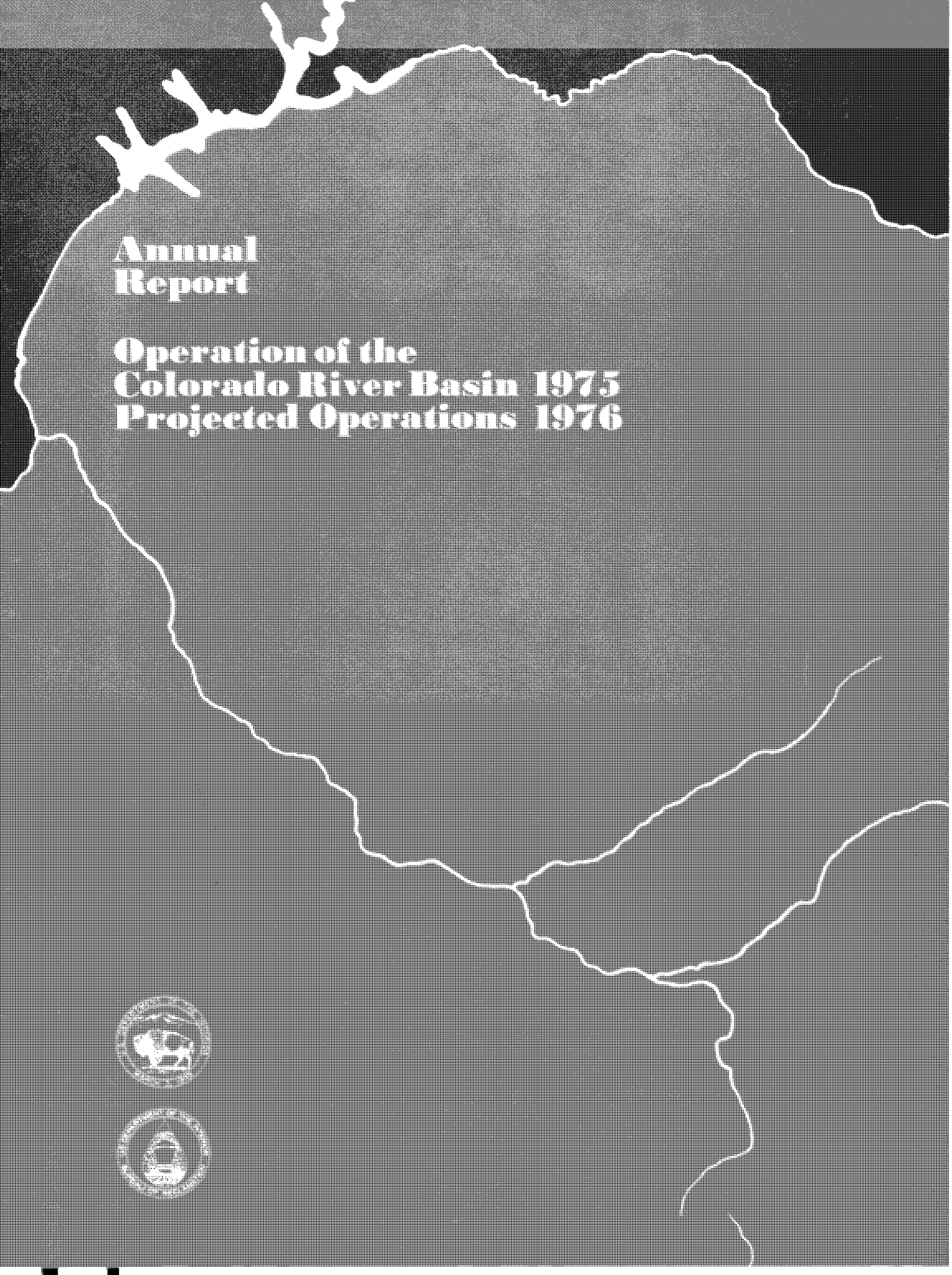
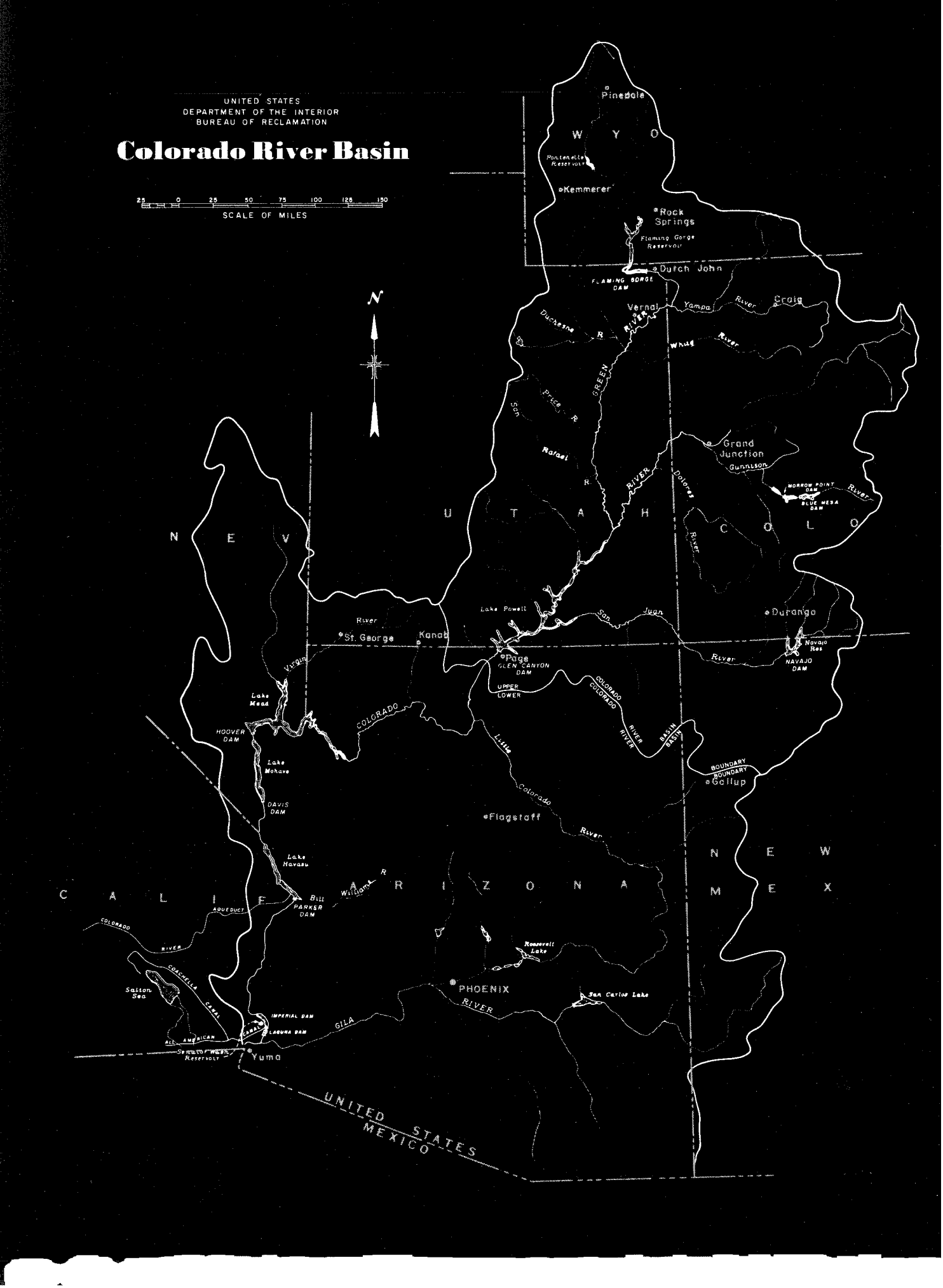


Annual Report

Operation of the Colorado River Basin 1975 Projected Operations 1976


UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
Colorado River Basin
25 0 25 50 75 100 125 150
SCALE OF MILES
N
Pinedale
W Y O
Fontenelle Reservoir
Kemmerer
Rock Springs
Flaming Gorge Reservoir
FLAMING GORGE DAM
Dutch John
Vernal
Yampa River
Craig
Duchesne R.
White River
GREEN RIVER
San Rafael R.
Price R.
Grand Junction
Gunnison
MORROW POINT DAM
BLUE MESA DAM
Dolores River
U T A H
C O L O
N E V
Lake Powell
San Juan River
Durango
Navajo Res
NAVAJO DAM
Virgin River
St. George
Kanab
Page
GLEN CANYON DAM
UPPER
LOWER
COLORADO RIVER BASIN
Lake Mead
HOOVER DAM
COLORADO
Lake Mohave
DAVIS DAM
Little Colorado River
BOUNDARY
Gallup
Flagstaff
Lake Havasu
Bill Williams R.
A R I Z O N A
N E W M E X
C A L I F
AQUEDUCT
Bill PARKER DAM
COLORADO RIVER
Roosevelt Lake
COACHELLA CANAL
Salton Sea
PHOENIX
San Carlos Lake
IMPERIAL DAM
ALL AMERICAN CANAL
LAGUNA DAM
GILA RIVER
Senator Wash Reservoir
Yuma
UNITED STATES
MEXICO

Annual Report

Operation of the Colorado River Basin 1975 Projected Operations 1976

(Prepared pursuant to the
Colorado River Basin Project Act of 1968,
Public Law 90-537)

U.S. Department of the Interior
Thomas S. Kleppe, Secretary

Bureau of Reclamation
Gilbert G. Stamm, Commissioner

January 1976

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Introduction

The operation of the Colorado River during the past year and the projected operation for the current year reflect domestic use, irrigation, hydroelectric power generation, water quality control, fish and wildlife propagation, recreation, flood control, and Colorado River Compact requirements.

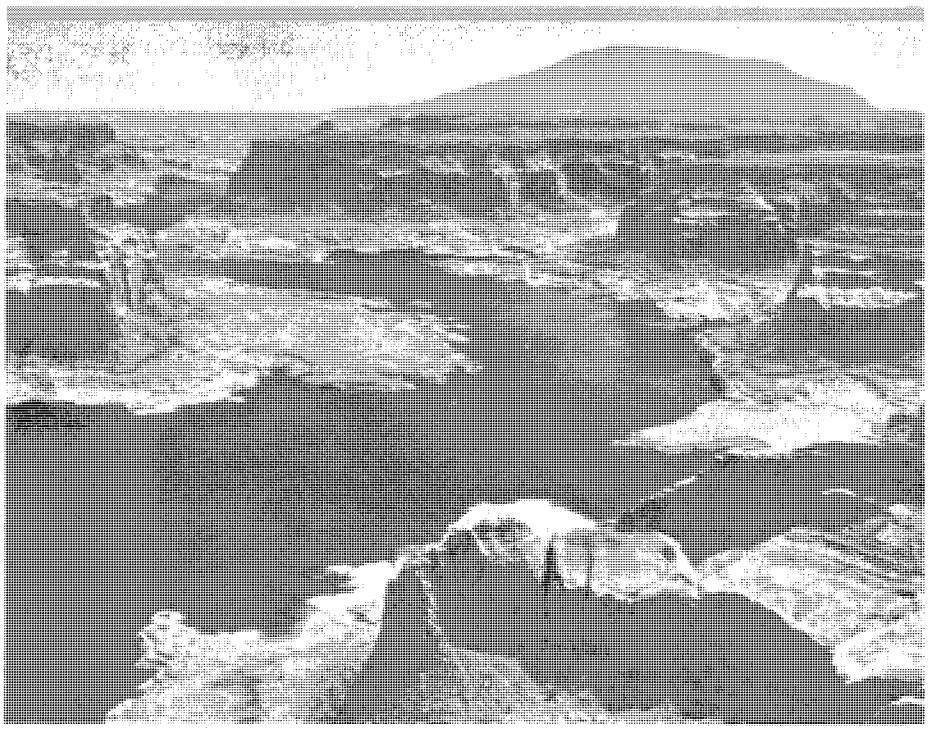
Storage and release of water from the Upper Basin reservoirs recognize all applicable laws and relevant factors governing the Colorado River, including the impoundment of water in the Upper Basin required by section 602(a) of Public Law 90-537. The operation of the Lower Basin reservoirs reflects Mexican Treaty obligations and Lower Basin contractual commitments.

Authority for Report

Pursuant to the Colorado River Basin Project Act (P.L. 90-537) of 1968, I am pleased to present to the Congress and to the Governors of the Colorado River Basin States, the fifth Annual Report on the Operation of the Colorado River.

This report describes the actual operation of the reservoirs in the Colorado River drainage area constructed under the authority of the Colorado River Storage Project Act, the Boulder Canyon Project Act, and the Boulder Canyon Project Adjustment Act during water year 1975 and the projected operation of these reservoirs during water year 1976 under the "Criteria for Coordinated Long-Range Operation of Colorado River Reservoirs," published in the *Federal Register* June 10, 1970.

Thomas S. Kleppe, Secretary
U.S. Department of the Interior



Actual Operations Under Criteria— Water Year 1975

Operation of the Colorado River during 1975 was based on a forecast of runoff. Starting January 1, the snowmelt runoff was forecast and the required release of stored water to meet demands was scheduled for each reservoir through September. At the beginning of each month thereafter through June, the forecast was revised based on precipitation and snow data collected during the month and the scheduled operation was revised accordingly.

A description of the actual operation of each of the reservoirs in the Colorado River Basin is given in the following paragraphs. Charts 1 through 9 show hydrographs of monthly outflow from the reservoirs and water surface elevation and active storage in the reservoirs for water year 1975.

Upper Basin Reservoirs

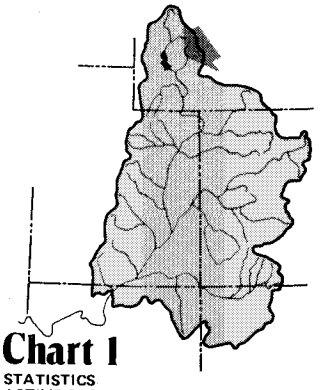


Chart 1

STATISTICS
ACTIVE STORAGE*

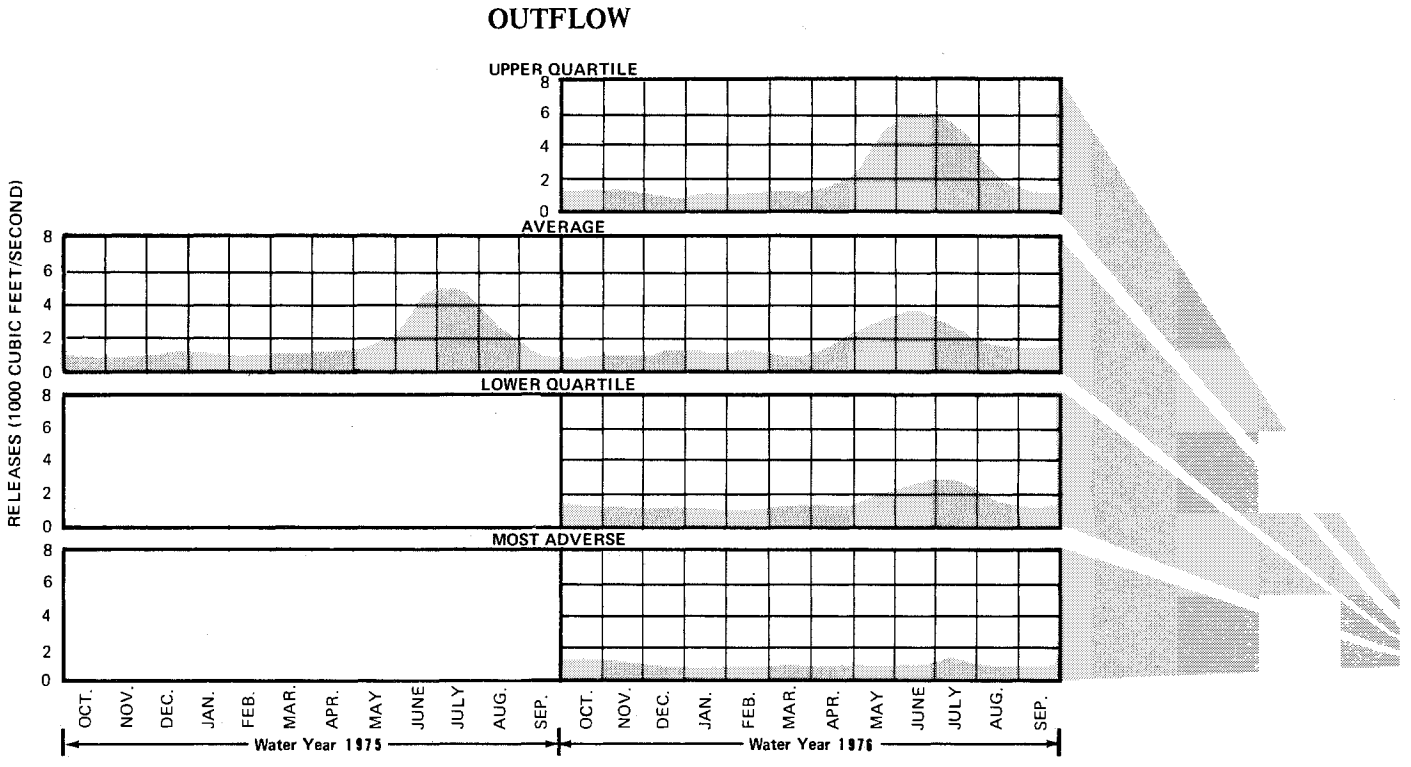
RESERVOIR	(ACRE-FEET)	ELEVATION (FEET)
MAXIMUM STORAGE	344,834	6506
RATED HEAD	233,789	6491
MINIMUM POWER	194,962	6485
SURFACE AREA (FULL)	8058 ACRES	
RESERVOIR LENGTH (FULL)	18 MILES	
POWER PLANT		
NUMBER OF UNITS	1	
TOTAL CAPACITY	10,000 KILOWATTS	

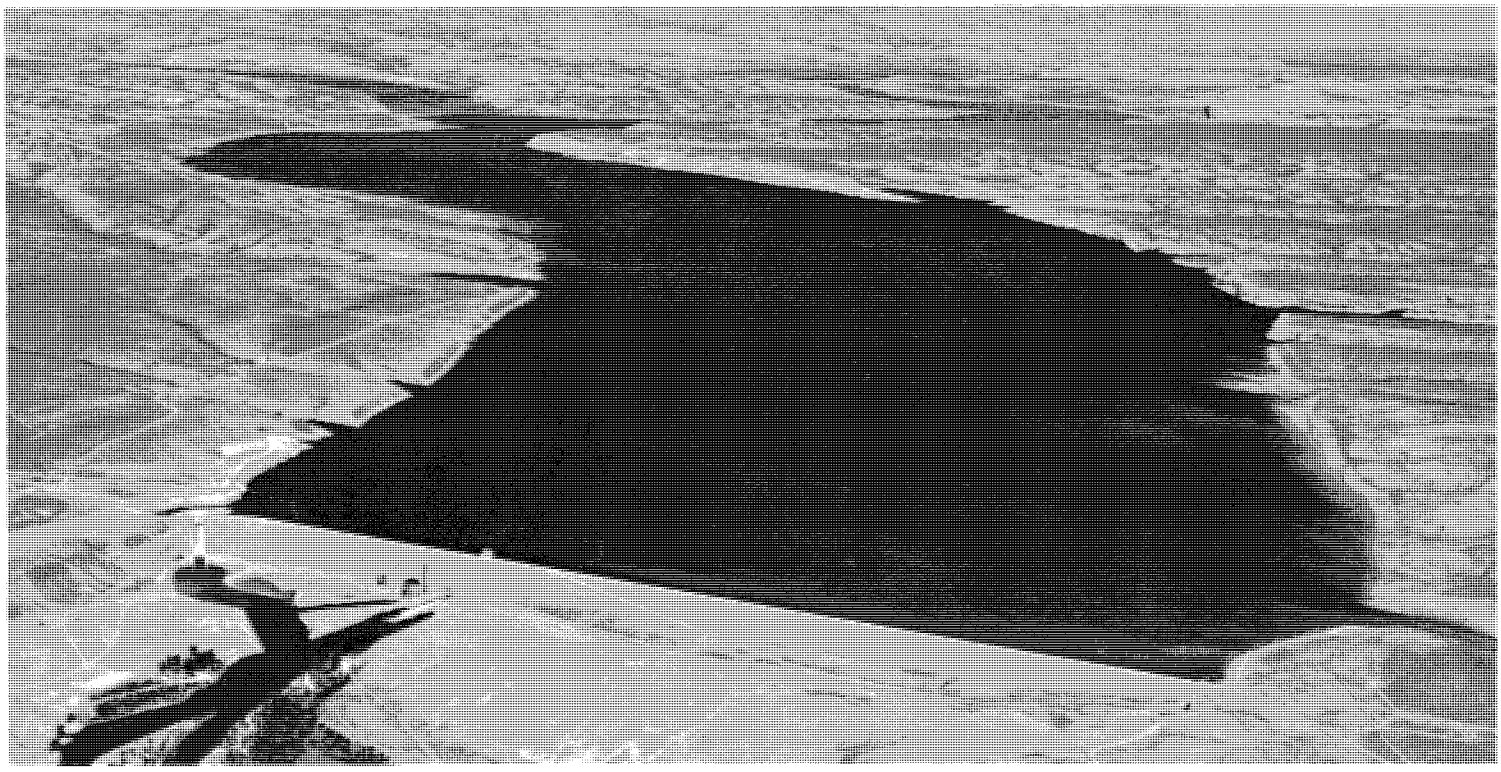
**does not include 563 acre feet of dead storage below 6408 feet*

