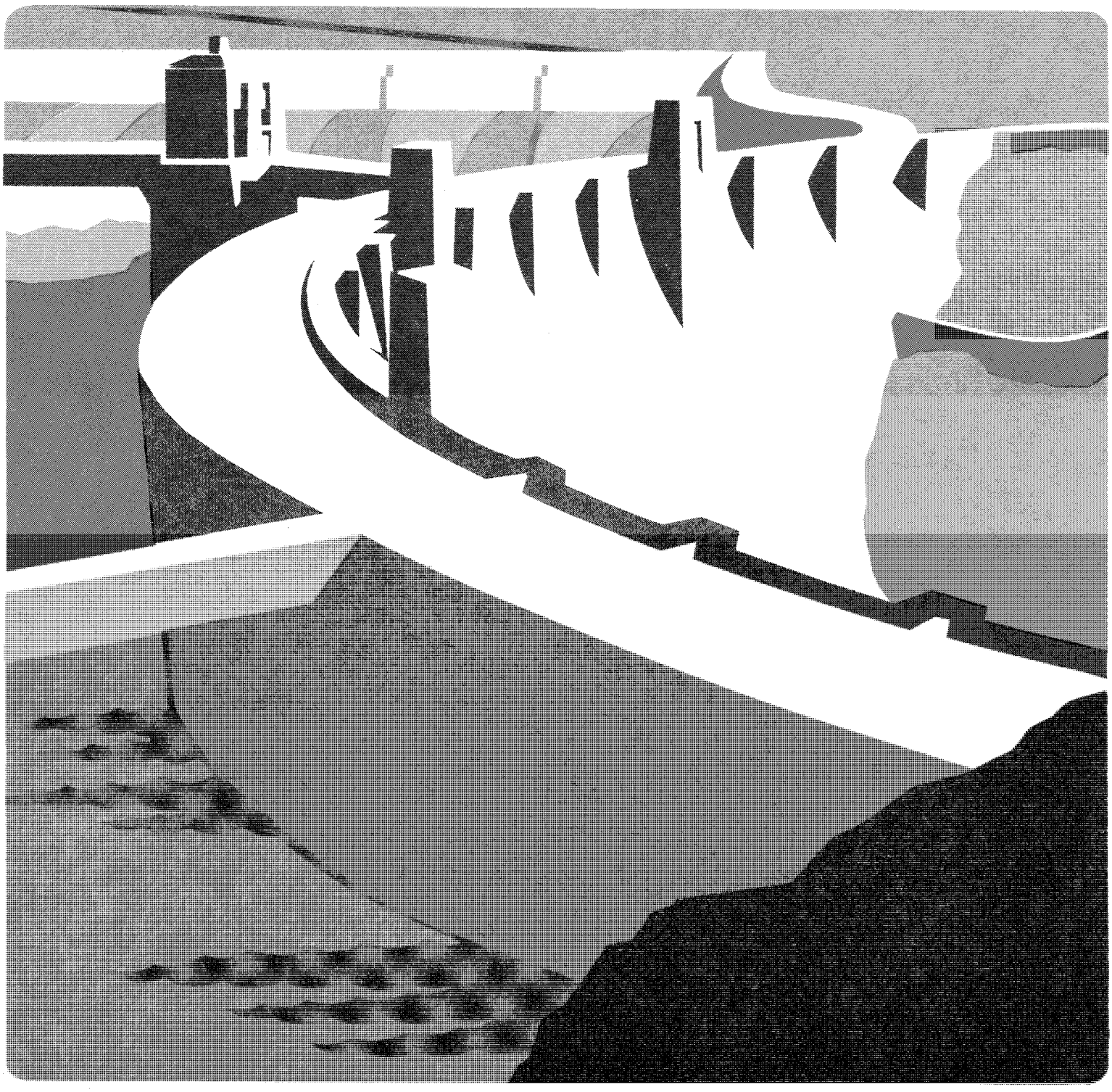
12th Annual Report

Operation of the Colorado River Basin 1982 Projected Operations 1983



Colorado River Basin

Contents

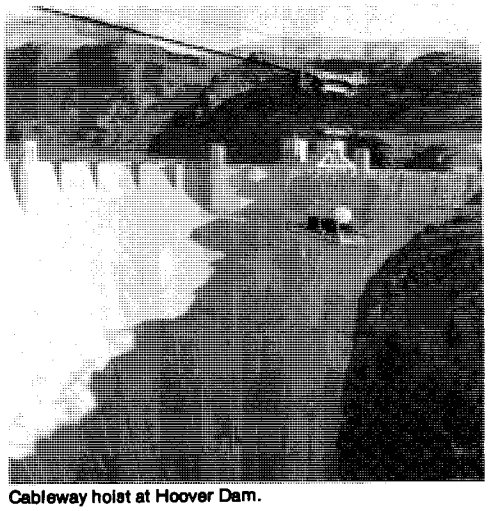
U.S. Department of the Interior

Bureau of Reclamation

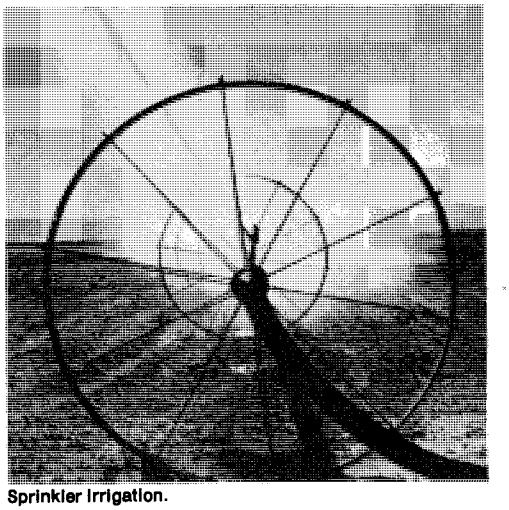
January 1983

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

Generators at Morrow Point Powerplant.

