictured above, was constructed by the Upper Colorado River Commission in cooperation with the Babson Institute of Business Administration. This model shows the topographic features of the area and indicates location of major units of the Colorado River Storage Project and Participating Projects. It is used by the Commission in work connected with administration of Upper Basin activities and is available at times for display at conventions and other public events.

## The Upper Colorado River Commission

748 North Avenue • Grand Junction, Colorado



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