Fontenelle Reservoir

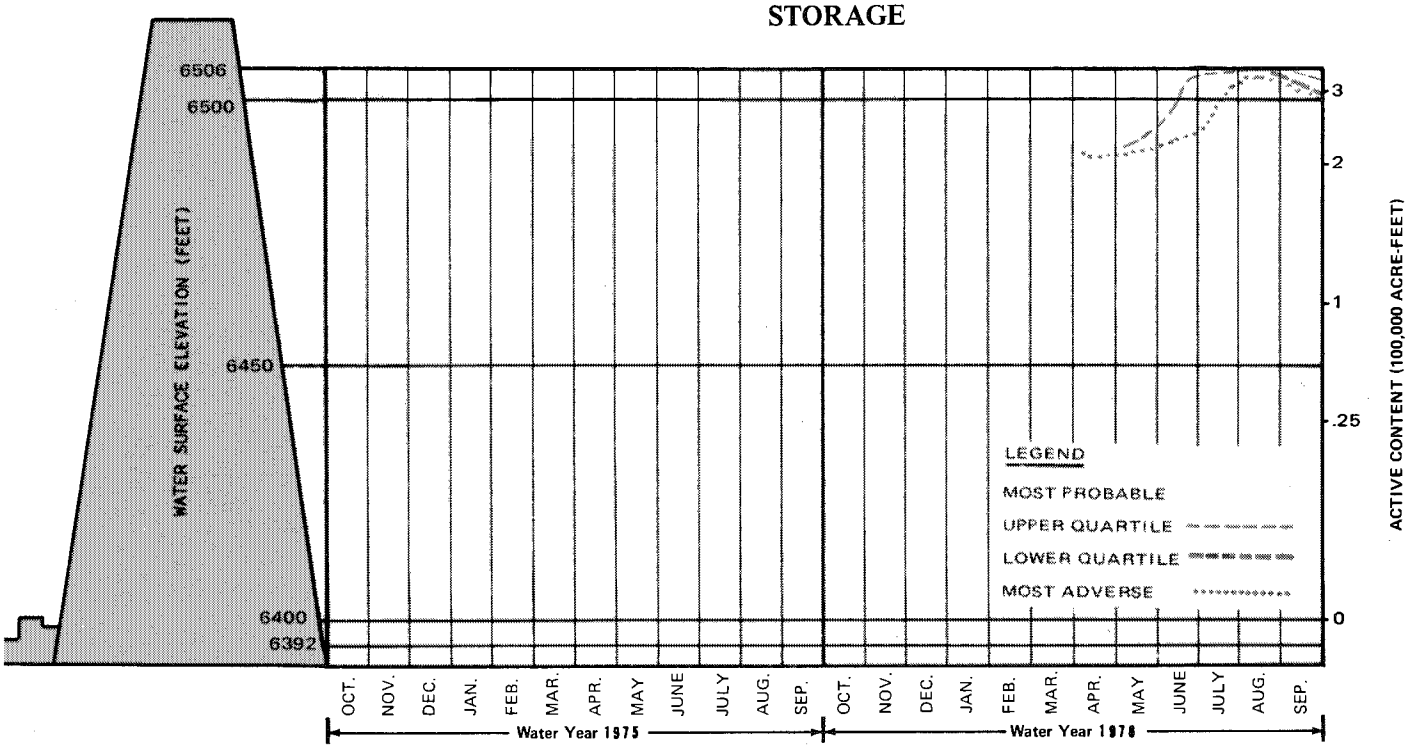
During the past year, Fontenelle Reservoir was operated for hydroelectric generation, flood control, fish and wildlife enhancement, and for recreation. During the fall and winter of 1974-75, the reservoir water surface elevation was reduced slowly from elevation 6,502 feet at the beginning of the water year to a low elevation of 6,480 feet prior to spring runoff in April. The minimum release during the fall and winter was 600 cubic feet per second (ft^3/s) to generate power and maintain fish flows. Springtime releases were controlled to allow the reservoir to fill late in June. Maximum releases of 6,600 ft^3/s from the reservoir occurred early in July.

The reservoir, as of September 30, 1975, had 330,000 acre-feet of water in active storage at elevation 6,504 feet. (Chart 1.)





STORAGE


6506
6500
6450
6400
6392
WATER SURFACE ELEVATION (FEET)
3
2
1
.25
0
ACTIVE CONTENT (100,000 ACRE-FEET)
LEGEND
MOST PROBABLE
UPPER QUARTILE
LOWER QUARTILE
MOST ADVERSE
OCT.
NOV.
DEC.
JAN.
FEB.
MAR.
APR.
MAY
JUNE
JULY
AUG.
SEP.
Water Year 1975
Water Year 1976

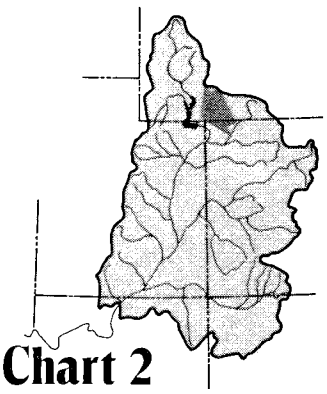


Chart 2

STATISTICS
ACTIVE STORAGE*

RESERVOIR	ACRE-FEET)	ELEVATION (FEET)
MAXIMUM STORAGE	3,749,000	6040
RATED HEAD	1,062,000	5946
MINIMUM POWER	233,000	5871
SURFACE AREA (FULL)	42,020 ACRES	
RESERVOIR LENGTH (FULL)	91 MILES	

POWER PLANT

NUMBER OF UNITS	3
TOTAL CAPACITY	108,000 KILOWATTS

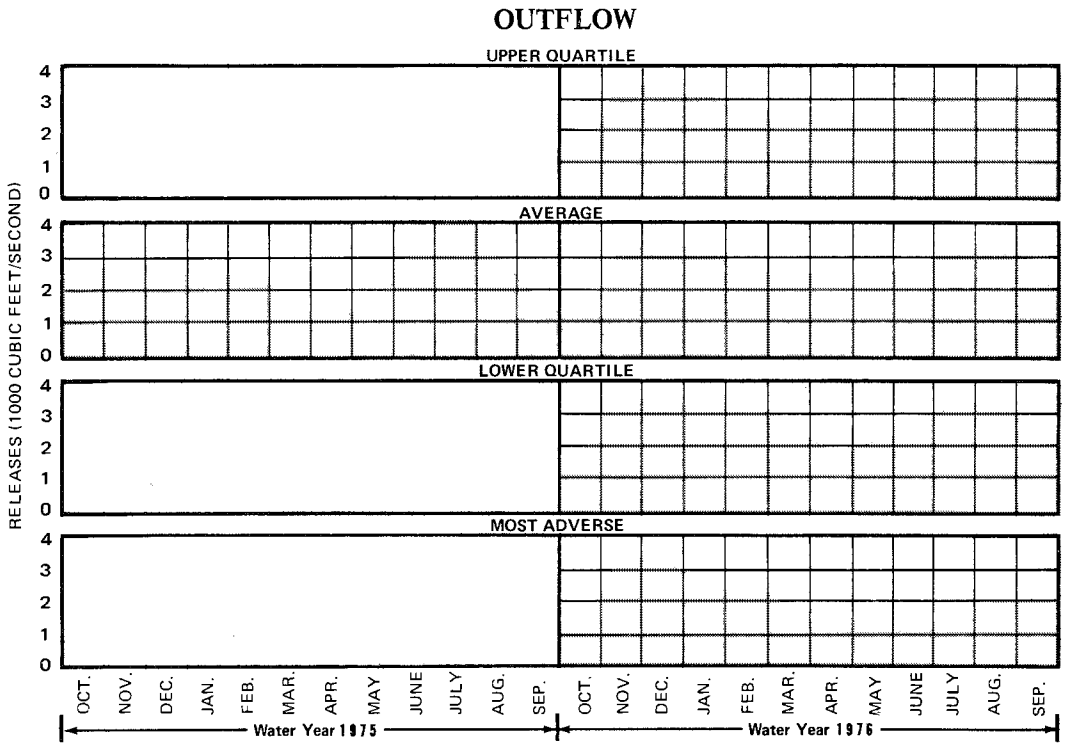
**does not include 40,000 acre feet of dead storage below 5740 feet*

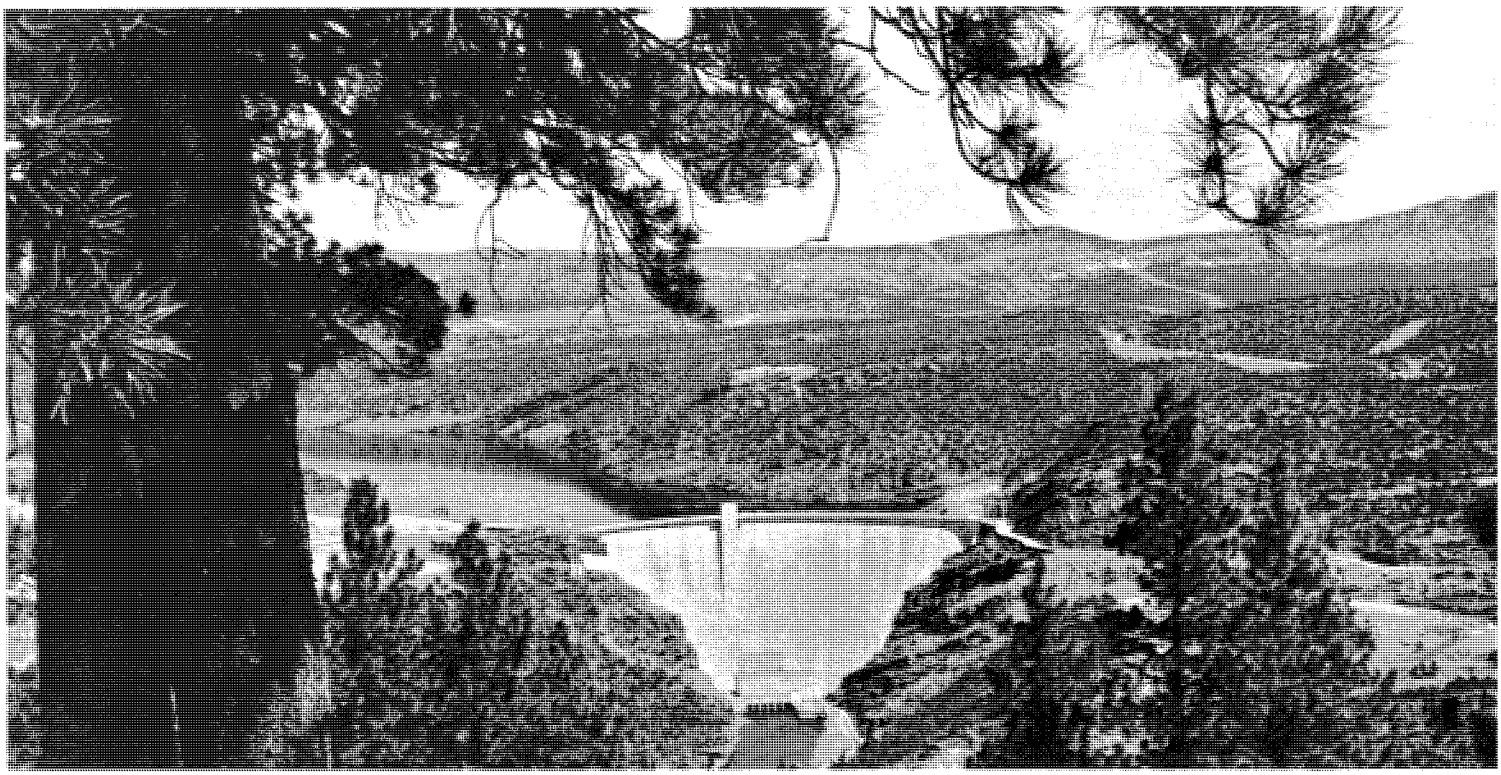
Flaming Gorge Reservoir

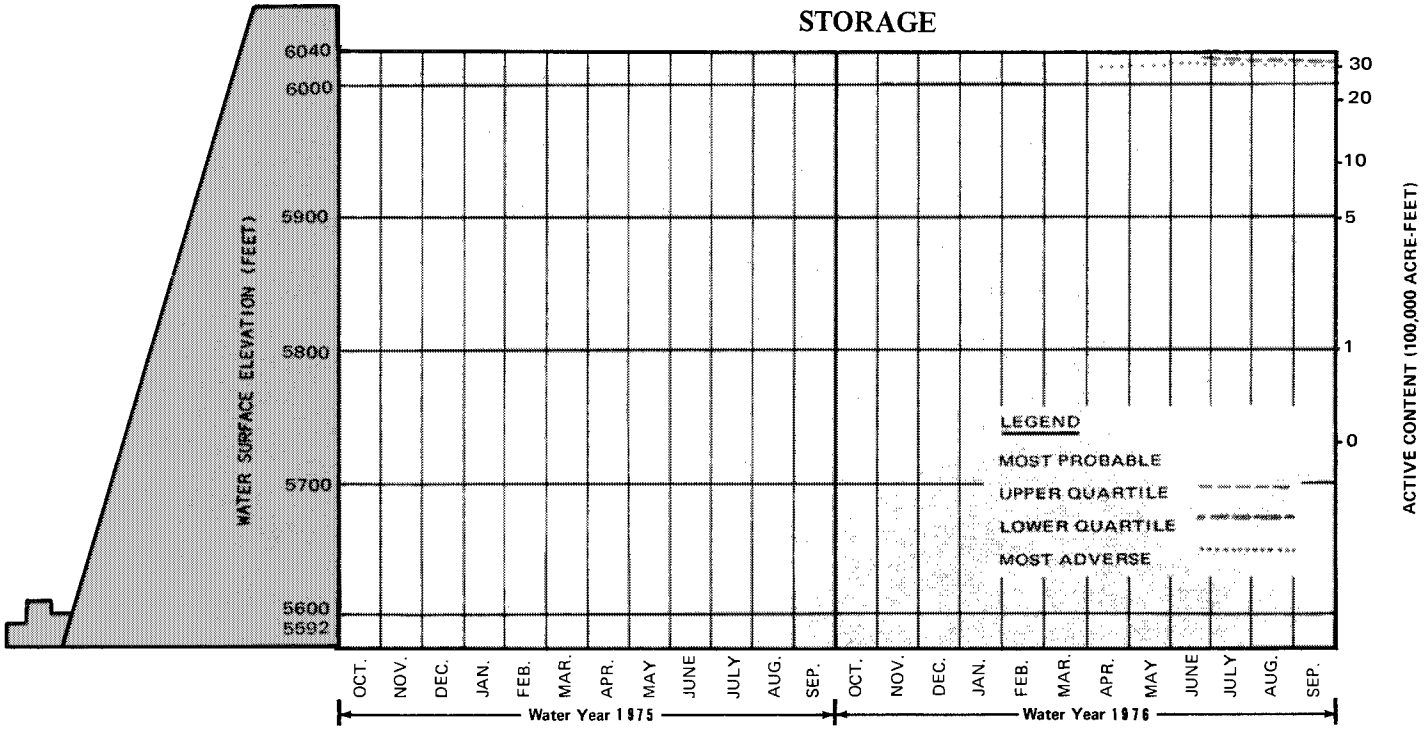
Flaming Gorge Reservoir is operated as part of the Colorado River storage project (CRSP) in accordance with governing compacts and laws to provide river regulation, optimum power production, recreational opportunities, and fish and wildlife benefits.

On September 30, 1974, the Flaming Gorge water surface was at elevation 6,036 feet. The active storage was 3,583,000 acre-feet. Releases for power production caused the reservoir to recede 13 feet during the fall and winter to elevation 6,023 feet. The April-July 1975 runoff above Flaming Gorge was 1,635,000 acre-feet, or 143 percent of the long-time average. With this runoff, Flaming Gorge filled on July 28, 1975, at elevation 6,040 feet with an active storage of 3,750,000 acre-feet of water. (Chart 2.)

During August, September, and October, reservoir releases were increased to above normal. The reservoir water level was drawn down so releases during November could be reduced to permit operation of construction equipment in the river below the dam to remove material deposited during spillway testing in July 1975.






STORAGE
6040
6000
5900
5800
5700
5600
5592
WATER SURFACE ELEVATION (FEET)
30
20
10
5
1
0
ACTIVE CONTENT (100,000 ACRE-FEET)
LEGEND
MOST PROBABLE
UPPER QUARTILE
LOWER QUARTILE
MOST ADVERSE
OCT.
NOV.
DEC.
JAN.
FEB.
MAR.
APR.
MAY
JUNE
JULY
AUG.
SEP.
Water Year 1975
Water Year 1976

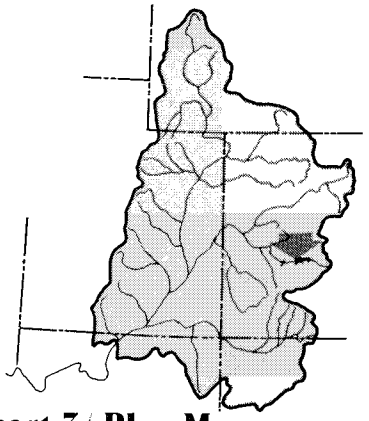


Chart 3/ Blue Mesa Reservoir

STATISTICS
ACTIVE STORAGE*

RESERVOIR	(ACRE-FEET)	ELEVATION (FEET)
MAXIMUM STORAGE	829,523	7519
RATED HEAD	249,395	7438
MINIMUM POWER	81,070	7393
SURFACE AREA (FULL)	9180 ACRES	
RESERVOIR LENGTH (FULL)	24 MILES	

POWER PLANT

NUMBER OF UNITS	2
TOTAL CAPACITY OF UNITS	60,000 KILOWATTS

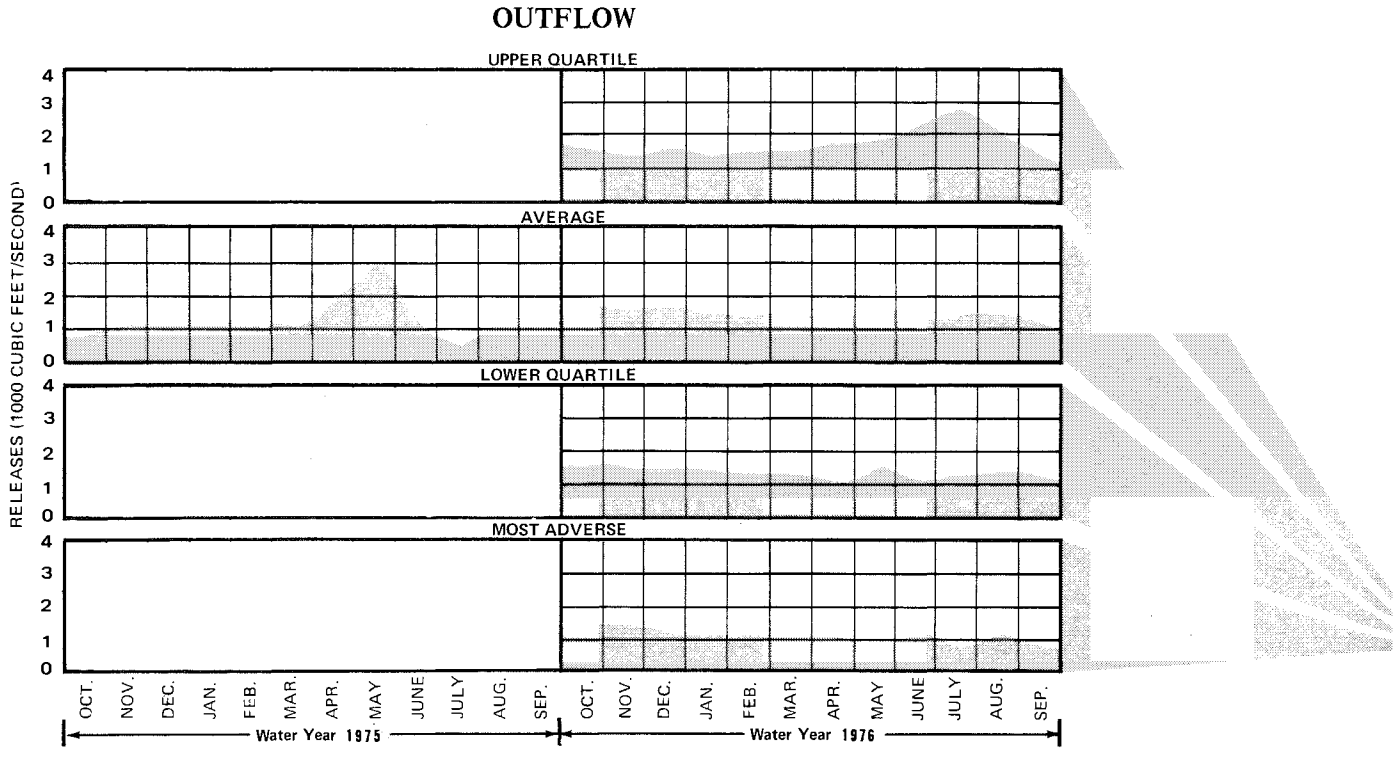
*does not include 111,232 acre feet of dead storage below 7358 feet