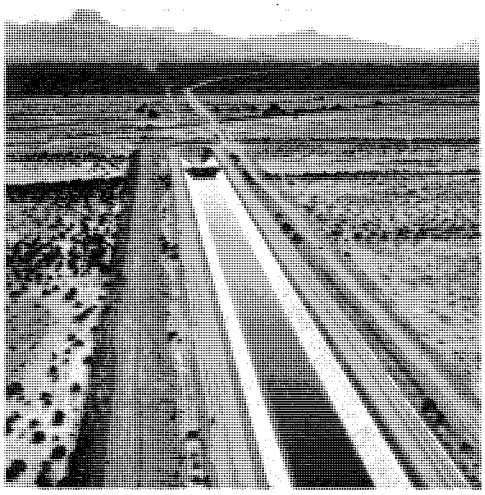


Cableway hoist at Hoover Dam.



Sprinkler irrigation.

Introduction



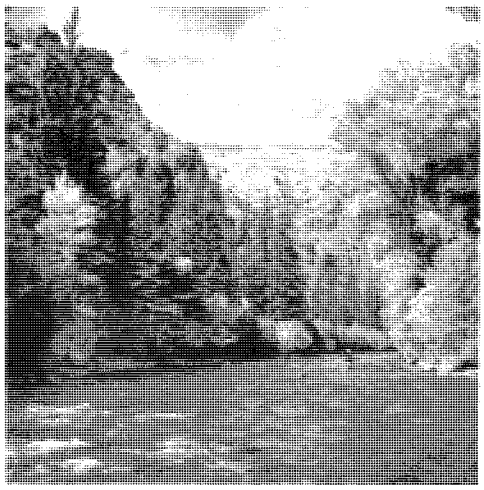
Granite Reef Aqueduct.

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

Storage and release of water from the Upper Basin reservoirs are governed by all applicable laws and agreements concerning the Colorado River, including the impoundment and release 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.

Nothing in this report is intended to interpret the provisions of the Colorado River Compact (45 Stat. 1057), the Upper Colorado River Basin Compact (63 Stat. 31), the Water Treaty of 1944 with the United Mexican States (Treaty Series 994, 59 Stat. 1219), the decree entered by the Supreme Court of the United States in Arizona v. California, et al. (376 U.S. 340), the Boulder Canyon Project Act (45 Stat. 1057), the Boulder Canyon Project Adjustment Act (54 Stat. 774; 43 U.S.C. 618a), the Colorado River Storage Project Act (70 Stat. 105; 43 U.S.C. 620), or the Colorado River Basin Project Act (82 Stat. 885; 43 U.S.C. 1501).

Authority for Report



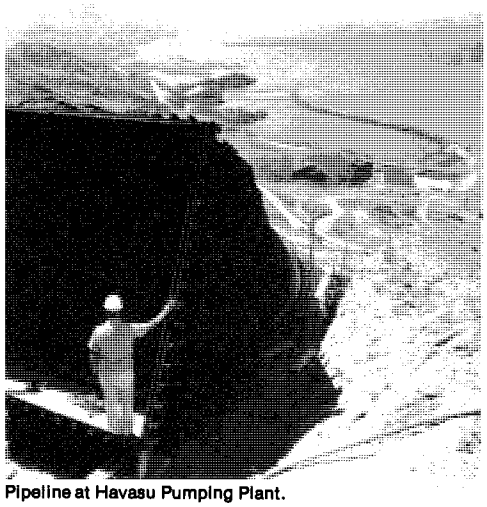
Taylor River above Blue Mesa Reservoir.

Pursuant to the Colorado River Basin Project Act (Public Law 90-537) of 1968, I am pleased to present to the Congress, and to the Governors of the Colorado River Basin States, the twelfth annual report on the Operation of the Colorado River Basin.

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 1982 and the projected operation of these reservoirs during water year 1983 under the "Criteria for Coordinated Long-Range Operation of Colorado River Reservoirs," published in the Federal Register June 10, 1970.

James G. Watt, Secretary
United States Department of the Interior

Actual Operations Under Criteria-Water Year 1982

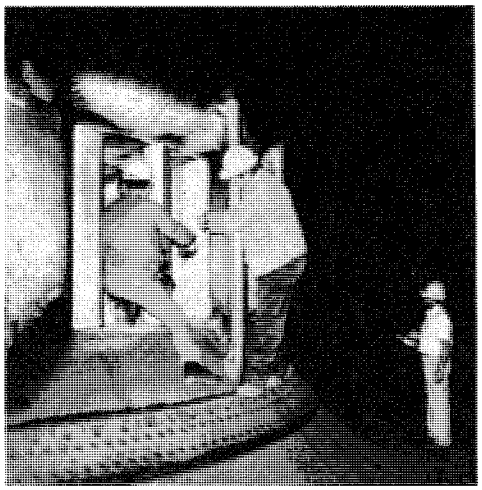


Pipeline at Havasu Pumping Plant.

The initial plan of operation for water year 1982 was based on an objective minimum release of 8.23 million acre-feet from Lake Powell. With this release, and assuming average inflow conditions, the projected active storage at Lake Powell would have been less than the active storage at Lake Mead by September 30, 1982.

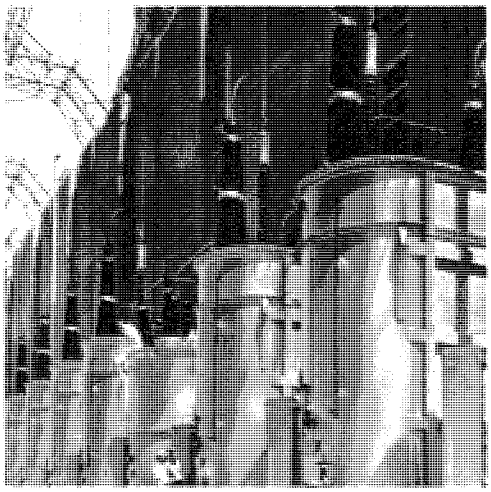
Beginning in April, however, the forecasted most probable inflow to Lake Powell was above average, and the scheduled release from Lake Powell was increased to 8.6 million acre-feet in order to equalize storage with Lake Mead by the end of the water year. This plan of operation remained in effect until mid-June when the inflow forecast was revised downward. The revised forecasted inflow would have placed the projected active storage of Lake Powell below Lake Mead even with a minimum objective release of 8.23 million acre-feet.

Projected Plan of Operation Under Criteria-Water Year 1983



Davis Dam turbine runner inspection.

Headgate Rock Dam.



Transformers.

The consequences of readjusting the plan of operation late in the water year were considered; after discussion and consultation with interested agencies and groups, scheduled summer releases were reduced in order to meet a minimum objective from Lake Powell of 8.23 million acre-feet. The actual inflow into Lake Powell during the summer months was considerably greater than the forecasted inflow. As a result, by September 30, 1982, the active storage of Lake Powell was 23,005,000 acre-feet and the active storage at Lake Mead was 22,766,000 acre-feet. Total release from Lake Powell during water year 1982 was 8.30 million acre-feet.

During water year 1982, the water supply in the Colorado River Basin was approximately 111 percent of the long-term average, ranging from 132 percent for the Green River above Flaming Gorge Dam to 100 percent for the Gunnison River above Blue Mesa Dam. The major storage reservoirs in the Colorado River Basin stayed within the normal operating range during water year 1982. Aggregate Colorado River system storage at the end of the water year was 54,029,000 acre-feet, representing an increase of 4,456,000 acre-feet from the previous year. By the end of the water year, active storage in the system was approximately 96 percent of the January 1 maximum available storage.

Determination of "602[a] Storage"

Section 602(a)(3) of the Colorado River Basin Project Act of September 30, 1968 (Public Law 90-537), provides for the storage of Colorado River water not required to be released under article III (c) and III (d) of the Colorado River Compact in Upper Basin reservoirs, to the extent the Secretary of the Interior (Secretary) finds it necessary to assure compact deliveries without impairment of annual consumptive uses in the Upper Basin.

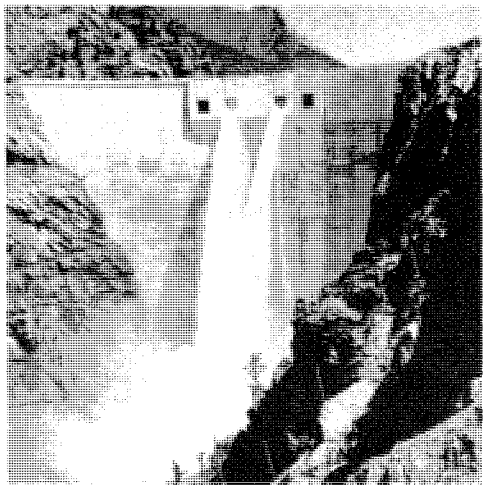
Article II of the "Criteria for Coordinated Long-Range Operation of Colorado River Reservoirs" (Operating Criteria) provides that the annual plan of operation shall include a determination by the Secretary of the quantity of water considered necessary to be in Upper Basin storage as of September 30 of the current year.

This determination shall consider all applicable laws and relevant factors including, but not limited to the following: (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 Public Law 90-537.

Taking into consideration these relevant factors, the Secretary has determined that the active storage in Upper Basin reservoirs forecast for September 30, 1983, exceeds the "602(a) Storage" requirement under any reasonable range of assumptions which might be applied to those items previously listed. Therefore, the accumulation of "602(a) Storage" is not the criterion governing the release of water during the current year.

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 (Commission), before the beginning of each calendar year.



Spectacular Morrow Point Dam.

Canal excavation - 1935.

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. During water year 1982, Mexico received a total delivery of about 1,412,000 acre-feet at the Northerly International Boundary.

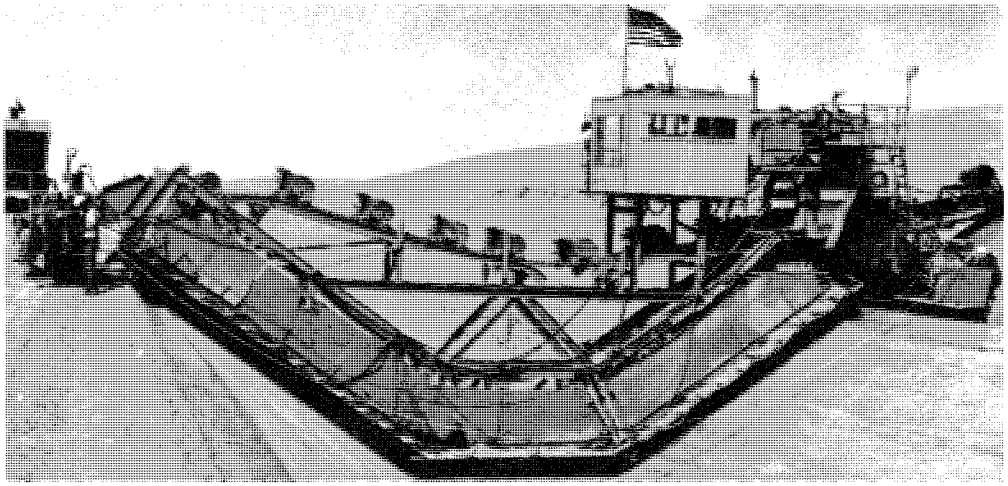
Of the 1,412,000 acre-feet of mainstream Colorado River water reaching the Boundary, about 1,600 acre-feet was delivered through Pilot Knob Powerplant wasteway from the All-American Canal. An estimated 352,000 acre-feet was released through Laguna Dam. The remainder of the flow at the Northerly International Boundary was made up of return flows to the Colorado River below Laguna Dam, and returns to the Gila River below the gaging station near Dome.