Curecanti Unit

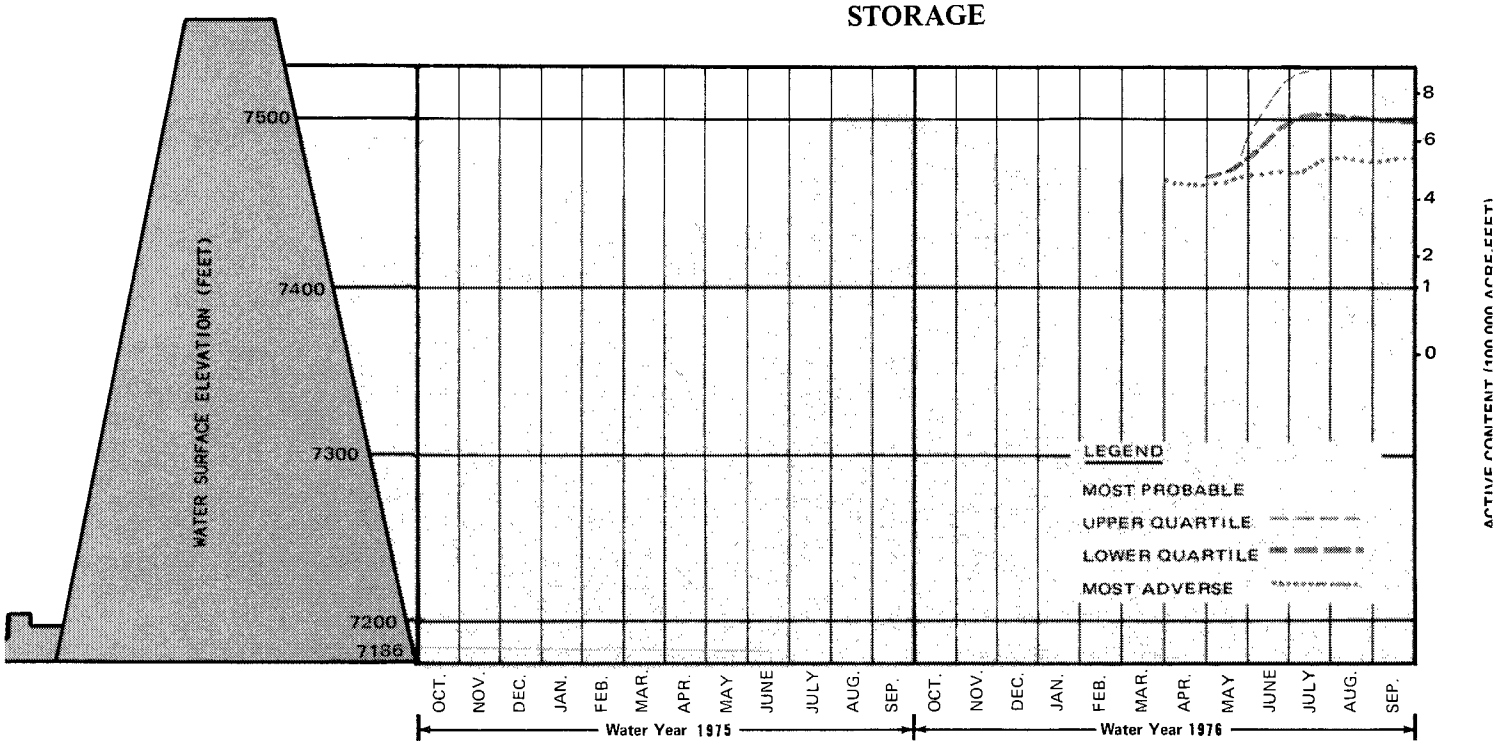
At the end of September 1974, Blue Mesa Reservoir had 578,000 acre-feet of active water storage, with a surface elevation of 7,490 feet. The reservoir was drawn down to elevation 7,440 feet during May 1975, with a content of 261,000 acre-feet. During April-July 1975, inflow to Blue Mesa was 829,000 acre-feet, with a 1975 water year total of 1,080,000 acre-feet. The seasonal high water level for the reservoir was elevation 7,508 feet and an active storage of 730,000 acre-feet. During water year 1975, a minimum flow of 200 ft^3/s was maintained below Gunnison Tunnel to protect the fishery.

The March 1, 1975, forecast of the April-July 1975 inflow to Blue Mesa was 820,000 acre-feet. The flood control regulations did not require evacuation of space during the snowmelt season; consequently, the operation of Blue Mesa did not include releases for flood control. (Chart 3.)

From May 1 through September 30, 1975, reduced releases from Blue Mesa caused flows to be compatible with construction activities at the Crystal Dam site.



STORAGE


WATER SURFACE ELEVATION (FEET)
7500
7400
7300
7200
7136
8
6
4
2
1
0
ACTIVE CONTENT (100,000 ACRE-FEET)
LEGEND
MOST PROBABLE
UPPER QUARTILE
LOWER QUARTILE
MOST ADVERSE
OCT.
NOV.
DEC.
JAN.
FEB.
MAR.
APR.
MAY
JUNE
JULY
AUG.
SEP.
Water Year 1975
Water Year 1976

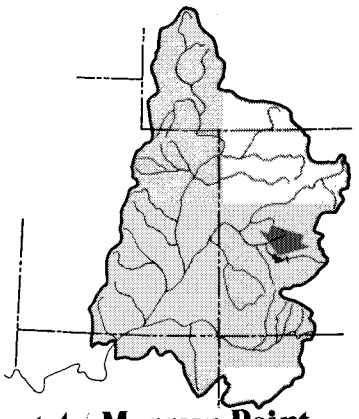


Chart 4 / Morrow Point Reservoir

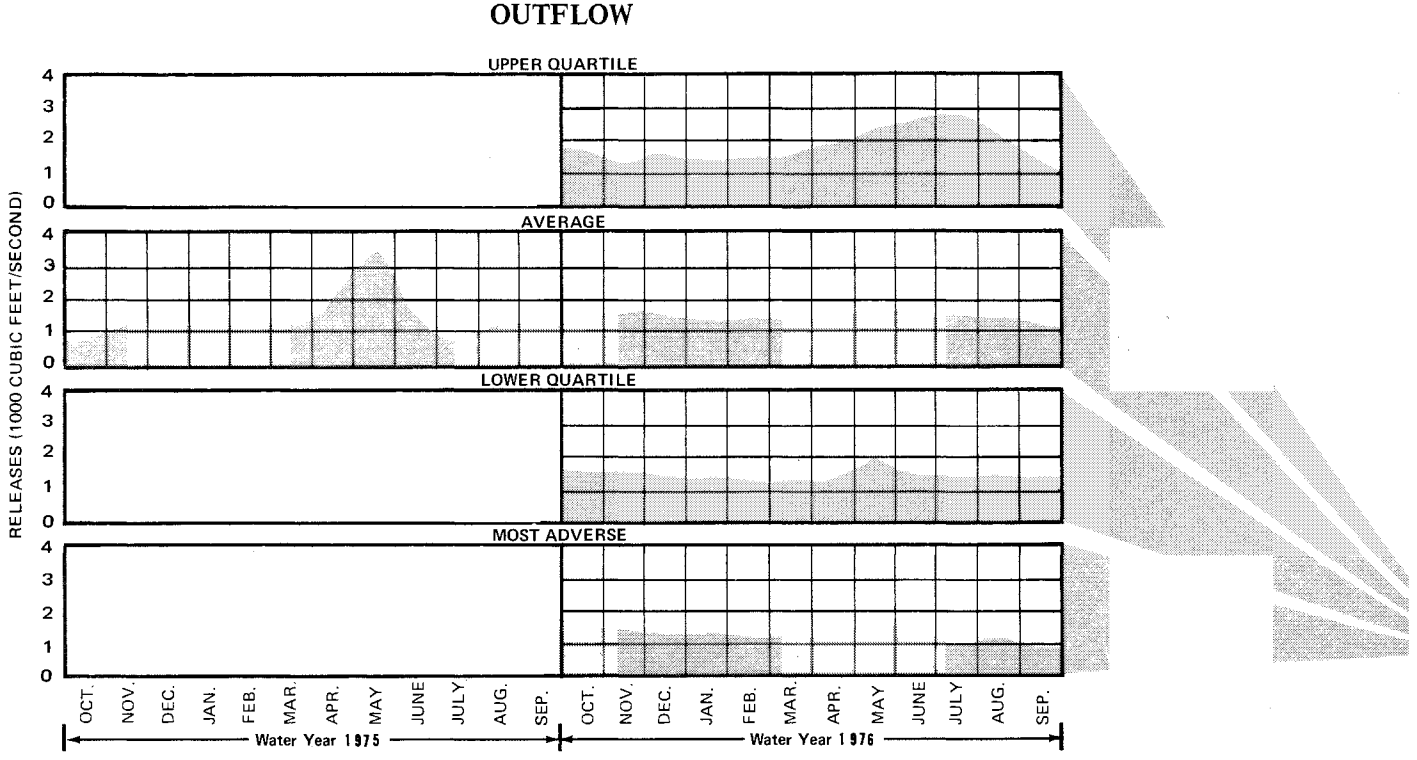
STATISTICS ACTIVE STORAGE* RESERVOIR	(ACRE-FEET)	ELEVATION (FEET)
MAXIMUM STORAGE	117,025	7160
RATED HEAD	79,805	7108
MINIMUM POWER	74,905	7100
SURFACE AREA (FULL)	817 ACRES	
RESERVOIR LENGTH (FULL)	11 MILES	
POWER PLANT		
NUMBER OF UNITS	2	
TOTAL CAPACITY OF UNITS	120,000 KILOWATTS	

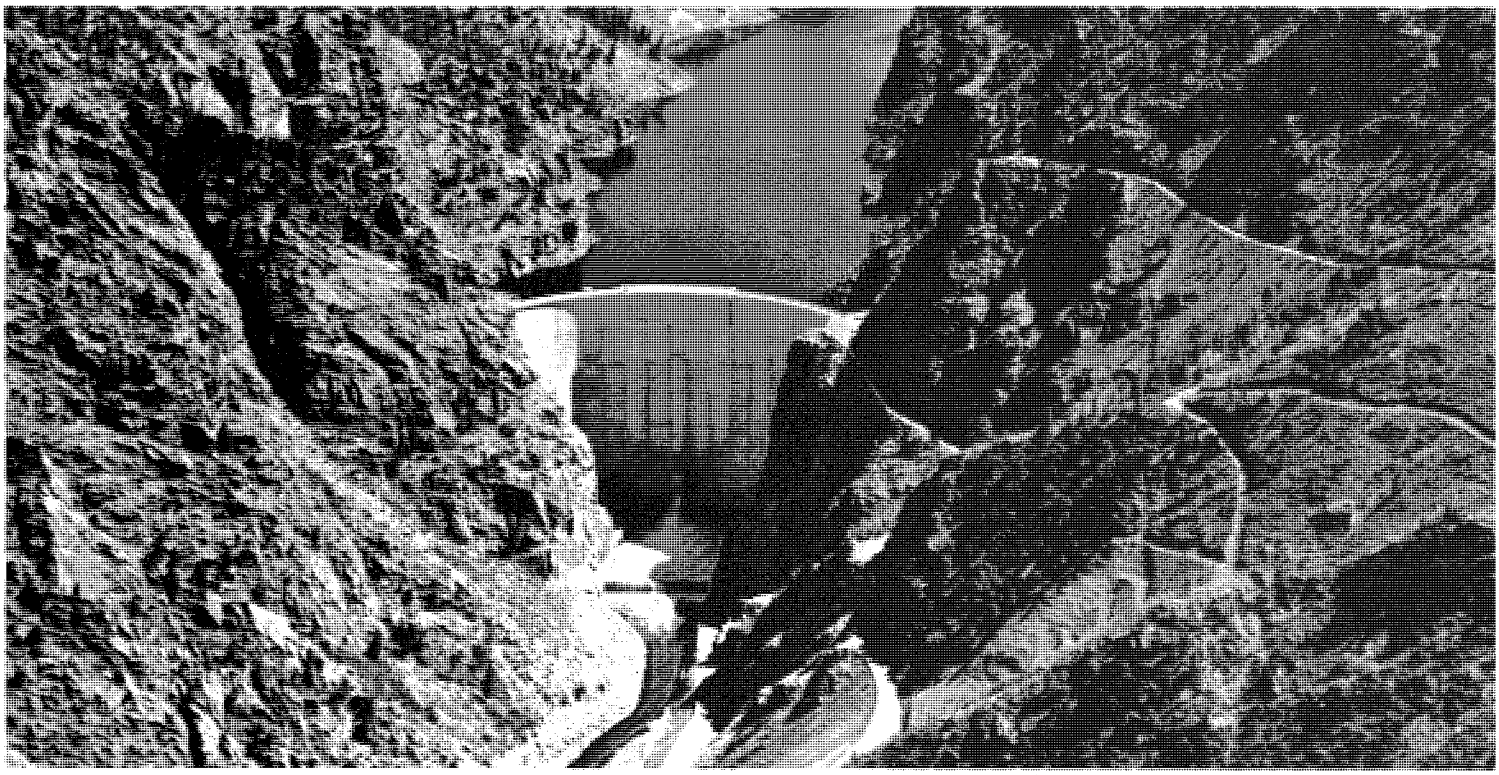
**does not include the 165 acre feet of dead storage below 6808 feet*

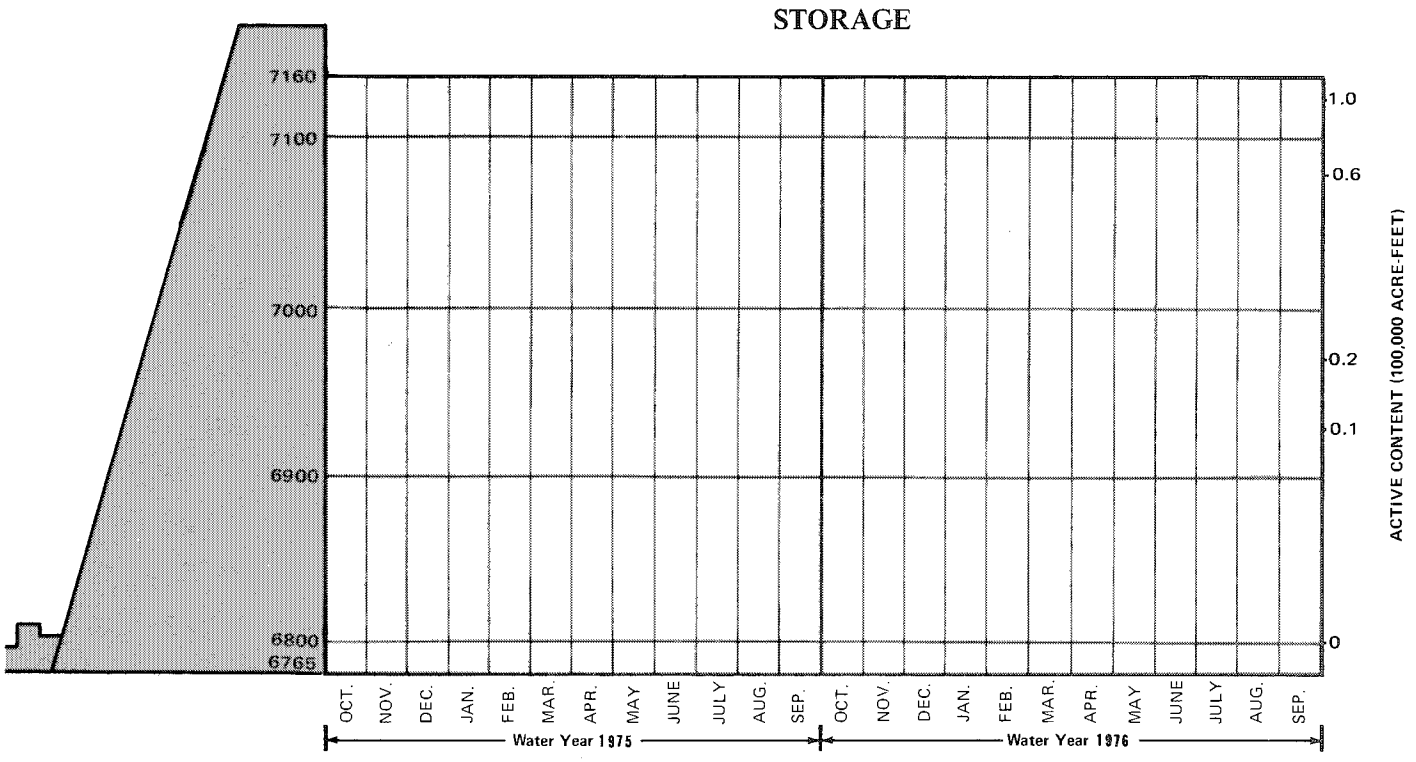
Curecanti Unit

Morrow Point Reservoir was essentially full during water year 1975. On September 30, 1974, the reservoir contained 113,000 acre-feet of active storage at a water surface elevation of 7,154 feet. Its inflow is extensively controlled by the operation of Blue Mesa Reservoir, which is upstream.

Usually, Morrow Point Reservoir will be operated at or near full capacity regardless of the amount of snowmelt runoff. (Chart 4.)






STORAGE
7160
7100
7000
6900
6800
6765
1.0
0.6
0.2
0.1
0
ACTIVE CONTENT (100,000 ACRE-FEET)
OCT.
NOV.
DEC.
JAN.
FEB.
MAR.
APR.
MAY
JUNE
JULY
AUG.
SEP.
Water Year 1975
Water Year 1976

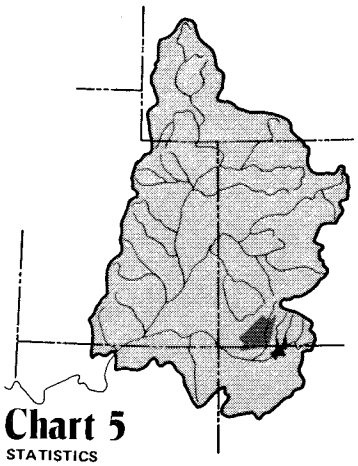


Chart 5

STATISTICS
ACTIVE STORAGE*

RESERVOIR	(ACRE-FEET)	ELEVATION (FEET)
MAXIMUM STORAGE	1,696,400	6085
INACTIVE STORAGE	660,500	5990
SURFACE AREA (FULL)	15,610 ACRES	
RESERVOIR LENGTH (FULL)	33 MILES	

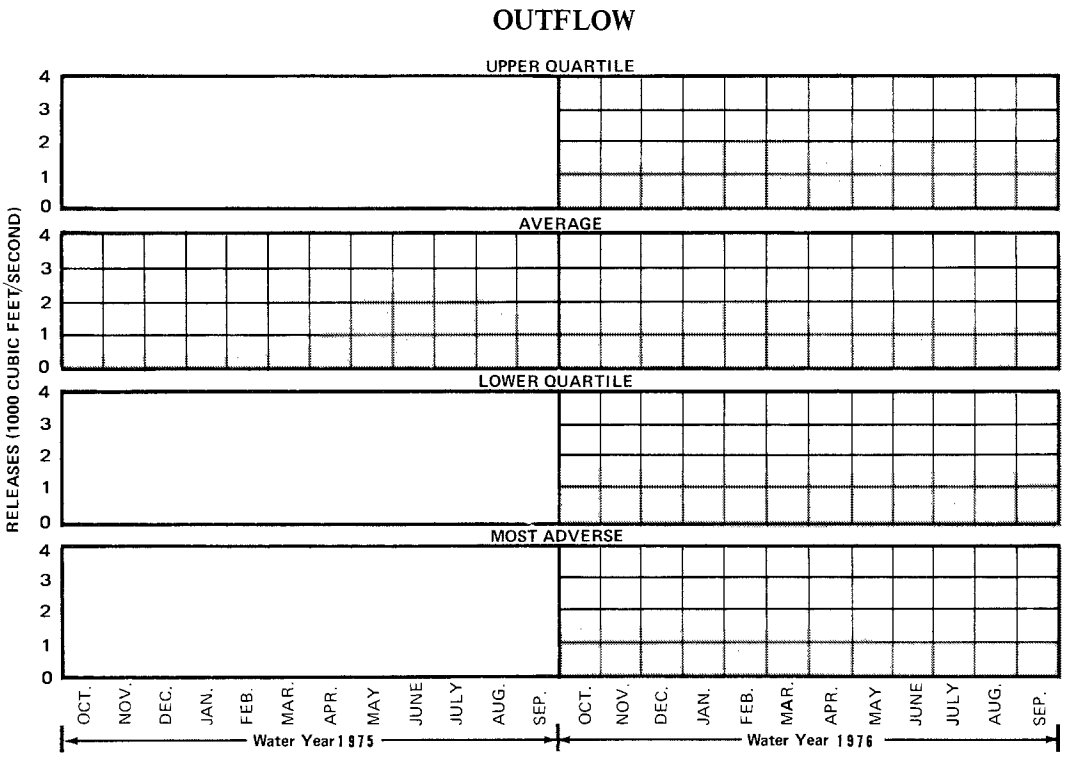
**does not include 12,600 acre feet of dead storage below elevation 5775 feet*