Because of the current water supply conditions, the United States will make scheduled deliveries of 1,700,000 acre-feet of Colorado River water to the Republic of Mexico in calendar year 1983. This release of water is based upon average runoff conditions for the year. Should the runoff in water year 1983 be substantially above average, significant releases for flood control purposes could be required from Hoover Dam. Representatives of the Republic of Mexico will be kept informed of operating schedules through the United States Section of the Commission.

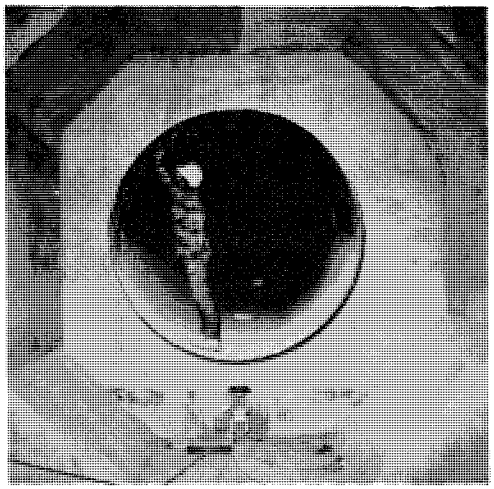
Regulatory Wastes

Deliveries to Mexico consist of river water delivered to Imperial Dam and waste and drainage return flows from water users below Imperial Dam. In addition to assuring normal water deliveries, the small amount of regulatory storage space in Imperial, Laguna, and Senator Wash Reservoirs was used at times to limit potential downstream flood damages during water year 1982. Regulatory waste for water year 1983 will depend on the actual hydrologic conditions occurring during that time.

Projected Plan of Operation- Water Year 1983



Canal excavation - 1983.



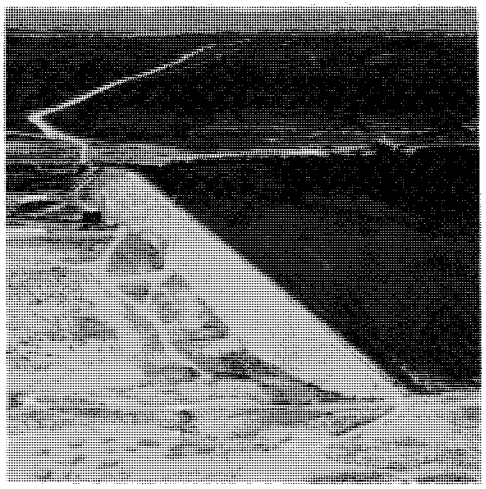
Inspection of Hassayampa discharge line.

A proposed operation plan for water year 1983 for the Colorado River reservoir system was formulated and distributed to representatives of the Colorado River Basin States during October and November 1982. The plan was prepared in accordance with the Operating Criteria published June 4, 1970, in compliance with Section 602, Public Law 90-537. The plan reflects operation for flood control, domestic and irrigation use of water, hydroelectric power generation, water quality control, fish and wildlife propagation, recreation, and Colorado River Compact requirements.

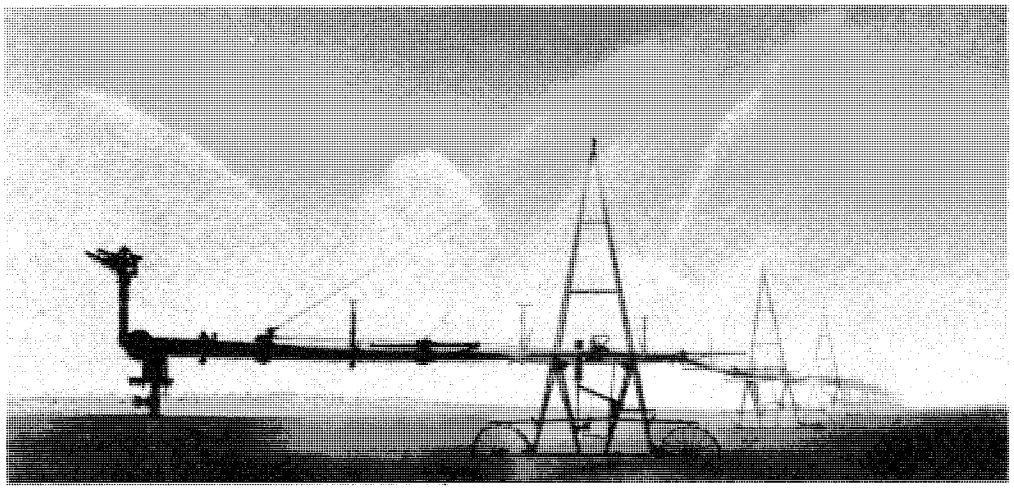
The plan calls for a minimum objective release from Lake Powell of 8.23 million acre-feet under lower quartile inflow conditions, or less. Under most probable to upper quartile inflow conditions, the scheduled releases from Lake Powell are projected to range from 9.6 to 12.0 million acre-feet in order to equalize storage with Lake Mead by the end of September 1983.

The projected operation for average runoff conditions for each reservoir in the Colorado River Basin for water year 1983 is described in the following pages. Charts 1-8 show the projected monthly outflows from each reservoir for four assumed hydrologic conditions. Each condition reflected the most current hydrologic information available by including actual forecasted October and November 1982 inflows. Inflows for the remainder of the year were based on the following assumptions of 1983 modified runoff from the Basin: (1) average based on the 1906-1981 record of runoff; (2) upper quartile based on the annual level of streamflow which has been exceeded 25 percent of the time during 1906-1981; (3) lower quartile based on flows exceeded 75 percent of the time during 1906-1981; and (4) most adverse based on the lowest year of record, which was 1977.

Upper Basin Reservoirs
Fontenelle Reservoir
[Green River]



Fontenelle Dam and Reservoir.



Self propelled sprinkler system, Yuma Mesa.

Water Year 1982
Fontenelle Reservoir is operated for power generation, water supply, flood control, fish and wildlife enhancement, and recreation. The water surface was gradually lowered from an elevation of 6493 feet at the beginning of the water year to a low of 6480 feet in April 1982. The reservoir filled at the end of June and remained essentially full through the remainder of the water year.

The minimum release during the fall and winter was 400 cubic feet per second (cfs). The maximum release for the water year was 13,280 cfs. The maximum inflow of 13,060 cfs occurred on July 1. The minimum release for power generation is 500 cfs; the maximum release through the powerplant is 1,750 cfs at rated head. A total of 1,629,000 acre-feet was released from the reservoir with 796,000 acre-feet bypassing the powerplant.

Water Year 1983
At the beginning of water year 1983, the elevation at Fontenelle Reservoir was 6504 feet with a content of 326,000 acre-feet. Releases from the reservoir, assuming average runoff conditions, will be scheduled to draw the water down to 6479 feet prior to the spring runoff.

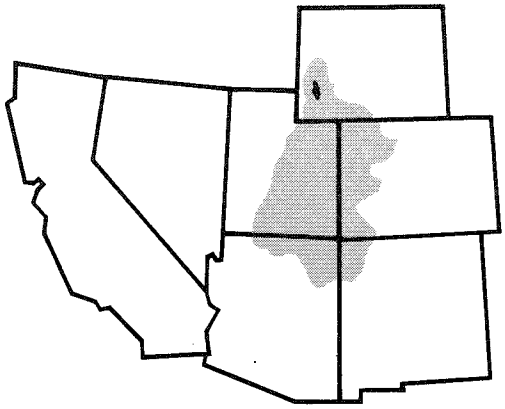
During October, the reservoir was drawn down 13 feet in order to investigate the cause of increased seepage along the left abutment. A drilling and test program is being conducted to determine whether remedial action should be taken.

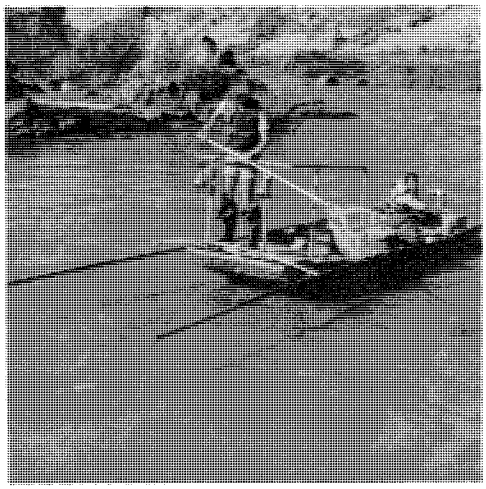
The maximum release from Fontenelle Reservoir is dependent primarily on the magnitude of the inflow. If the inflow is in the upper quartile, peak outflow is expected to be less than 10,000 cfs. With an average inflow, the anticipated peak outflow is less than 5,000 cfs. Assuming a lower quartile inflow, the outflow will probably be no greater than 3,000 cfs.

Fontenelle Active Storage* **Chart 1**

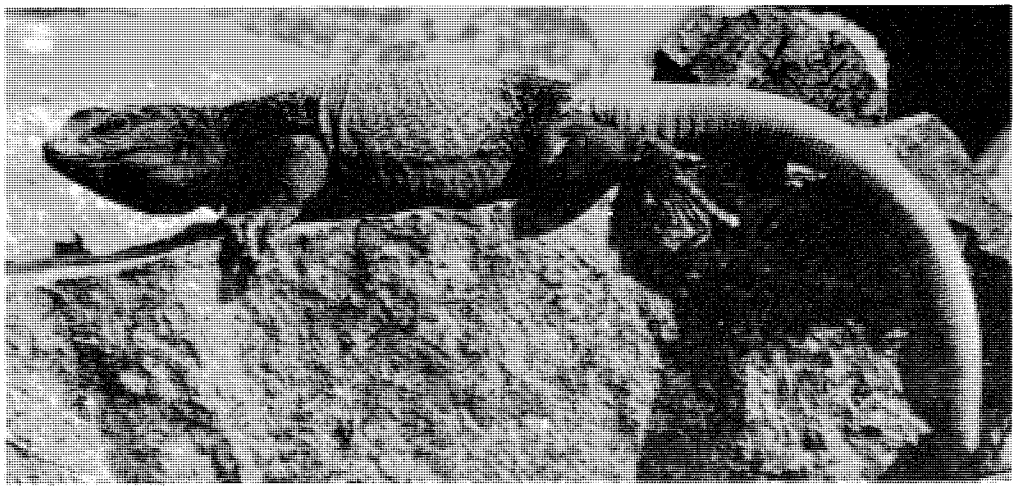
Reservoir	(Acre-Feet)	El.(Ft.)
Maximum Storage	344,834	6506
Rated Head	233,789	6491
Minimum Power	194,962	6485
Surface Area (Full)	8058 Acres	
Reservoir Length (Full)	18 Miles	
Power Plant		
Number of Units	1	
Total Capacity	10,000 Kilowatts	