Navajo Reservoir

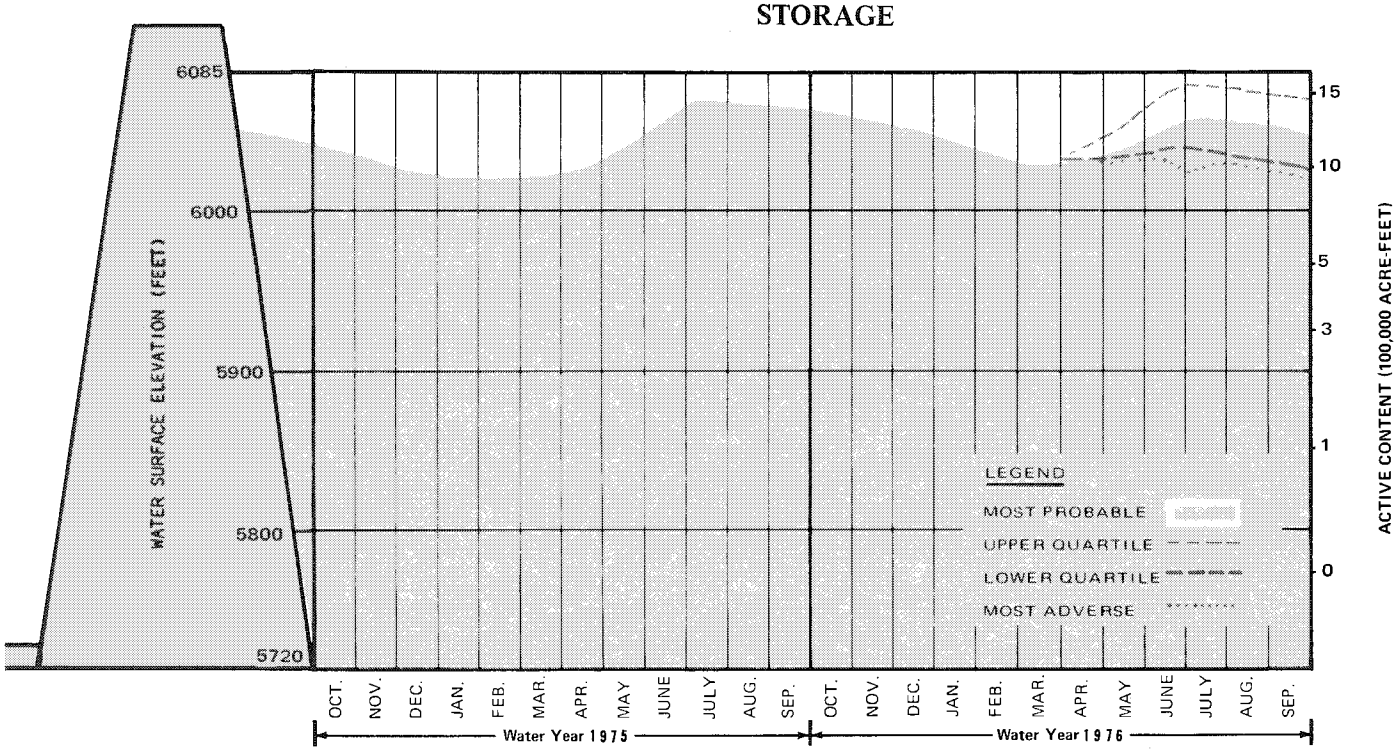
During water year 1975, Navajo Reservoir was kept within the limits specified by the Bureau of Reclamation in its interim operation rules. The reservoir water surface was lowered to elevation 6,023 feet during the winter of 1974 and spring of 1975. The actual April-July inflow to Navajo Reservoir was 1,114,000 acre-feet, or 153 percent of the long-time April-July runoff average above Navajo. The high spring runoff caused the Navajo Reservoir water surface to reach elevation 6,074 feet with a live storage of 1,528,-000 acre-feet late in July.

Navajo Reservoir is operated under a formal flood control plan. On March 1, 1975, Navajo Reservoir had 935,000 acre-feet of water in storage. The April-July inflow forecast on March 1 was 660,000 acre-feet. Based on the March 1 forecast, the current flood control diagram allowed the reservoir to be full, and the scheduled operation of the reservoir did not include any releases specifically required for flood control. (Chart 5.)

Releases were scheduled to control downstream flows to the minimum level practicable in order to minimize bank erosion.



STORAGE


6085
6000
5900
5800
5720
WATER SURFACE ELEVATION (FEET)
15
10
5
3
1
0
ACTIVE CONTENT (100,000 ACRE-FEET)
LEGEND
MOST PROBABLE
UPPER QUARTILE
LOWER QUARTILE
MOST ADVERSE
OCT.
NOV.
DEC.
JAN.
FEB.
MAR.
APR.
MAY
JUNE
JULY
AUG.
SEP.
Water Year 1975
Water Year 1976

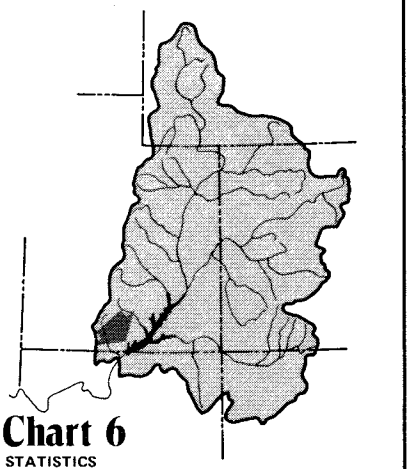


Chart 6

STATISTICS
ACTIVE STORAGE*

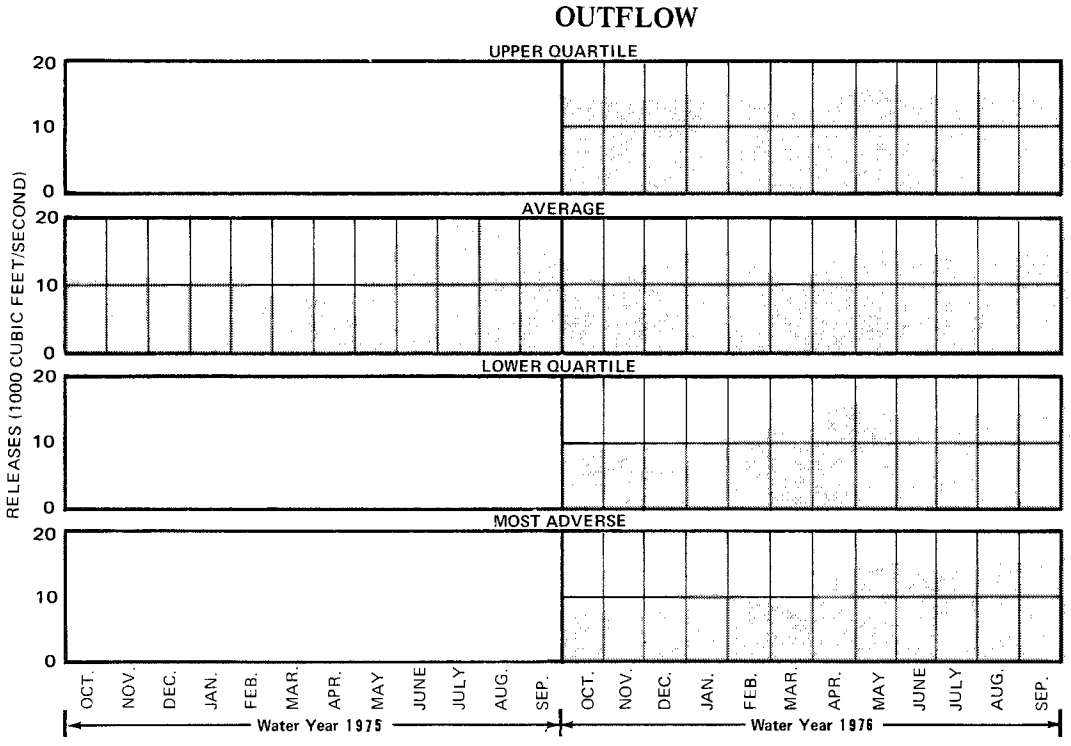
RESERVOIR	(ACRE-FEET)	ELEVATION (FEET)
MAXIMUM STORAGE	25,002,000	3700
RATED HEAD	9,428,000	3570
MINIMUM POWER	4,126,000	3490
SURFACE AREA (FULL)	161,390 ACRES	
RESERVOIR LENGTH (FULL)	186 MILES	
POWER PLANT		
NUMBER OF UNITS	8	
TOTAL CAPACITY OF UNITS	900,000 KILOWATTS	

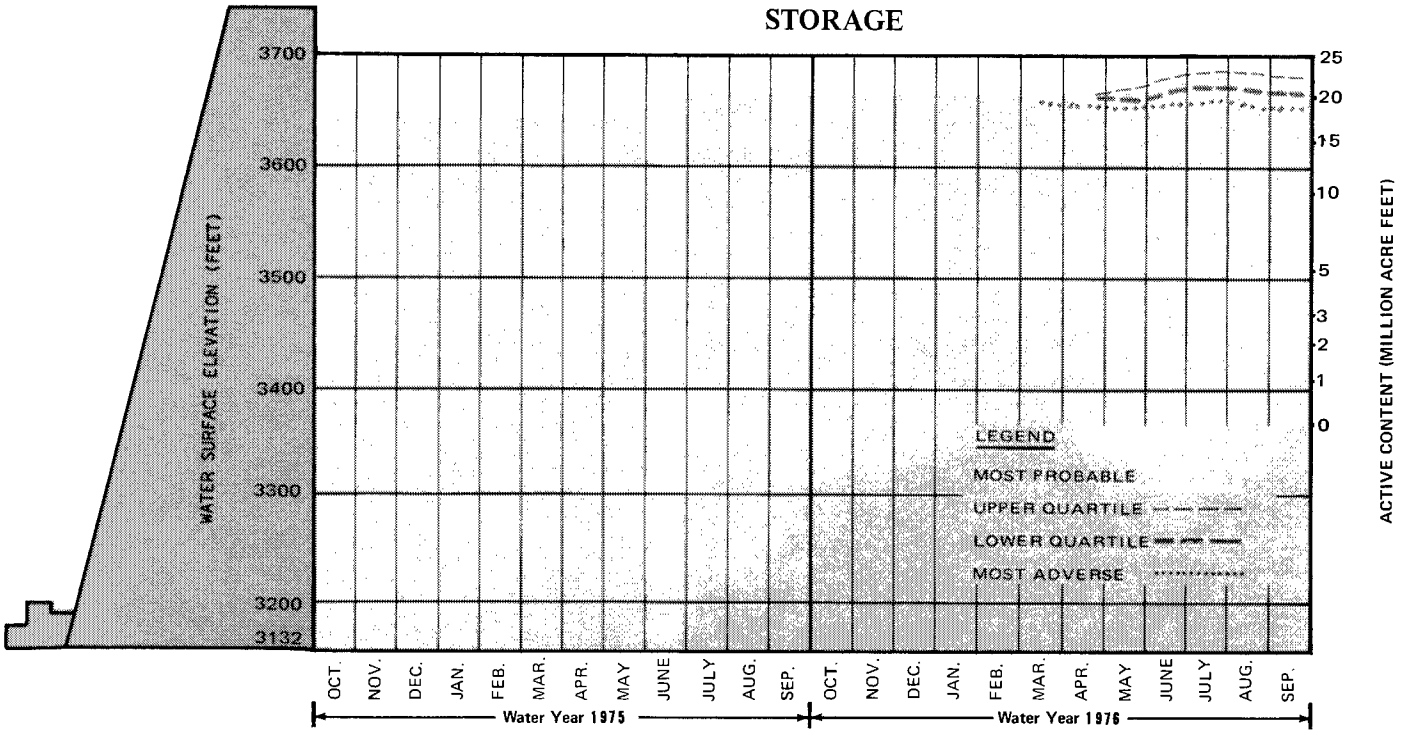
**does not include 1,998,000 acre feet of dead storage below 3370 feet*

Glen Canyon Dam, Lake Powell

During water year 1975, Lake Powell was operated as part of the Colorado River storage project in accordance with governing compacts and laws to provide river regulation, optimum power production, recreational opportunities, and fish and wildlife benefits.

On September 30, 1974, Lake Powell water surface elevation was at 3,652 feet with an active storage of 18,010,000 acre-feet. During the fall and winter months, the reservoir water level remained fairly constant. Releases of water for hydropower generation were scheduled in the early spring to integrate surplus hydroelectric power from the Northwest with CRSP power production. The April-July 1975 runoff above the gage at Lees Ferry, Arizona, was 10.4 million acre-feet, or 133 percent of the 1906-68 average. A record high-water elevation occurred on July 25, 1975, when the reservoir contained 21,177,000 acre-feet of active storage, with the water surface at elevation 3,675 feet. That was about 8 feet higher than the former record in 1974. (Chart 6.)




STORAGE
WATER SURFACE ELEVATION (FEET)
3700
3600
3500
3400
3300
3200
3132
25
20
15
10
5
3
2
1
0
ACTIVE CONTENT (MILLION ACRE FEET)
LEGEND
MOST PROBABLE
UPPER QUARTILE
LOWER QUARTILE
MOST ADVERSE
OCT.
NOV.
DEC.
JAN.
FEB.
MAR.
APR.
MAY
JUNE
JULY
AUG.
SEP.
Water Year 1975
Water Year 1976

Lower Basin Reservoirs

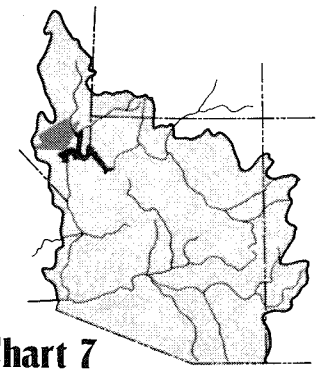


Chart 7

STATISTICS
ACTIVE STORAGE*

RESERVOIR	(ACRE-FEET)	ELEVATION (FEET)
MAXIMUM STORAGE	27,377,000	1229
RATED HEAD	13,653,000	1123
MINIMUM POWER POOL	10,024,000	1083
SURFACE AREA (FULL)	162,700 ACRES	
RESERVOIR LENGTH (FULL)	115 MILES	
POWER PLANT		
NUMBER OF UNITS	17	
TOTAL CAPACITY OF UNITS	1,344,800 KILOWATTS	

**does not include 2,378,000 acre-feet of dead storage below elevation 895 feet*

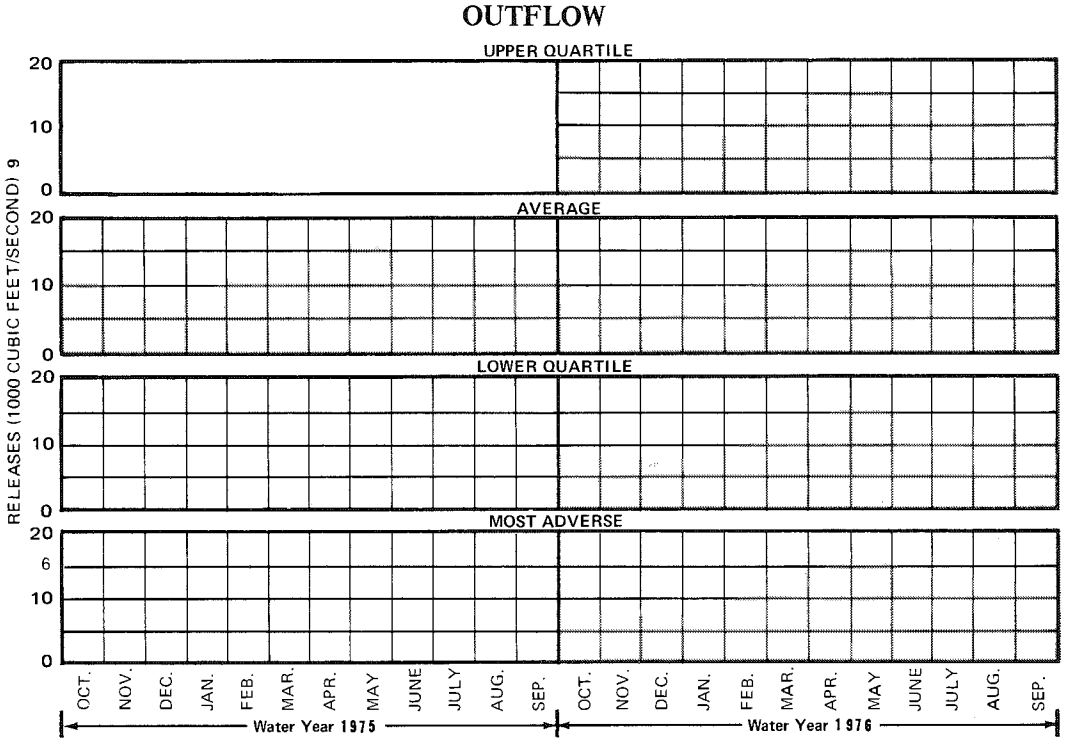
Hoover Dam, Lake Mead

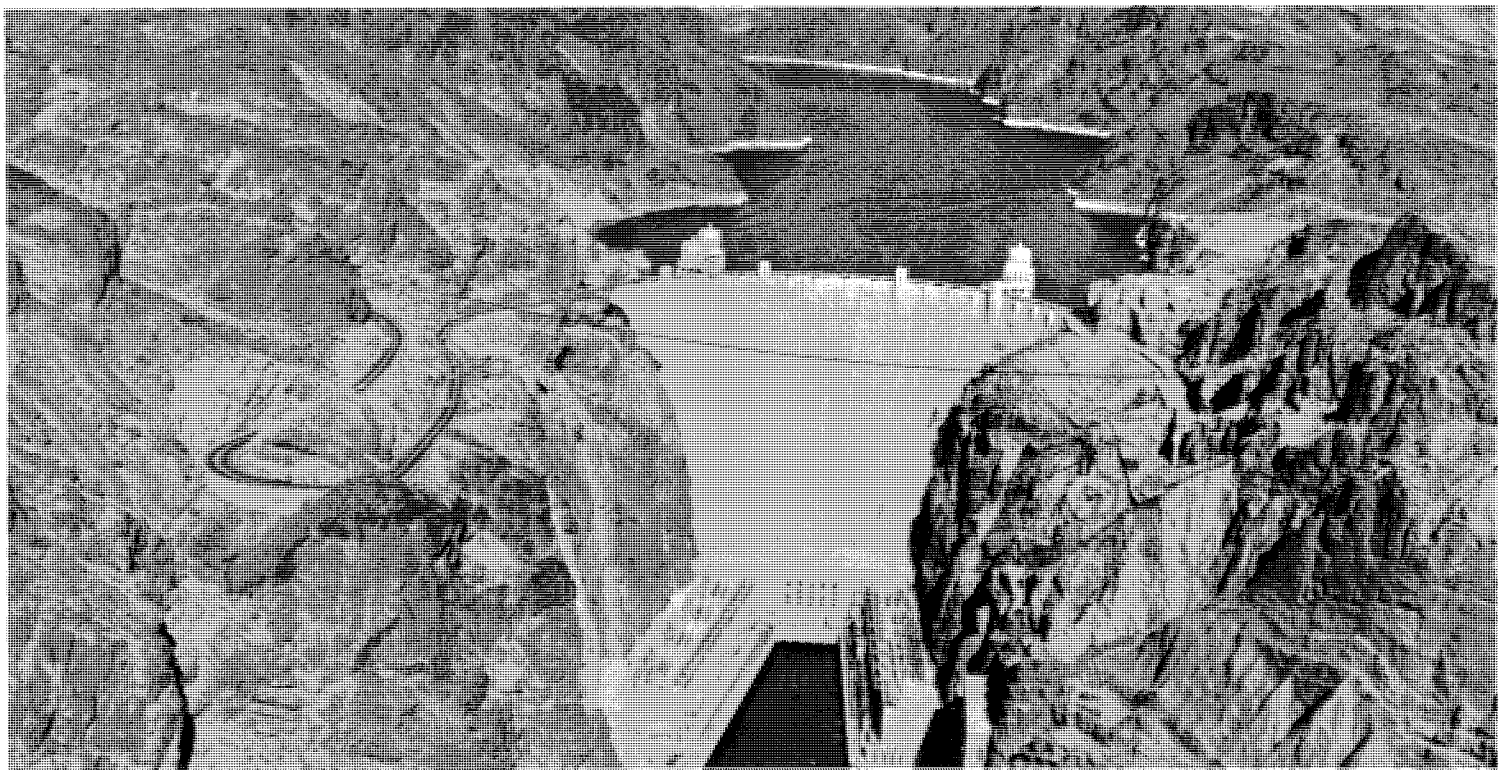
At the beginning of water year 1975, Lake Mead had a water surface elevation of 1,174 feet and an active storage of 19,358,000 acre-feet. During the water year, releases were made to meet downstream water use requirements in the United States and Mexico, programed levels of Lakes Mohave and Havasu, and transit losses which include river and reservoir evaporation, uses by phreatophytes, changes in bank storage, unmeasured inflows, and diversions. The total release from Lake Mead through Hoover Dam was 8,374,300 acre-feet. At the end of the water year, Lake Mead had a water surface elevation of 1,180 feet and an active storage of 20,154,000 acre-feet, which reflect an increase in storage during the water year of 796,000 acre-feet.