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





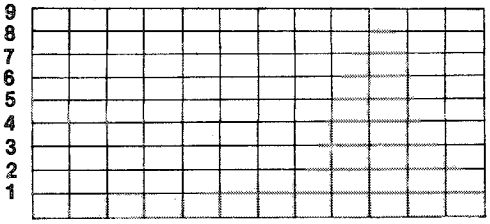
Sampling of fish populations.



Harmless Chukwalla.

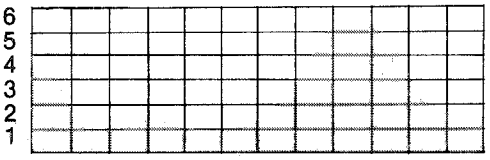
Outflow Release in 1000 Cubic Feet/Second

Actual Operation 1982

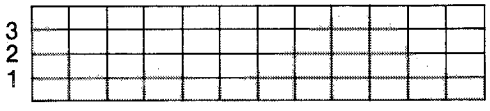


Projected Operation 1983

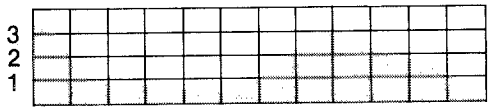
Upper Quartile



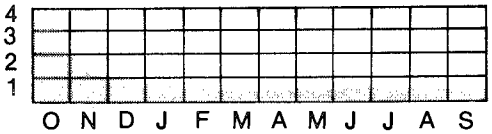
Average



Lower Quartile



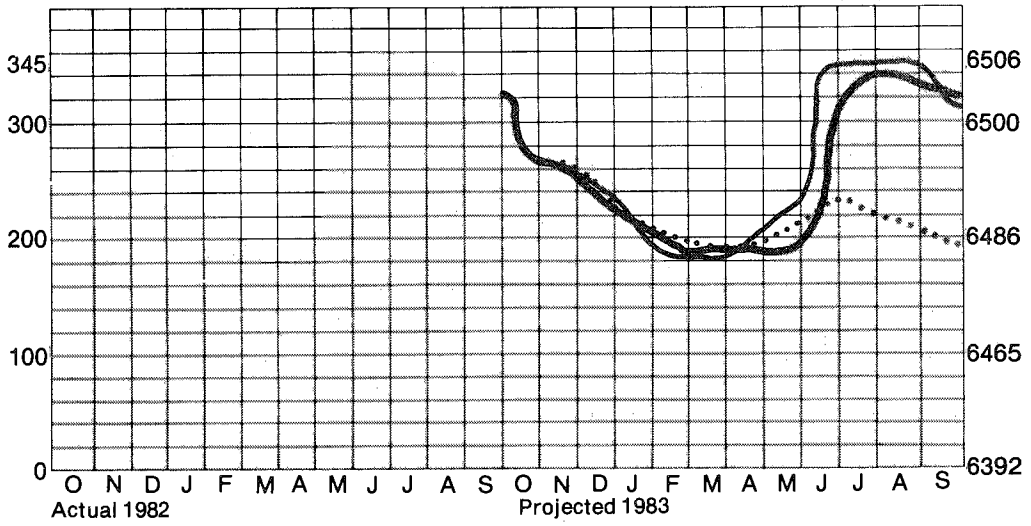
Most Adverse



Storage

Usable Content in 1000 Acre-Feet

Elevation (Feet) Non-linear Scale



Legend

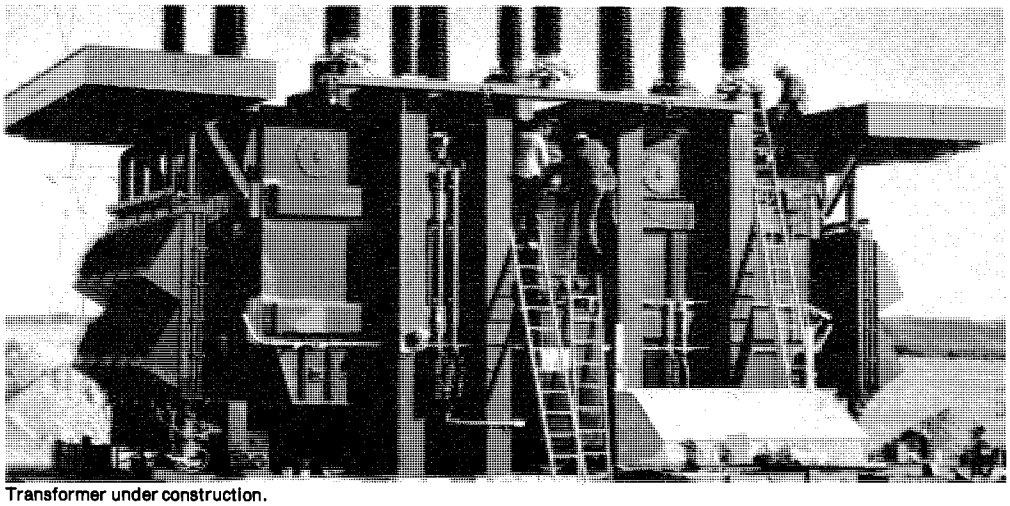
Most Probable

Upper Quartile

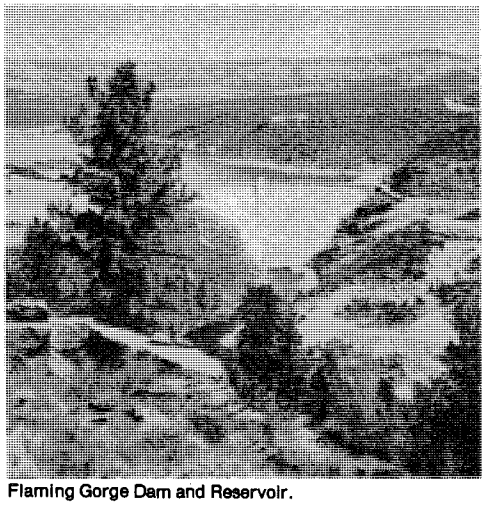
Lower Quartile

Most Adverse

Flaming Gorge Reservoir
[Green River]



Transformer under construction.



Flaming Gorge Dam and Reservoir.

Water Year 1982

At the beginning of water year 1982, the reservoir water surface elevation was 6018 feet with a content of 2,913,700 acre-feet. Prior to the spring runoff, the reservoir elevation was drawn down to 6010 feet. The April through July 1982 runoff above Flaming Gorge was 1,458,000 acre-feet, 126 percent of the long-term average. With this runoff, the reservoir reached its seasonal maximum elevation of 6036 feet with a content of 3,590,600 acre-feet by mid-August. This approximate elevation was maintained through the end of the water year, and by September 30, 1982, the elevation was 6036 feet with a content of 3,572,300 acre-feet.

The normal minimum release at Flaming Gorge Reservoir is 800 cfs. The maximum release through the powerplant is 4,600 cfs at rated head. During the water year, a total of 1,257,000 acre-feet was released through the powerplant.

Water Year 1983

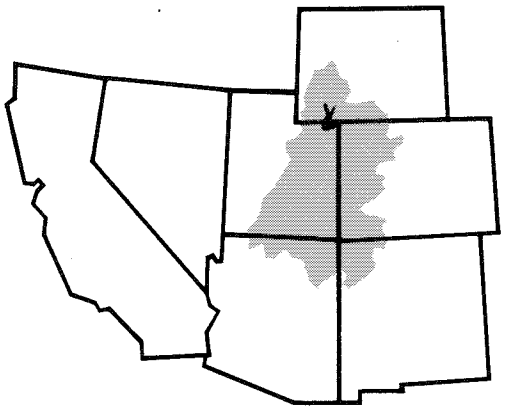
During water year 1983, the reservoir level at Flaming Gorge is projected to be drawn from 6036 feet to about 6024 feet before the spring of 1983. The water level will remain high enough under any inflow conditions to launch boats from the reservoir's nine ramps. Average inflow would result in a maximum elevation of 6035 feet with a storage of 3,546,000 acre-feet during July.

Due to high carryover storage and scheduled work on the spillway, releases from Flaming Gorge will be higher than average in water year 1983. Flow in the river below the dam, however, is not expected to exceed 4,000 cfs or to fall below 800 cfs.

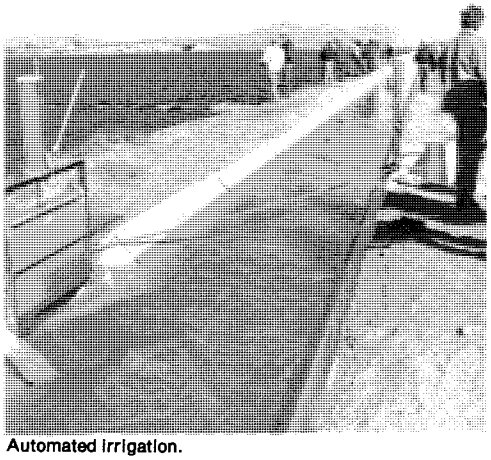
Flaming Gorge Active Storage* **Chart 2**

Reservoir	(Acre-Feet)	El. (Ft.)
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



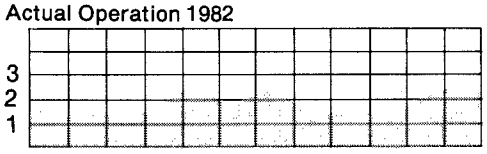
Away from it all.



Automated irrigation.

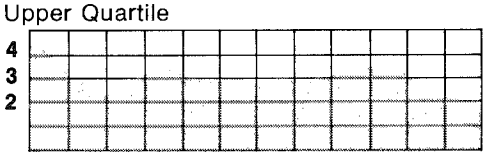
Outflow Release in 1000 Cubic Feet/Second