On September 30, 1975, the active storage of Lake Mead was 48,000 acre-feet less than the active storage in Lake Powell.

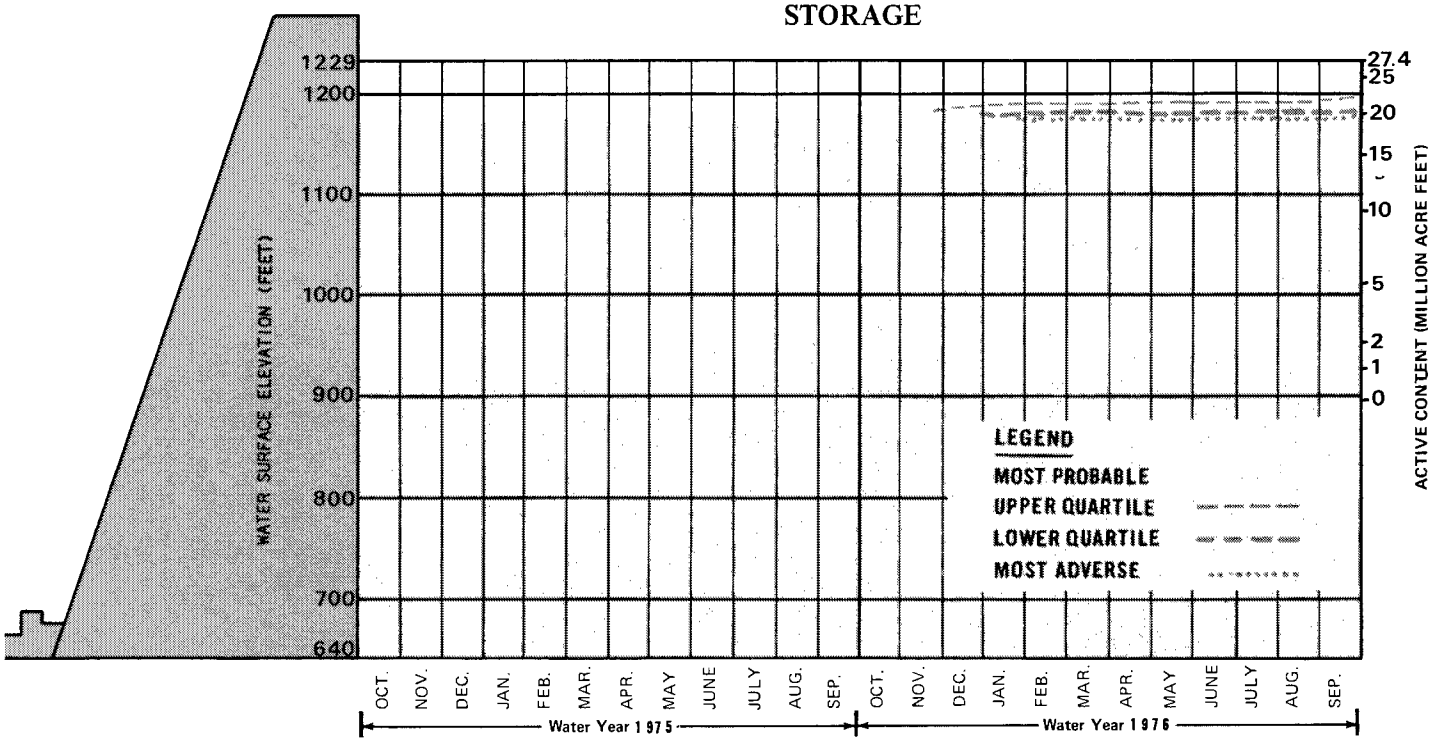
Because adequate space in Lake Mead and CRSP reservoirs was available during water year 1975, no additional releases at Hoover Dam were required pursuant to the flood control regulations. (Chart 7.)

Lake Mead is the only reservoir on the Colorado River in which a specified space is exclusively allocated for mainstream flood control. Flood control regulations have been published. These regulations take into account effective space in CRSP reservoirs as well as in Lake Mead.





STORAGE


WATER SURFACE ELEVATION (FEET)
1229
1200
1100
1000
900
800
700
640
27.4
25
20
15
10
5
2
1
0
ACTIVE CONTENT (MILLION ACRE FEET)
LEGEND
MOST PROBABLE
UPPER QUARTILE
LOWER QUARTILE
MOST ADVERSE
OCT.
NOV.
DEC.
JAN.
FEB.
MAR.
APR.
MAY
JUNE
JULY
AUG.
SEP.
Water Year 1975
Water Year 1976

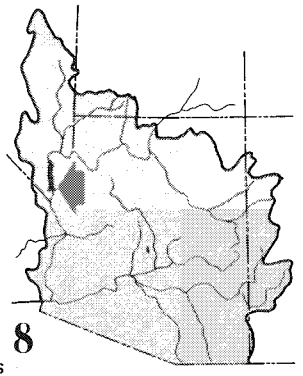


Chart 8

STATISTICS
ACTIVE STORAGE*

RESERVOIR	(ACRE-FEET)	ELEVATION FEET
MAXIMUM STORAGE	1,810,000	647.0
RATED HEAD	1,188,000	623.0
MINIMUM POWER	217,500	570.0
SURFACE AREA (FULL)	28,200 ACRES	
RESERVOIR LENGTH (FULL)	6 7 MILES	

POWER PLANT

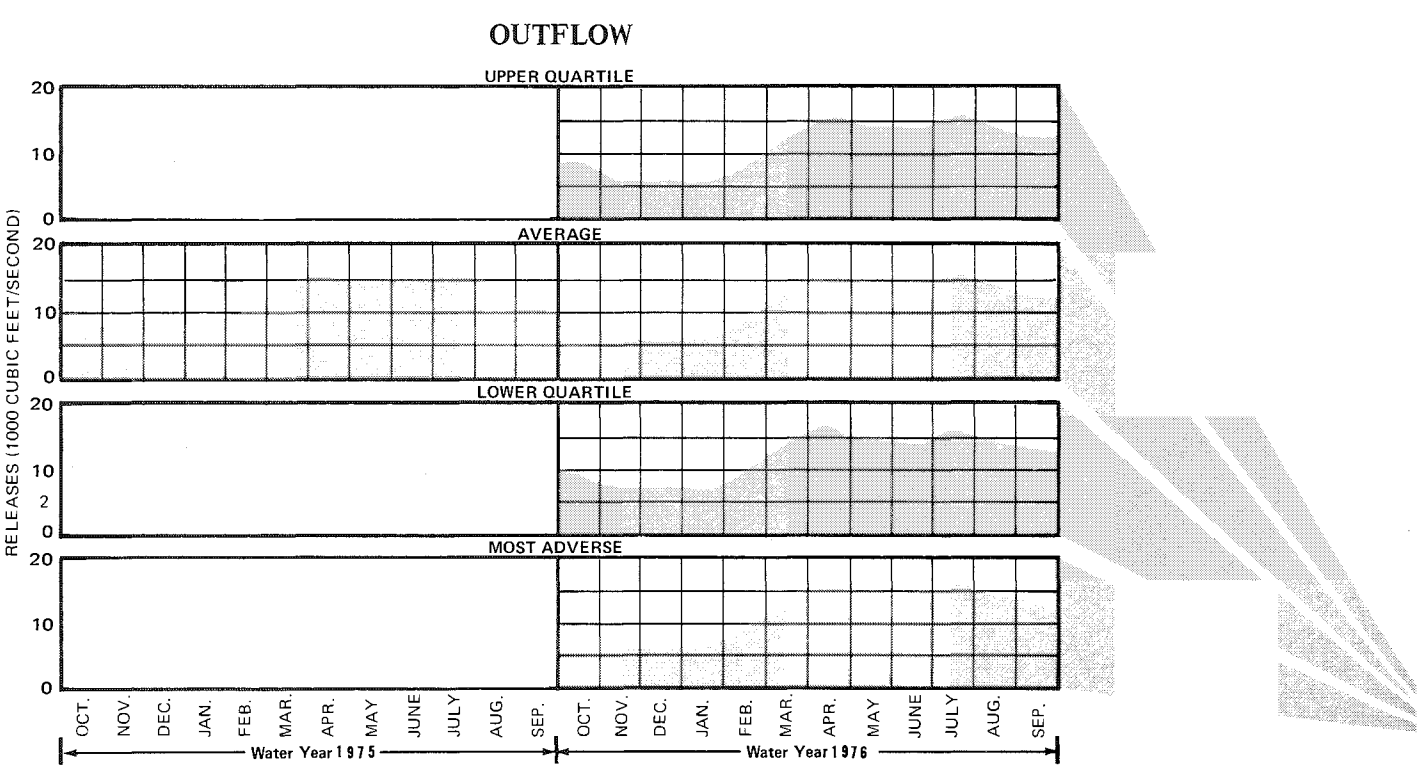
NUMBER OF UNITS	5
TOTAL CAPACITY OF UNITS	225,000 KILOWATTS

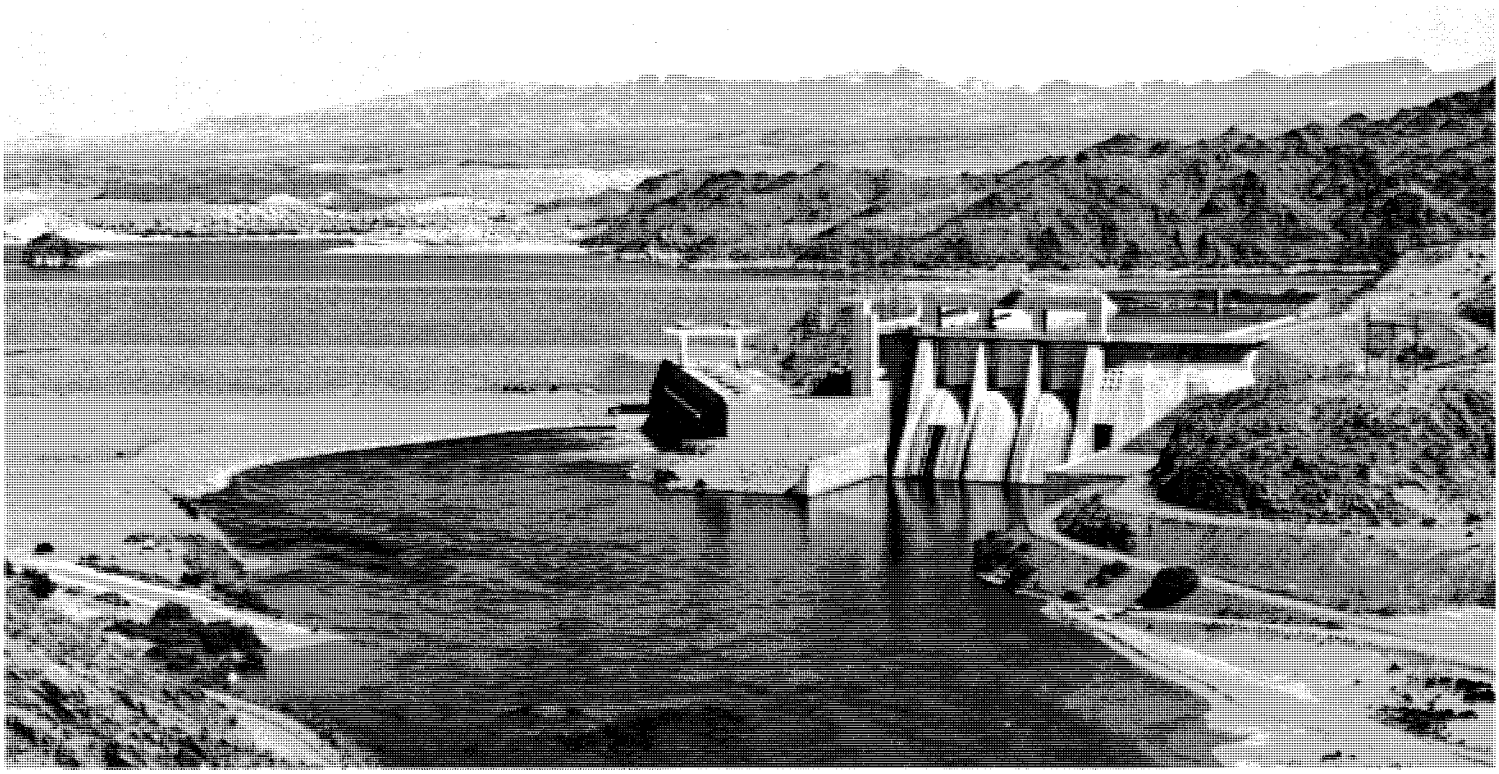
**does not include 8,530 acre-feet of dead storage below elevation 533.39 feet*

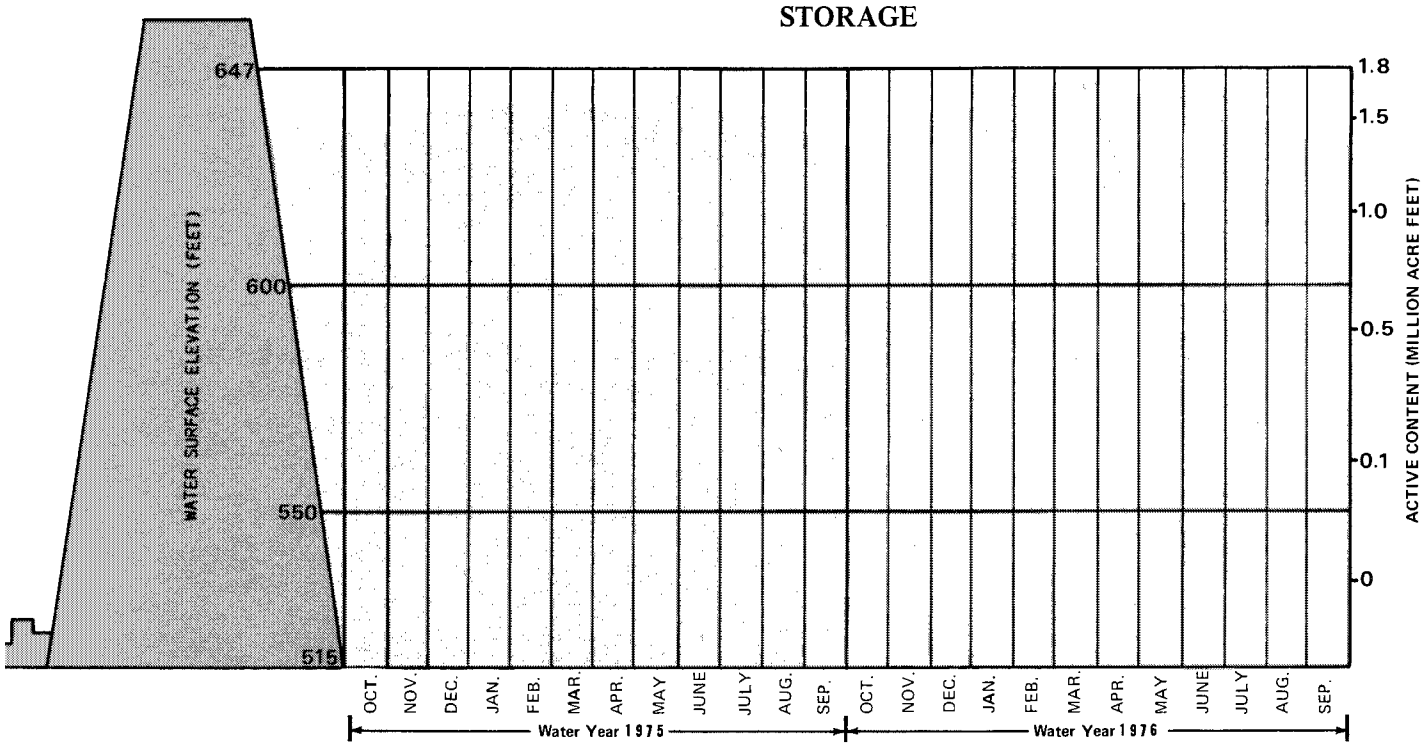
Davis Dam, Lake Mohave

At the beginning of water year 1975, the water surface elevation of Lake Mohave was 631 feet, with an active storage of 1,380,200 acre-feet. During the winter months, the water level was raised to approximately 641 feet by the end of February and maintained between that level and 637 feet through April. The highest water level was 642 feet with an active storage of 1,668,700 acre-feet on March 14, 1975, which is about the beginning of the heavy irrigation season. The water level was drawn down during the summer months to elevation 631 feet with an active storage of 1,385,400 acre-feet at the end of the water year.

Lake Mohave releases were made monthly to satisfy downstream requirements, with a small amount of reregulation by Lake Havasu. During the water year, 8,219,200 acre-feet were released at Davis Dam, all of which was passed through the turbines for power production. (Chart 8.)






STORAGE
WATER SURFACE ELEVATION (FEET)
647
600
550
515
1.8
1.5
1.0
0.5
0.1
0
ACTIVE CONTENT (MILLION ACRE FEET)
OCT.
NOV.
DEC.
JAN.
FEB.
MAR.
APR.
MAY
JUNE
JULY
AUG.
SEP.
Water Year 1975
Water Year 1976

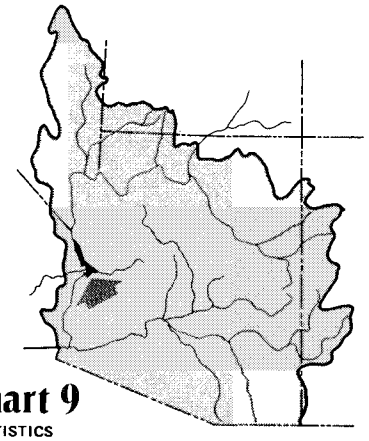


Chart 9

STATISTICS
ACTIVE STORAGE*

RESERVOIR	(ACRE-FEET)	ELEVATION (FEET)
MAXIMUM STORAGE	619,400	450.0
RATED HEAD	619,400	450.0
MINIMUM POWER	439,400	440.0
SURFACE AREA (FULL)	20,400 ACRES	
RESERVOIR LENGTH (FULL)	35 MILES	
POWER PLANT		
NUMBER OF UNITS	4	
TOTAL CAPACITY OF UNITS	120,000 KILOWATTS	

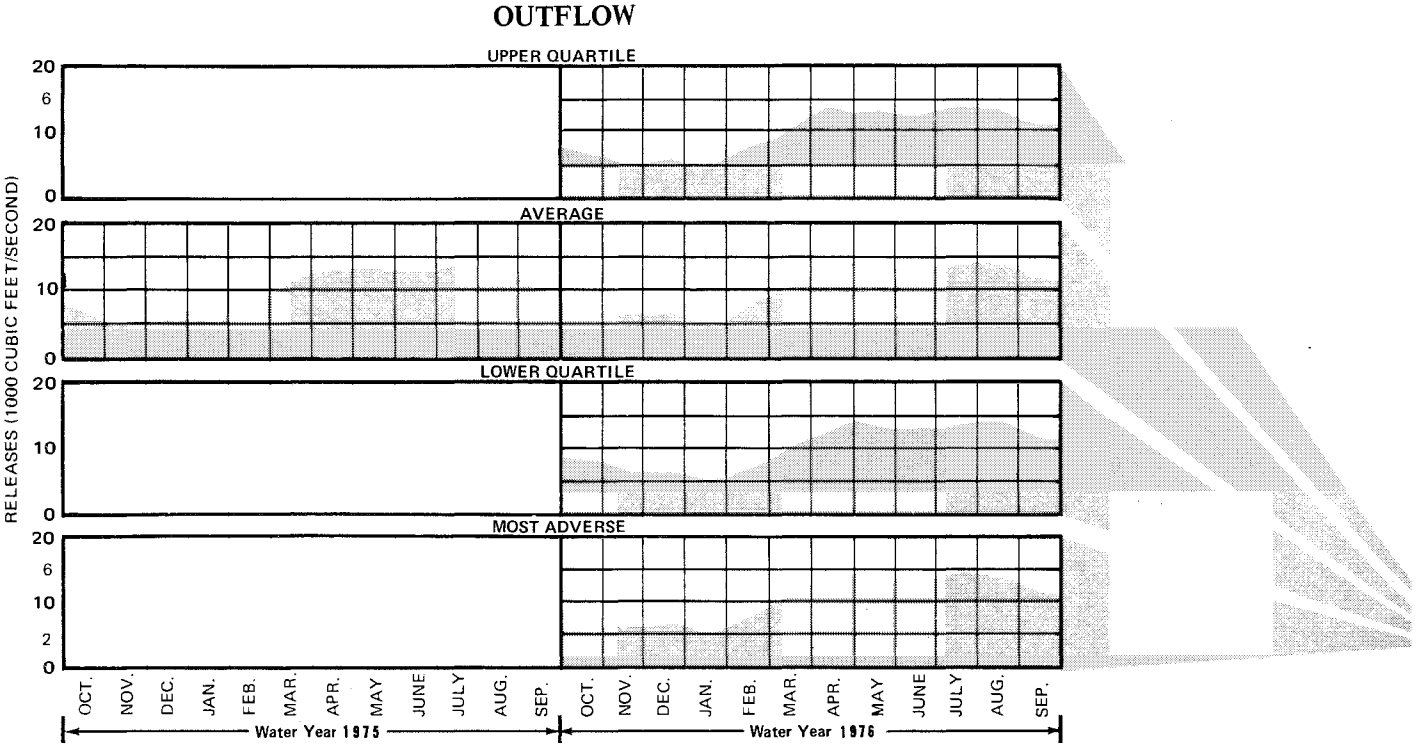
**does not include 28,600 acre-feet of dead storage below elevation 400.0 feet*

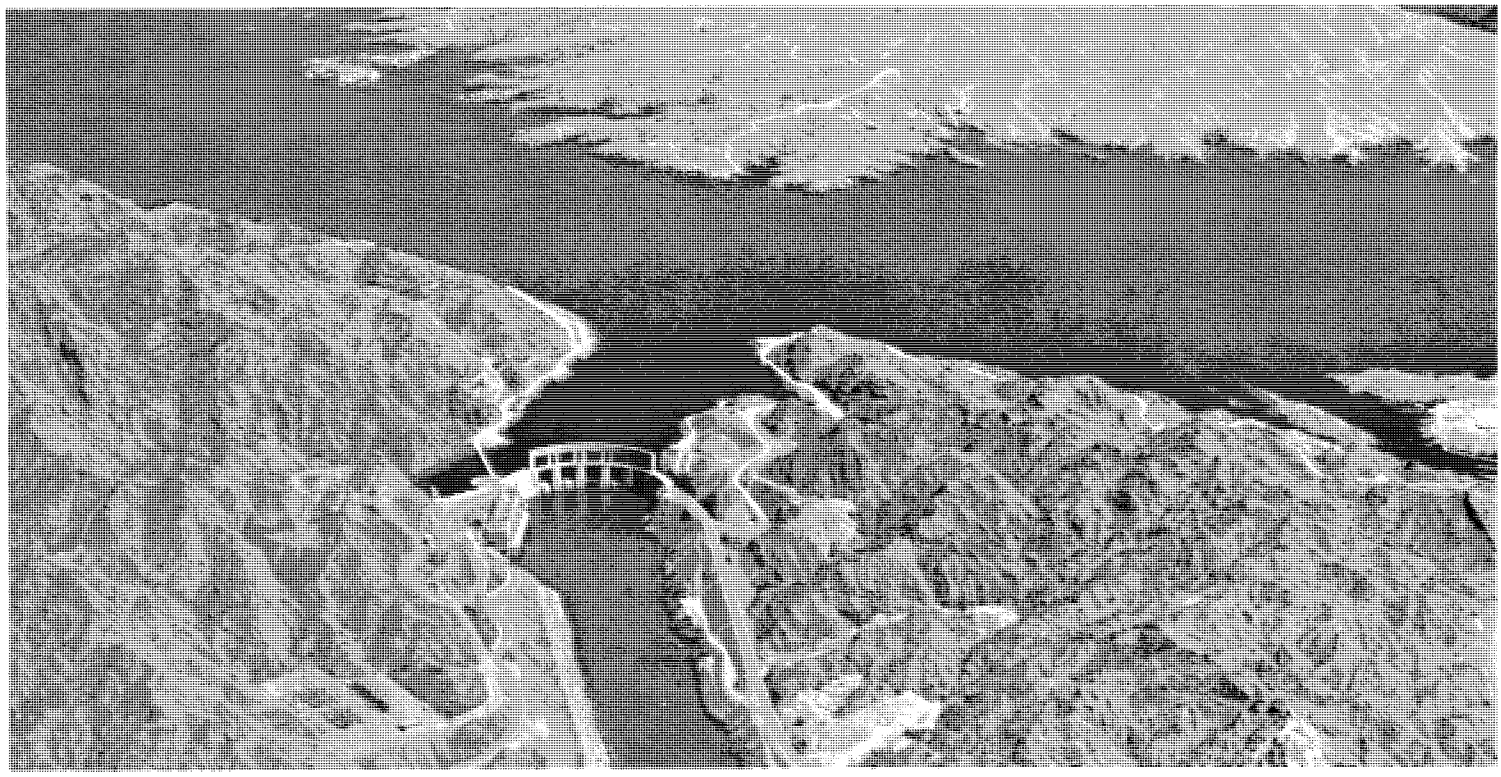
Parker Dam, Lake Havasu

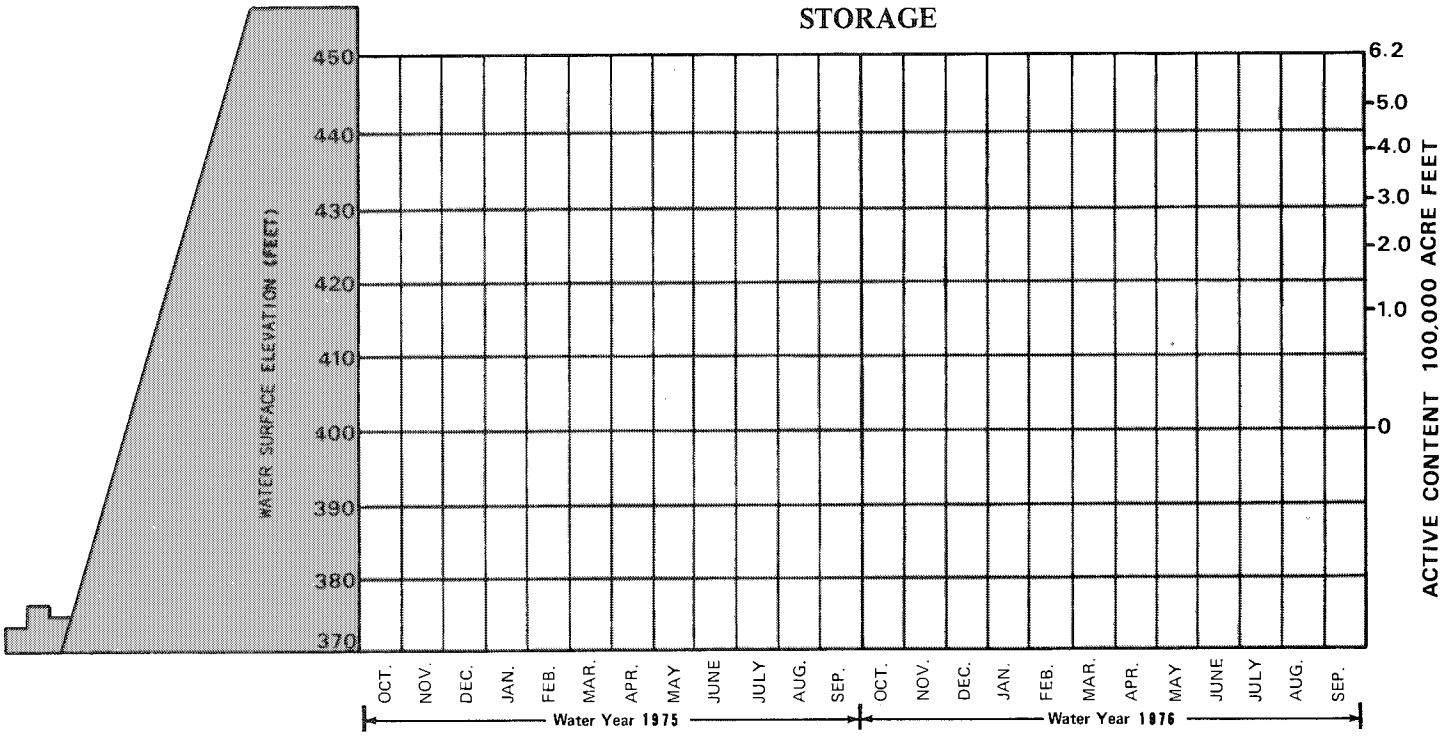
At the beginning of water year 1975, the water level of Lake Havasu was at elevation 447 feet, with an active storage of 559,400 acre-feet. The reservoir was drawn down to about elevation 445 feet with an active storage of about 529,200 acre-feet in December and remained near that level through mid-March to provide flood control space for runoff from the drainage area between Davis and Parker Dams. The water level was then raised to about elevation 450 feet by mid-May. During mid-May through June, the reservoir water level was maintained near maximum, with an active storage of about 605,000 acre-feet, and then was drawn down to 447 feet with an active storage of 569,400 acre-feet by the end of the water year.

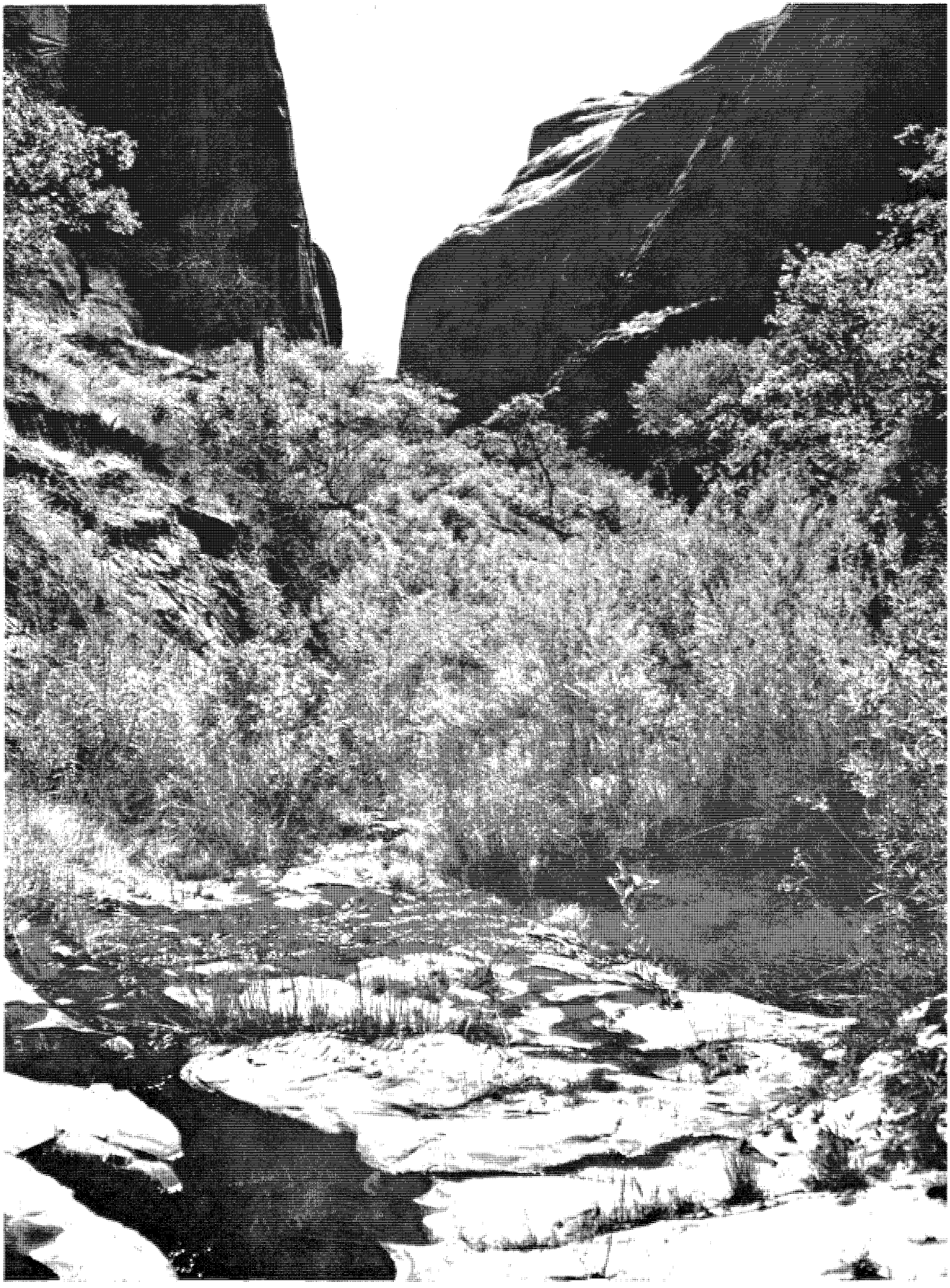
During the water year, 6,978,400 acre-feet were released at Parker Dam, all of which passed through the turbines for power production.

Joint-use space in the top 10 feet of Lake Havasu (about 180,000 acre-feet) is reserved by the United States for control of floods and other uses, including river regulation. Normally, only about the top 4 feet, or 77,000 acre-feet of space, are used for this purpose, now that Alamo Reservoir on the Bill Williams River is in operation. (Chart 9.)






STORAGE
WATER SURFACE ELEVATION (FEET)
450
440
430
420
410
400
390
380
370
6.2
5.0
4.0
3.0
2.0
1.0
0
ACTIVE CONTENT 100,000 ACRE FEET
OCT.
NOV.
DEC.
JAN.
FEB.
MAR.
APR.
MAY
JUNE
JULY
AUG.
SEP.
Water Year 1975
Water Year 1976



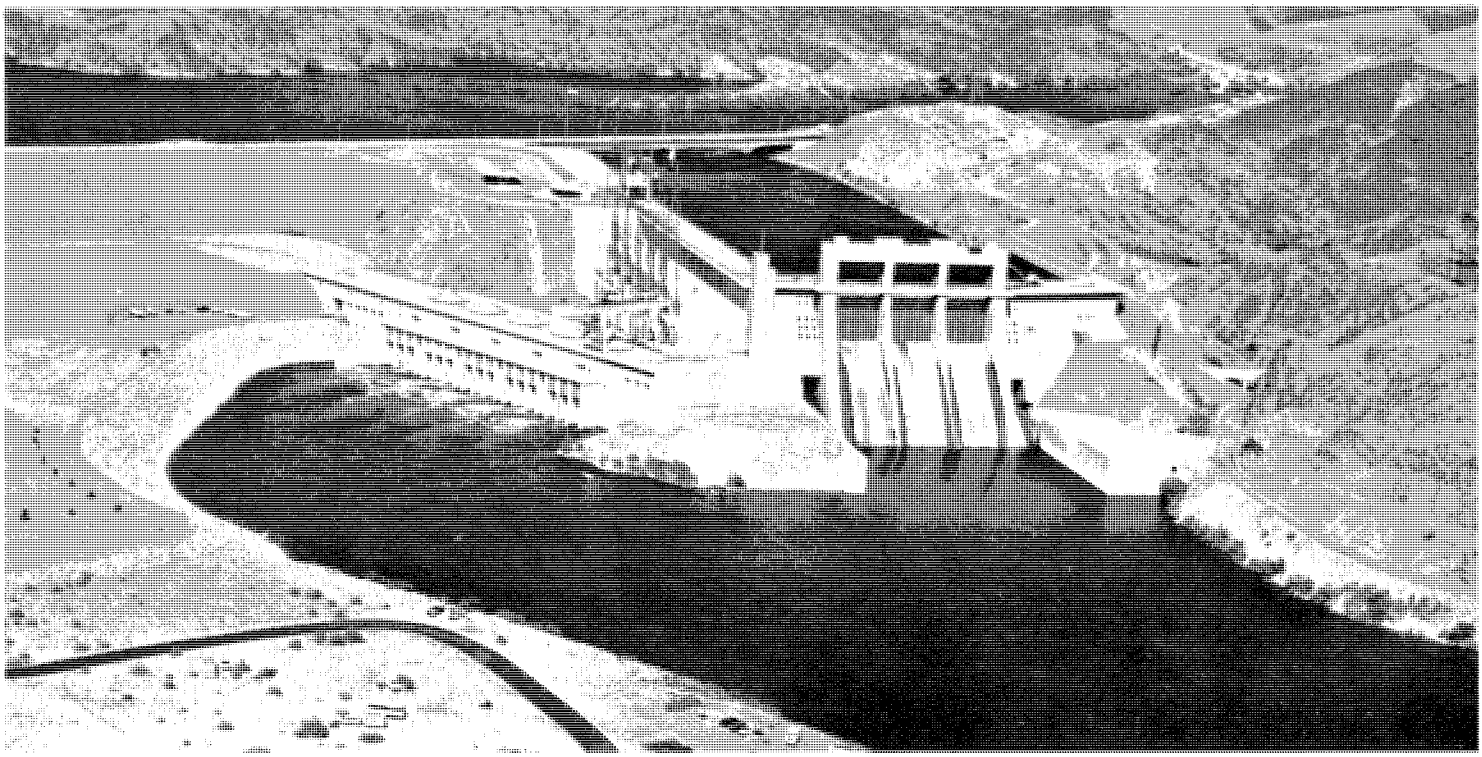
River Regulation

During water year 1975, 9,255,000 acre-feet were released from Glen Canyon Dam as measured at the Lees Ferry, Arizona, gaging station. For the 1-year and 10-year periods ending September 30, 1975, respectively, 9,274,000 acre-feet and 87,211,000 acre-feet passed the compact point at Lee Ferry, Arizona. The annual release of 9,687,000 acre-feet from Lake Powell scheduled for the year ending September 30, 1976, is based on the most probable runoff. When added to the flow of the Paria River this will result in Upper Basin delivery of about 89.0 million acre-feet for the 10-year period ending September 30, 1976, and will equate water storage in Lake Mead and Lake Powell.

Water releases scheduled for the Colorado River storage project and participating project reservoirs were planned to accommodate all of the multiple purposes for which the project was designed, in addition to the many day-to-day demands developed throughout the year.

Normally, daily releases are made from the storage reservoirs in the Lower Basin to meet the incoming orders of the water user agencies and all water passes through the turbines. The daily releases are regulated on an hourly basis to meet, as nearly as possible, the power loads of the electric power customers. Minimum daily flows are provided in the river to maintain fishery habitat. Adjustments to the normal releases are made when possible to provide more satisfactory conditions for water-oriented recreation activities, to provide transport for riverborne sediment to desilting facilities, and to provide a degree of control of water quality.

River regulation below Hoover Dam was accomplished in a manner which resulted in delivery to Mexico of 226,503 acre-feet in excess of minimum Treaty requirements during water year 1975. Of that quantity, 213,468 acre-feet were delivered for salinity control pursuant to provisions of minute No. 242 of the Mexican Treaty.



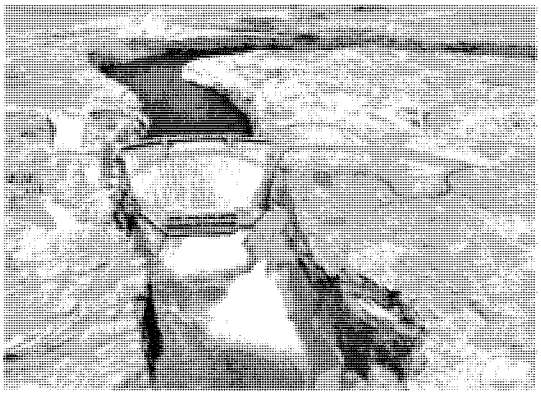
Beneficial Consumptive Uses

Upper Basin Uses

The three largest categories of depletion in the Upper Basin are agricultural use within the drainage basin, diversions for all purposes to adjacent drainage basins, and evaporation losses from all reservoirs.

During water year 1975, agricultural and M&I uses in the Upper Basin were estimated at 2,200,000 acre-feet. Approximately 673,000 acre-feet were diverted to adjacent drainage basins and approximately 630,000 acre-feet evaporated from main stem reservoirs in the Upper Basin. It is estimated that an additional 150,000 acre-feet evaporated from other reservoirs and stockponds in the Upper Colorado Basin, for a total depletion of 3,653,000 acre-feet.

Water is being stored in the Upper Basin reservoirs and will be released to the Lower Basin as specified by the Colorado River Basin Project Act and the laws, compacts, and treaties upon which section 602(a) of the act is based.

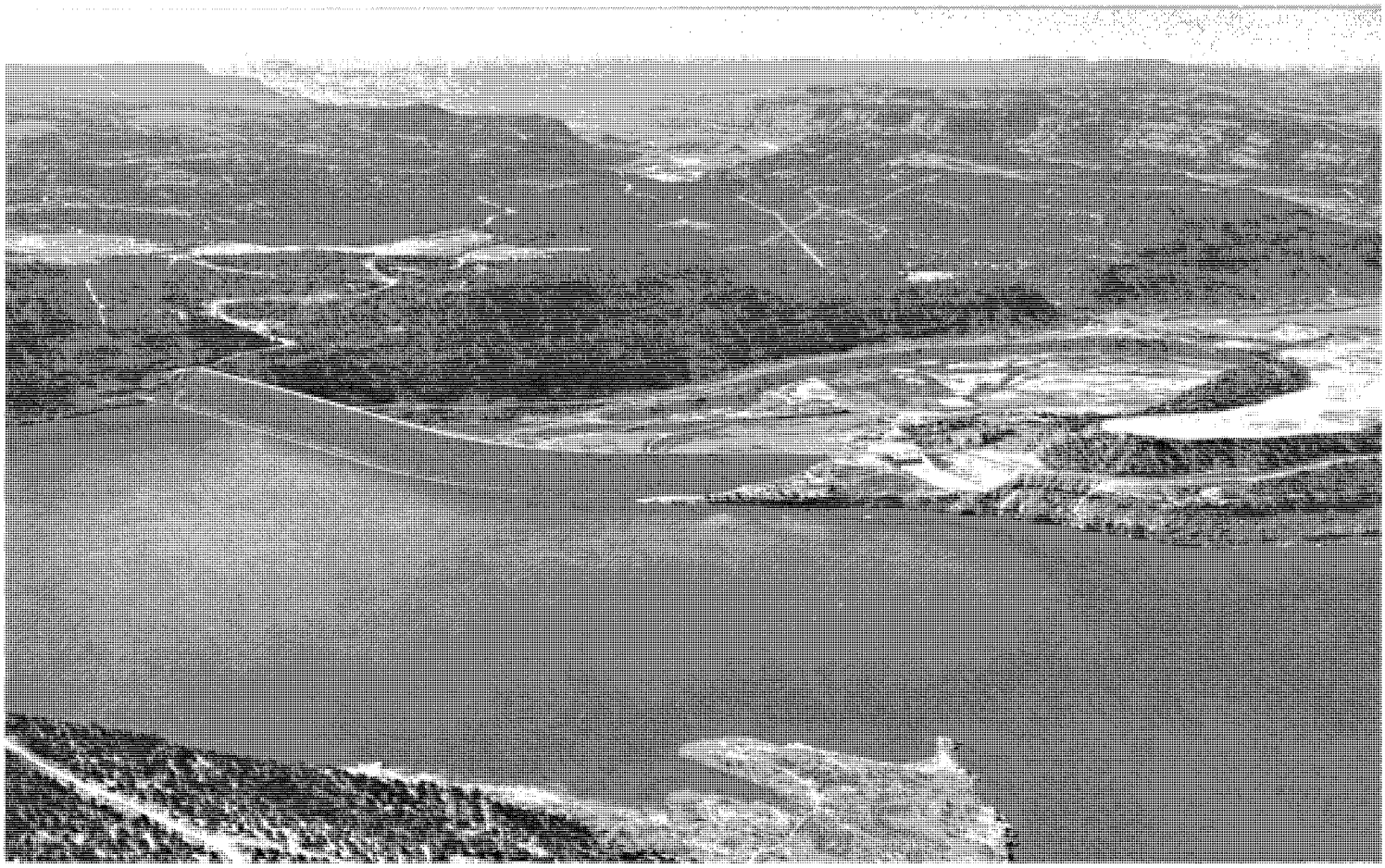


Lower Basin Uses and Losses

During water year 1975, releases of 6,978,400 acre-feet from Lake Havasu were made to meet the requirements for water deliveries at Imperial Dam, as well as those of the Colorado River Indian Reservation near Parker, Ariz., the Palo Verde Irrigation District near Blythe, Calif., other miscellaneous users along the river, and transit losses between Parker Dam and Imperial Dam. Deliveries to Mexico consisted of river water delivered to Imperial Dam and waste and drainage return flows from water users below Imperial Dam. Beneficial use of the small amount of regulatory storage space in Imperial, Laguna, and Senator Wash Reservoirs resulted in the minor regulatory waste of 13,035 acre-feet.

The major water diversion above Parker Dam was by Metropolitan Water District (MWD) of Southern California. MWD pumped 880,000 acre-feet from Lake Havasu during water year 1975, which included 8,619 acre-feet for delivery to the city of Tijuana, pursuant to a contract for temporary emergency delivery of a portion of Mexico's treaty entitlement. During water year 1975, releases of 8,219,200 acre-feet were made from Lake Mohave to provide for releases at Parker Dam; to supply diversion requirements of the MWD, miscellaneous contractors, and other users; to offset evaporation and other transit losses between Davis and Parker Dams; and to maintain the scheduled levels of Lake Havasu.

During water year 1975, releases of 8,374,300 acre-feet were made from Lake Mead at Hoover Dam to regulate the levels of Lake Mohave and to provide for the small uses and the losses from this reservoir. In addition, 81,000 acre-feet were diverted from Lake Mead for use by Lake Mead National Recreation Area, Boulder City, Basic Management, Inc., and contractors of the Division of Colorado River Resources, State of Nevada. During water year 1975, the total releases and diversions from Lake Mead were 8,455,300 acre-feet.



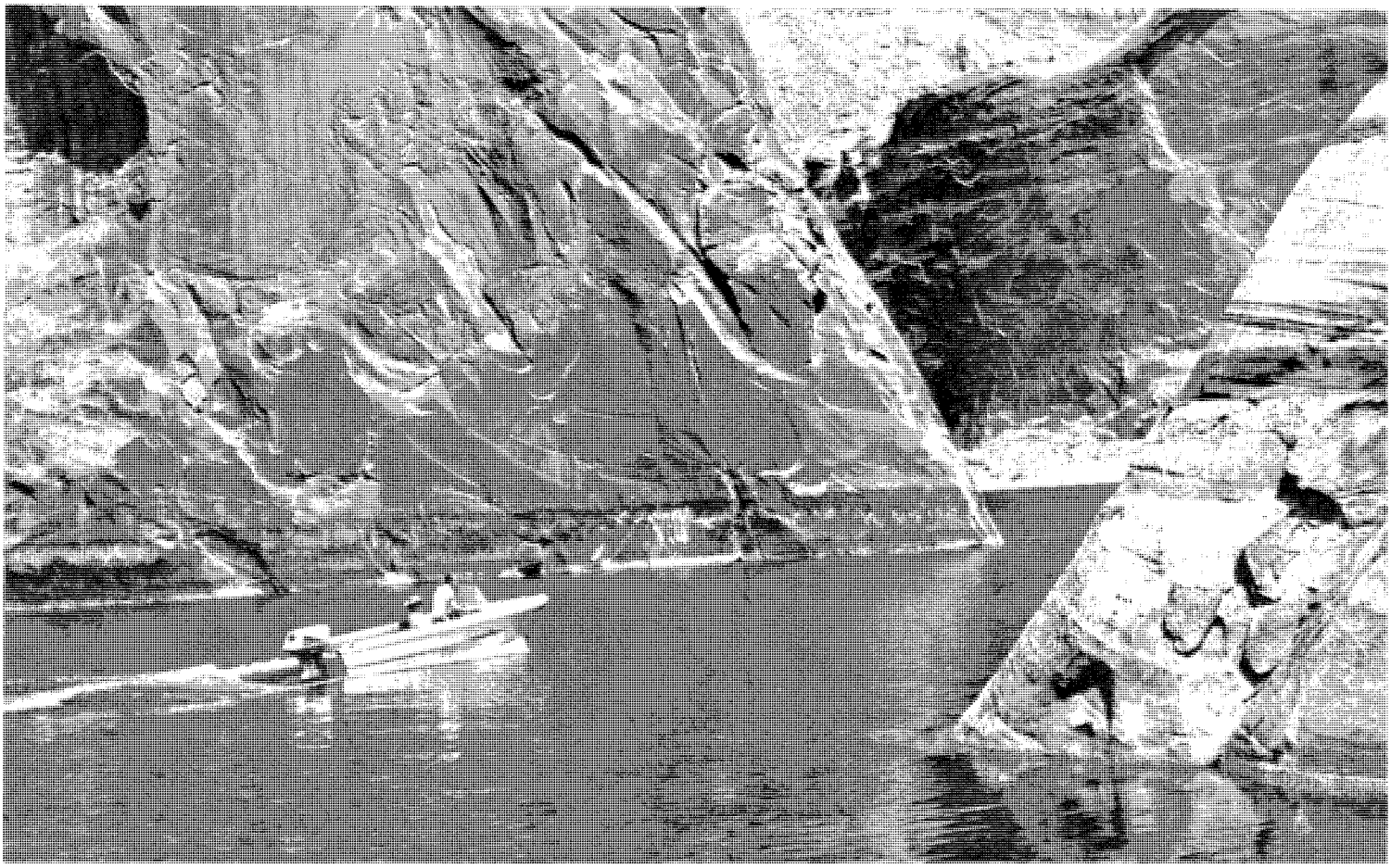
Water Quality Control

Water Quality Operations During Water Year 1975

Since water quality aspects of Colorado River operations are extensively described in the biennial series of reports entitled "Quality of Water, Colorado River Basin," only minimal discussion of this aspect of operation is presented in this report. Report No. 7 of the biennial series was issued in January 1975.

During water year 1975, the United States bypassed 213,468 acre-feet of drainage water to the Colorado River below Morelos Dam and replaced it with a like amount of other water, pursuant to minute No. 242 with Mexico. Even though this was the only specific operation carried out for quality purposes, other incidental benefits accrue to water quality from normal procedures. Water is stored in reservoirs during the nonirrigation season and during the snowmelt runoff period when it is surplus to immediate requirements. As the streamflows diminish in late summer, storage water is released to supplement the natural streamflows, thus diluting the more saline flows that would otherwise occur during late summer and fall. Although water quality control is not generally recognized as a beneficial use of surface water, water released for other purposes during normally low flow periods greatly enhances the quality of water in the Basin.

In recognizing the need to manage water quality of the Colorado River, it has been recommended that salinity increases in the river will be minimized through a water quality improvement program generally described in the Department of the Interior's report, "Colorado River Quality Improvement Program," dated February 1972. The program calls for a basin-wide approach to salinity control while the Upper Basin continues to develop its Compact-apportioned waters. To enhance and improve the quality of the river's water, Congress authorized the Colorado River Basin Salinity Control Act (P.L. 93-320), June 24, 1974.



Enhancement of Fish and Wildlife

Upper Basin

For the benefit of fish habitat, the interim operating rules for Fontenelle Reservoir provide a continuous flow of at least 300 ft^3/s in the channel immediately below Fontenelle Dam. During water year 1975, releases for power production and other purposes provided flows in excess of 600 ft^3/s.

Fishing below Flaming Gorge Dam has been enhanced by maintaining a minimum of 800 ft^3/s in the river.

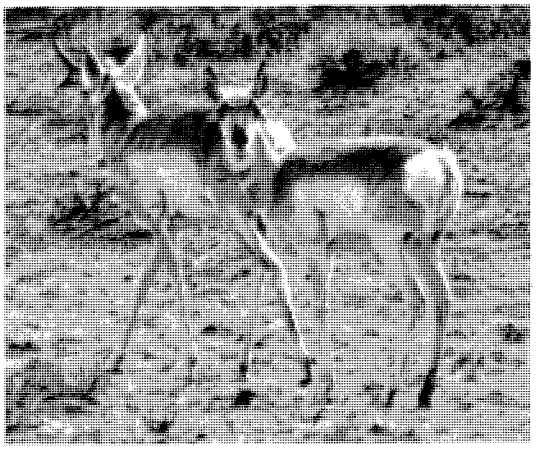
A release of at least 61 ft^3/s throughout the winter 1974-75 assured good fish habitat in the river between Taylor Park and Blue Mesa Reservoirs. Coordinated operation between Taylor Park and Blue Mesa Reservoirs in delivering irrigation water to the Uncompahgre project provided additional fishery and recreational opportunities between the two reservoirs. The interim operating rules specify a minimum of 200 ft^3/s to maintain fish habitat below Morrow Point Dam and below the Gunnison Tunnel.

A continuous flow of at least 400 ft^3/s was maintained immediately below Navajo Dam for fish propagation.

Clear water and a minimum release of 1,000 ft^3/s provided good habitat for fish in the river below Glen Canyon Dam.

Lower Basin

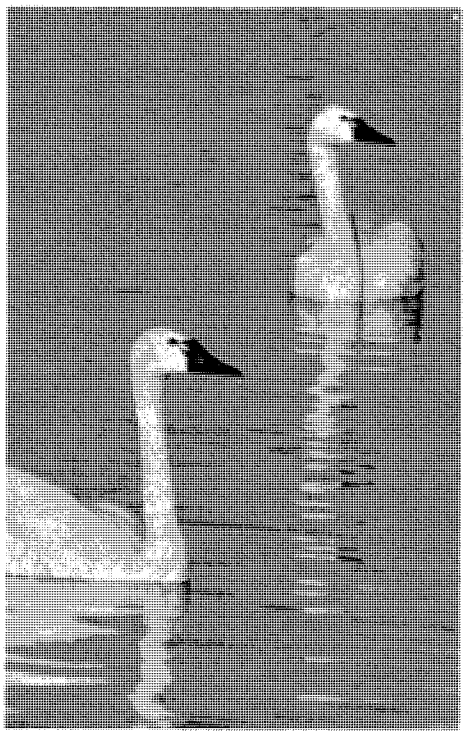
Lake Mead water levels were regulated to the maximum extent possible, consistent with other uses, to provide a stable or rising water surface during the bass spawning season. To provide satisfactory fish habitat along the lower river, releases from Lakes Mohave and Havasu were regulated so that minimum flows below the dams were never less than 1,880 ft^3/s.

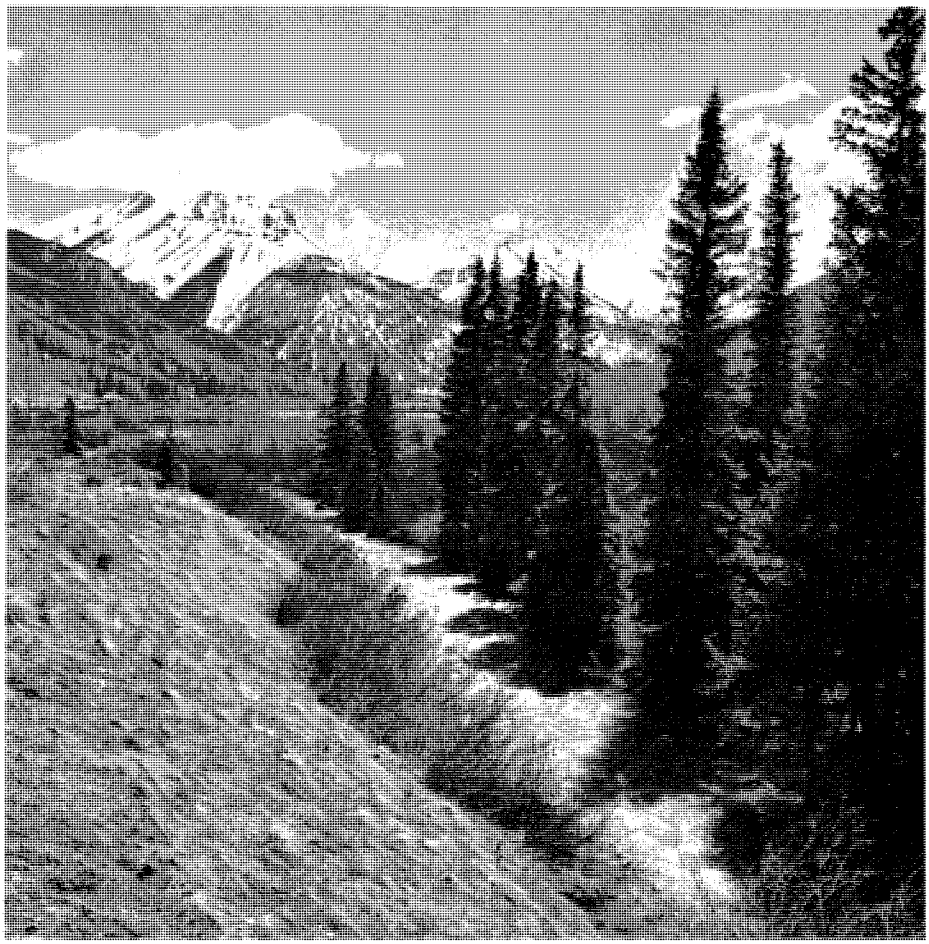


Preservation of Environment

Preservation or enhancement of environment is a matter of the highest importance in the planning, construction, and operation of all Colorado River storage features. Contracts for water services, grants of rights-of-way and indentures of leases for use of Federal land, supply contracts, and participating agreements approved by the Secretary of the Interior include language to control water and air pollution, to require restoration and reseeding of lands scarred by construction and operation activities, and to encourage conservation of the aesthetic beauty of nature.

Operation of the reservoirs of the Colorado River system schedules releases from Fontenelle Reservoir so the flow pattern will not adversely affect the ecology of downstream geese-nesting areas. Minimum flows are maintained below all dams to provide a desirable habitat for fish, animal, and plant life. Flood control operations at Navajo Reservoir and Lake Mead protect the downstream channels and flood plans from erosion and scouring during periods of high flow. Recent proposals for several large thermal-electric generating plants cooled with water and for coal gasification plants utilizing water from Reclamation facilities in the Colorado River system have required special consideration to protect the environment and ecology of the area. The Secretary of the Interior's responsibility for pollution control has been dele-





gated to the Commissioner of Reclamation and redelegated to the Regional Director of the Upper Colorado Region. The Regional Director of the Lower Colorado Region has been delegated responsibility for pollution control at the Mohave Powerplant.

Reclamation is presently involved in a Federal-State study to evaluate, among other things, the effects of reservoir operation on the Lake Mead bass fishery. The study is scheduled for completion in 1977 and should provide valuable information to help protect and enhance Lake Mead's environment.

Periodic dredging in Topock Marsh, part of Havasu National Wildlife Refuge, provides improved habitat for waterfowl such as the endangered Yuma clapper rail species. Topock Marsh is one of many created along the river by Reclamation projects.

The Bureau of Reclamation is also currently involved in the preparation of the "Environmental Impact Assessment of the Operation of Lake Powell under the Long-Range Operating Criteria." The assessment will cover the historical background and project plan, a description of the present operating program, a description of the environment, and environmental impacts on present and alternative operations.

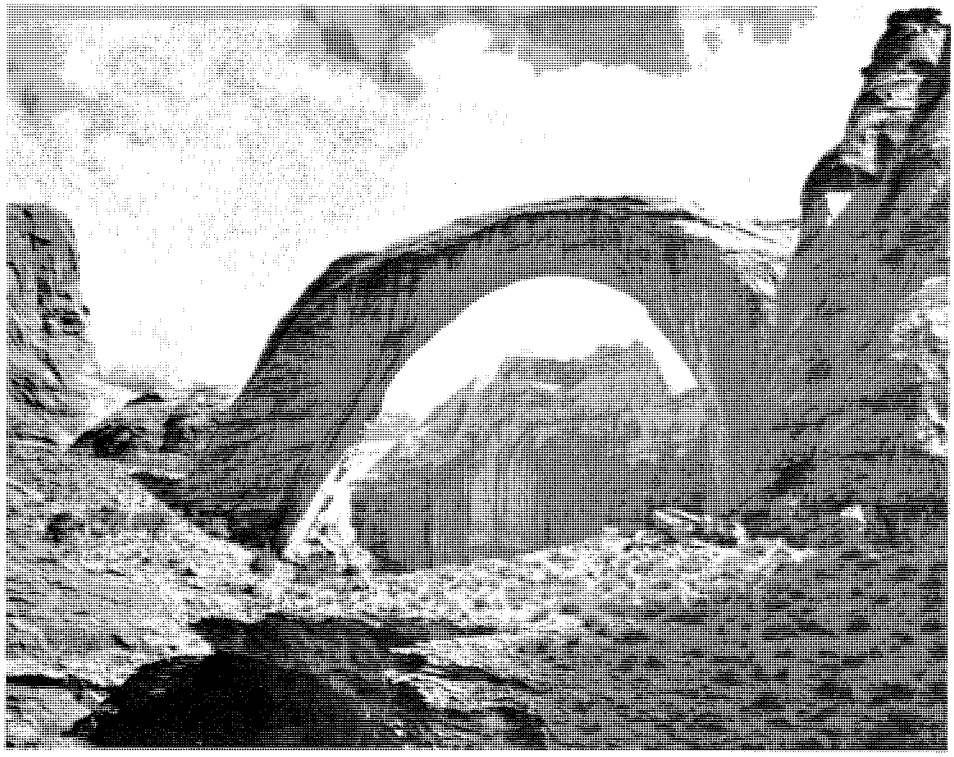
Projected Plan of Operation Under Criteria for Current Year

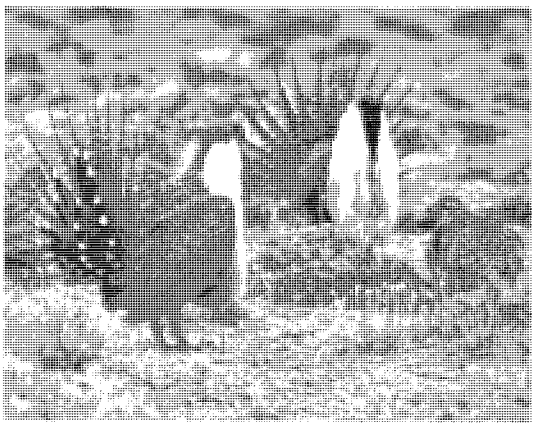
Determination of "602(a) Storage"

Section 602(a)(3) of the Colorado River Basin Project Act of September 30, 1968 (P.L. 90-537), provides for the storage of Colorado River water not required to be released under articles III(c) and III(d) of the Colorado River Compact in Upper Basin reservoirs to the extent the Secretary finds it to be reasonably necessary to assure Compact deliveries without impairment of annual consumptive uses in the Upper Basin. Article II of the "Criteria for Coordinated Long-Range Operation of Colorado River Reservoirs," pursuant to the act, provides that the annual plan of operation shall include a determination by the Secretary of the quantity of water considered necessary as of September 30 of the current year to be in storage as required by section 602(a) of P.L. 90-537 after consideration of all applicable laws and relevant factors including, but not limited to: (a) historic streamflows; (b) the most critical period of record; (c) probabilities of water supply; (d) estimated future depletions in the Upper Basin, including the effects of recurrence of critical periods of water supply; (e) the "Report of the Committee on Probabilities and Test Studies to the Task Force on Operating Criteria for the Colorado River," dated October 30, 1969, and such additional studies as the Secretary deems necessary; (f) the necessity to assure that Upper Basin consumptive uses are not impaired because of failure to store sufficient water to assure deliveries under section 602(a)(1) and (2) of P.L. 90-537.

Taking into consideration these and other relevant factors, the Secretary has determined that the active storage in Upper Basin reservoirs forecast for September 30, 1976, on the basis of average runoff during the current year, exceeds the "602(a) Storage" requirement under any reasonable range of assumptions which might be realistically applied to those items which he is directed to consider in establishing this storage requirement. Therefore, the accumulation of "602(a) Storage" is not the criterion governing the release of water during the current year. The Lake Powell active storage forecast for September 30, 1976, is scheduled to be about equal to the Lake Mead active storage forecast for that date.

The plan of operation during the current year based on average conditions is to release about



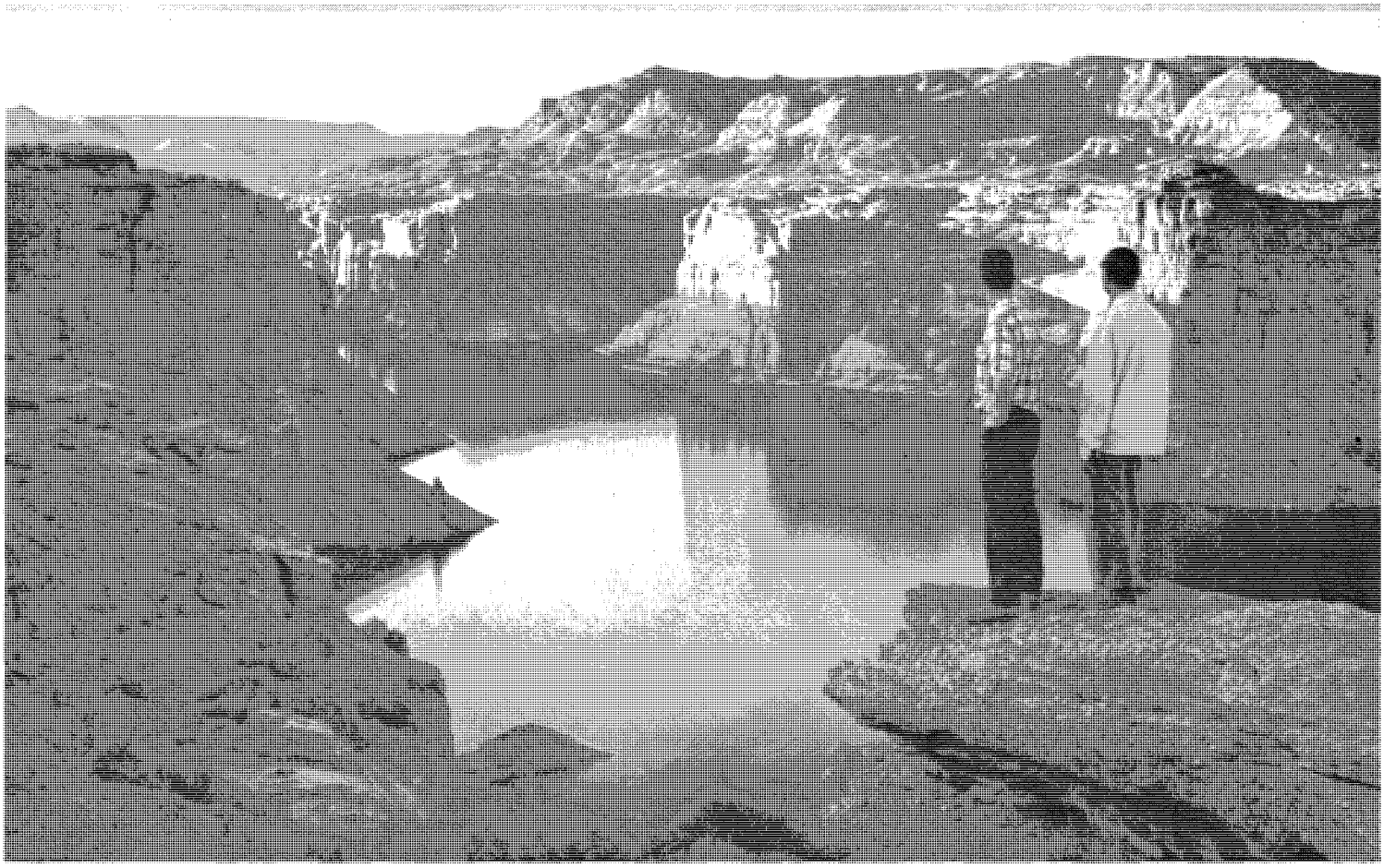


Lower Basin Requirements

9,687,000 acre-feet of water from Lake Powell, in accordance with section 602(a) (3) of Public Law 90-537.

Mexican Treaty Obligations

Annual calendar year schedules of monthly deliveries of water in the limitrophe section of the Colorado River, allotted in accordance with the Mexican Water Treaty signed in 1944, are formulated by the Mexican Section and presented to the United States Section, International Boundary and Water Commission, before the beginning of each calendar year. Upon 30 days' advance notice to the United States Section, Mexico has the right to modify, within the total schedule, any monthly quantity prescribed by the schedule by not more than 20 percent of the monthly quantity. In addition to the 1.5 million acre-feet of scheduled Treaty deliveries, approximately 15,000 acre-feet are projected for regulatory wastes and approximately 191,000 acre-feet of Wellton-Mohawk drainage water will be bypassed around Morelos Dam, Mexico's diversion structure, pursuant to minute No. 242.



Consumptive Use and Losses

For water year 1976, a release of 6,930,000 acre-feet from Lake Havasu has been projected, including consumptive use requirements in the United States below Parker Dam, transit losses in the river between Parker Dam and the Mexican Border, and treaty deliveries to Mexico.

During water year 1976, the Metropolitan Water District of Southern California is expected to divert 804,000 acre-feet by pumping from Lake Havasu, including a contract delivery of 9,600 acre-feet to the city of Tijuana as a part of Mexico's treaty delivery.

Consumptive use by small users, river losses or gains, and reservoir losses between Davis Dam and Parker Dam are projected to be 246,000 acre-feet.

There are no major users between Hoover Dam and Davis Dam. During water year 1976, consumptive use by small users, river losses or gains, and reservoir losses between Hoover Dam and Davis Dam are projected to be a net gain of 90,000 acre-feet.

During water year 1976, the net diversions from Lake Mead are projected at 81,000 acre-feet. Evaporation from Lake Mead is expected to be about 890,000 acre-feet, and net gain between Glen Canyon Dam and Lake Mead is expected to be about 882,000 acre-feet.

Regulatory Wastes

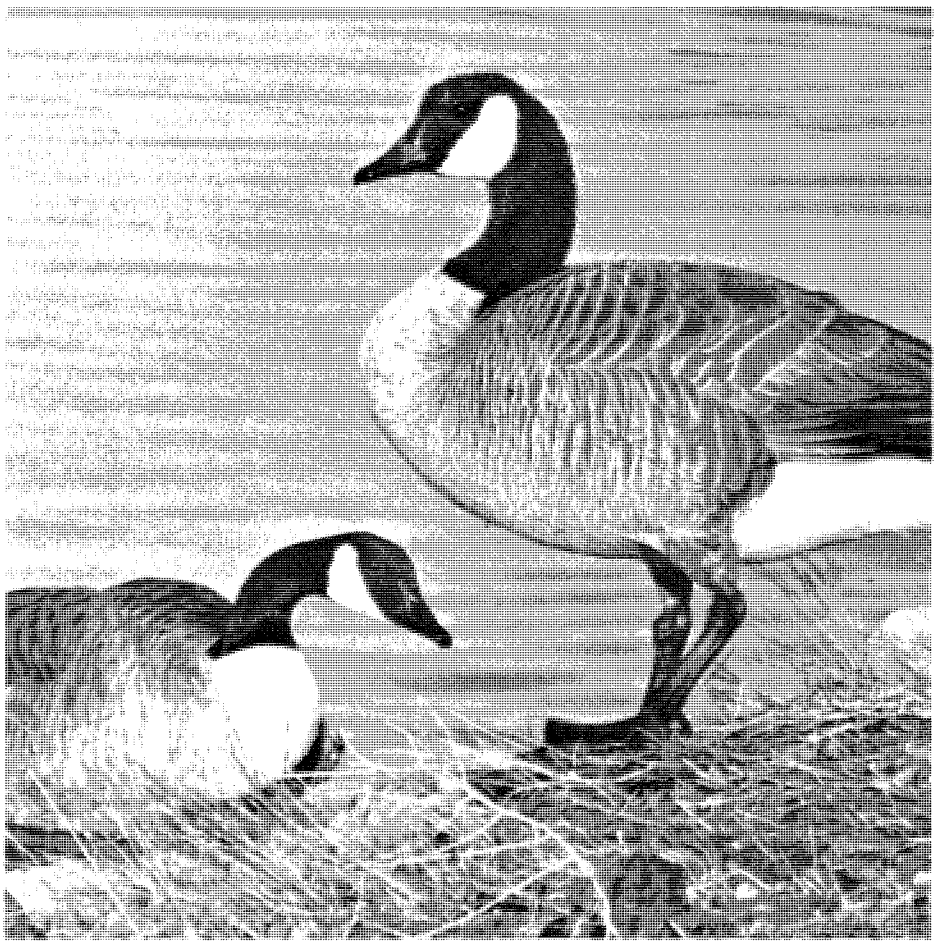
A regulatory waste of 15,000 acre-feet has been projected as being lost from the Lower Colorado River for water year 1976, as indicated in this section under Mexican Treaty obligations.

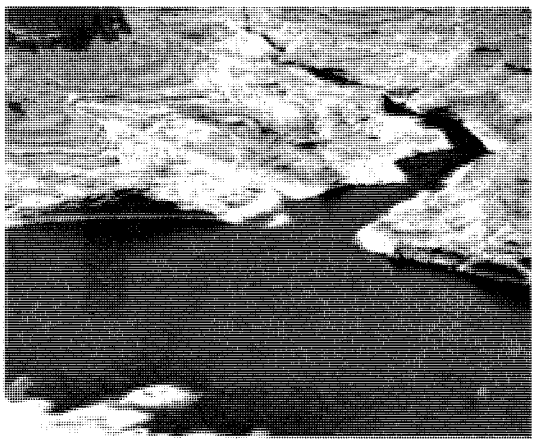
The guides set forth in the "Report on Reservoir Regulations for Flood Control Storage at Hoover Dam and Lake Mead" are in effect, but no flood control releases are anticipated for water year 1976.

Plan of Operation—Water Year 1976

For average runoff conditions during water year 1976, the projected operation of each of the reservoirs in the Colorado River Basin is described in the following paragraphs. Charts 1 through 9 show hydrographs of the projected monthly outflow from the reservoirs and the projected end-of-month elevation and active storage in the reservoirs for average and three other assumptions of 1976 modified runoff from the Basin. The four assumptions are: (1) AVERAGE based on the 1906-68 record of runoff, (2) UPPER QUARTILE based on flows exceeded 25 percent of the time during 1906-68, (3) LOWER QUARTILE based on flows exceeded 75 percent of the time during 1906-68, and (4) MOST ADVERSE based on the lowest year of record, which occurred in 1934.

The projected releases from Lake Powell are 8.23 million acre-feet for the most adverse assumed runoff conditions. The lower quartile, average, and upper quartile assumed runoff conditions would cause a splitting of storage condition between Lake Mead and Lake Powell, and releases from Lake Powell would be 8.5, 9.7 and 10.7 million acre-feet, respectively. The lower quartile, average, and upper quartile Lake Powell release would cause Lake Mead to rise 2 feet, 10 feet, and 16 feet higher at the end of the current year than the level reached by the most adverse condition. The projected operations of Lake Mohave and Lake Havasu are the same under all four of the runoff assumptions.





Upper Basin Reservoirs

Fontenelle

The reservoir water level will be lowered through the fall and winter months until a water surface elevation of about 6,480 feet is reached. With average runoff during the spring months, Fontenelle Reservoir will fill by the end of June. After the spring runoff, the reservoir level will be controlled by adjusting the releases through the powerplant to slowly reduce the elevation to 6,502 feet by the end of the summer of 1976. (Chart 1.)

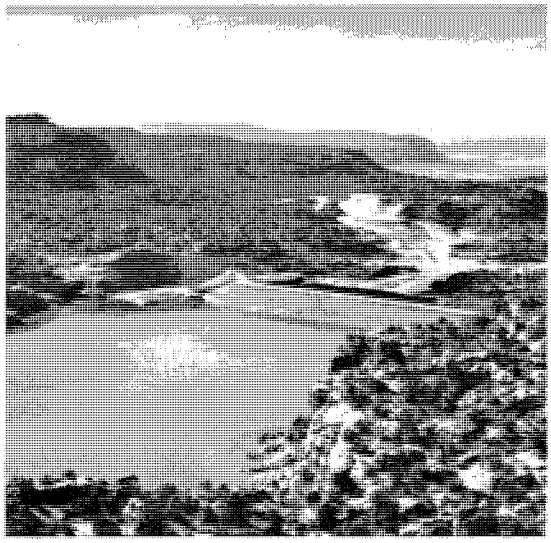
Flaming Gorge

At the beginning of water year 1976, the active storage in Flaming Gorge Reservoir was 3,650,000 acre-feet, with a water surface at elevation 6,037 feet. The reservoir level will be lowered about 10 feet by March of the current year, but should remain high enough until the spring runoff so boats can be launched from all of the nine boat ramps. Average inflow would cause the reservoir to reach elevation 6,035 feet with an active storage of 3,530,000 acre-feet. Summertime flow in the river below the dam should not exceed 4,500 ft^3/s and would not be less than 800 ft^3/s. Releases should average about 150,000 acre-feet per month through September 1976 for a water year total of about 1,900,000 acre-feet. (Chart 2.)

Curecanti Unit

During the current year, the water level in Blue Mesa Reservoir should reach a low in March 1976 at elevation 7,464 feet and the active storage would be 400,000 acre-feet. With average inflow during the spring of 1976, the reservoir should fill at elevation 7,519 feet with an active storage of 830,000 acre-feet. At that elevation the reservoir has a surface area of 9,180 acres and a reservoir length of 24 miles. (Charts 3 and 4.)

Morrow Point Reservoir will be operated near full during the current year. Releases of a minimum flow of 200 ft^3/s will be made below the Gunnison Tunnel Diversion Dam for downstream irrigation requirements, power production, and river regulation.

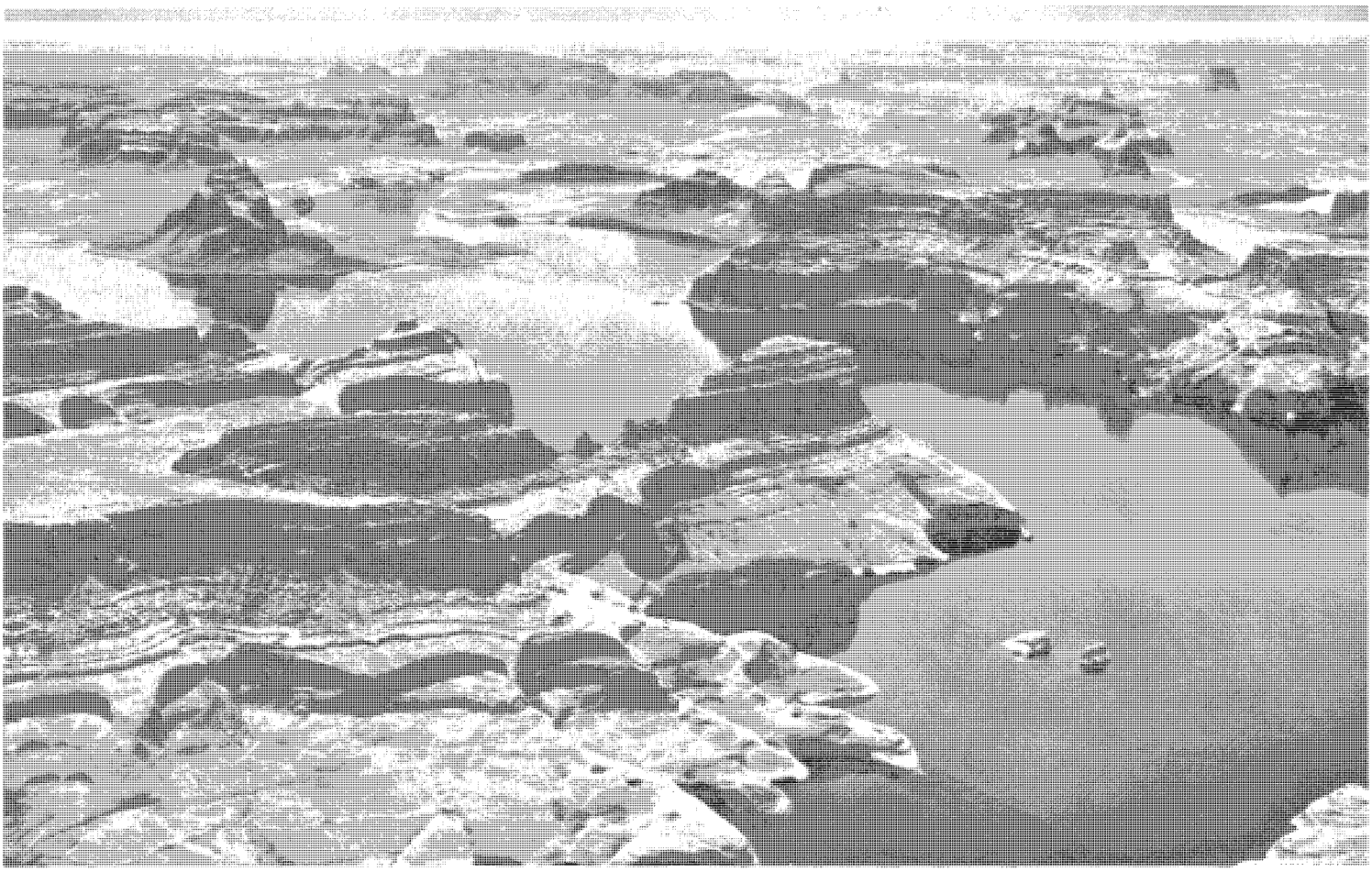


Navajo Reservoir

On September 30, 1975, Navajo Reservoir had an active storage of 1,390,000 acre-feet with water surface elevation at 6,064 feet. During October through March, releases will be controlled to lower the reservoir elevation to 6,030 feet prior to spring runoff. At elevation 6,030 feet, Navajo Reservoir will have an extra 50,000 acre-feet of storage in anticipation of the initial water release for the Navajo Indian irrigation project. Average inflow would cause the reservoir to reach elevation 6,059 feet, with an active storage of 1,330,000 acre-feet. The reservoir will be maintained at or near this level throughout the remainder of the summer to enhance recreational use. (Chart 5.)

Glen Canyon–Lake Powell

For the current year, the level of Lake Powell should drop about 4 feet during the fall and winter months to elevation 3,663 feet. The active storage would be 19.5 million acre-feet. Assuming an average April-July 1976 runoff, the resulting inflow of about 8.0 million acre-feet should cause the lake to reach an all-time high elevation of 3,681 feet during July, with an active storage of 22.1 million acre-feet, or approximately 88 percent of the active capacity of the reservoir. The lake would have a length of 185 miles and a water surface area of 148,150 acres. Assuming average conditions during water year 1976, a total release of 9.7 million acre-feet is scheduled from Lake Powell to satisfy storage requirements for Lake Mead and Lake Powell, in compliance with section 602 of Public Law 90-537. The scheduled release will pass through the turbines to generate power for customers in the Colorado River Basin States. (Chart 6.)



Lower Basin Reservoirs

Lake Mead

During the 1976 water year, the Lake Mead water level is scheduled to remain at about elevation 1,188 feet to enhance the bass spawn and survival conditions. At that level, the lake will have an average active storage of about 21.2 million acre-feet. During water year 1976, a total of 8.1 million acre-feet is scheduled to be released from Lake Mead to meet all downstream requirements. All releases are scheduled to pass through the turbines for electric power production. (Chart 7.)

Lake Mohave

The water level of Lake Mohave is scheduled to rise through the fall and winter months and reach elevation 643 feet by February 29, 1976. It should remain near that yearly high elevation through May 1976. Because of the heavy irrigation use during the summer months, the water level in Lake Mohave is expected to be drawn down to elevation 631 feet by the end of the water year 1976. During that time a total of 8.2 million acre-feet is scheduled to be released from Lake Mohave to meet all downstream requirements. All releases are scheduled to pass through the turbines for electric power production. (Chart 8.)

Lake Havasu

Lake Havasu is scheduled at the highest levels consistent with the requirements for maintaining flood control space. The yearly low elevation of 446 feet is scheduled for the December through February high flood-hazard period. The yearly high of 449 feet is scheduled for the low flood-hazard months of May and June. During water year 1976, a total of 7.0 million acre-feet is scheduled to be released from Lake Havasu to meet all downstream requirements. All releases are scheduled to pass through the turbines for electric power production. (Chart 9.)

As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering the wisest use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historical places, and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to assure that their development is in the best interests of all our people. The Department also has a major responsibility for American Indian reservation communities and for people who live in Island Territories under U.S. administration.

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