Actual Operation 1982

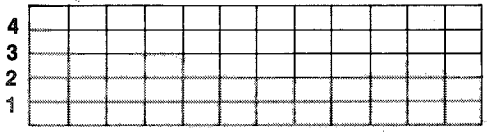


Projected Operation 1983

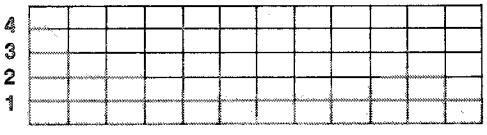
Upper Quartile



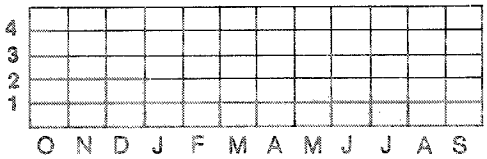
Average



Lower Quartile



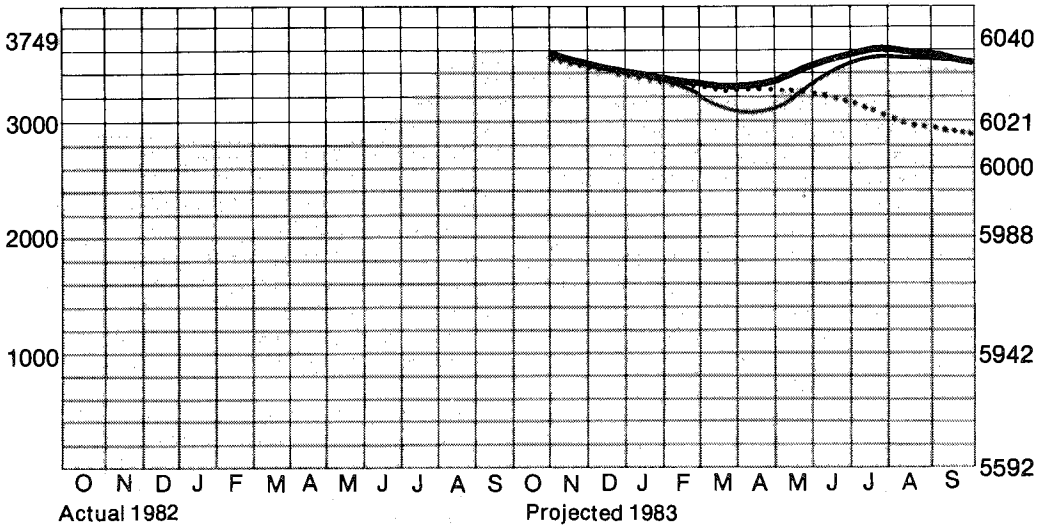
Most Adverse



Storage

Usable Content in 1000 Acre-Feet

Elevation in Feet (Non-Linear Scale)



Legend

Most Probable

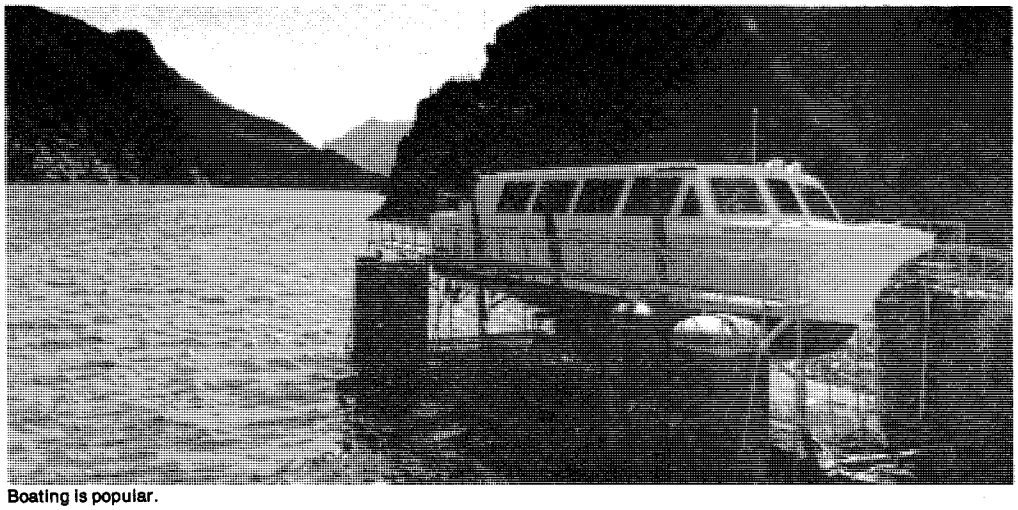
Upper Quartile

Lower Quartile

Most Adverse

Wayne N. Aspinall Unit [Gunnison River]
Blue Mesa Reservoir
Morrow Point Reservoir
Crystal Reservoir

Blue Mesa Dam on the Gunnison.



Boating is popular.

Water Year 1982

The Wayne N. Aspinall Unit, formerly the Curecanti Unit, includes Blue Mesa, Morrow Point, and Crystal Reservoir. Blue Mesa provides nearly all of the long-term regulation for all three powerplants. Morrow Point provides peaking power, and thus has highly variable releases. The primary function of Crystal Reservoir is to reregulate the variable Morrow Point releases.

At the end of September 1981, Blue Mesa Reservoir contained 376,100 acre-feet of active storage with a water surface elevation of 7461 feet. The April through July 1982 runoff above Blue Mesa was 742,000 acre-feet, 96 percent of the long-term average. The total water year runoff of 1,070,000 acre-feet was approximately equal to the long-term average. The water surface elevation of Blue Mesa reached a maximum of 7509 feet in June 1982, with a content of 739,100 acre-feet. No water bypassed the powerplant during water year 1982.

The drawdown for power operations and river regulation was great enough that no further space evacuation for flood control was required. During water year 1982, all flows in the Gunnison River below the Gunnison Tunnel were greater than 200 cfs, the minimum discharge required to protect the fishery in the river.

Water Year 1983

Assuming average inflow for water year 1983, Blue Mesa Reservoir is expected to reach a low of 7463 feet with an active storage of approximately 392,000 acre-feet in March. The reservoir is projected to fill to its maximum storage of 829,000 acre-feet at elevation 7519 feet.

Morrow Point Reservoir will operate at or near its capacity during the current year. Crystal Reservoir will also operate nearly full except for daily fluctuations needed in regulating the releases for Morrow Point and to meet downstream requirements for fish habitat and diversions through the Gunnison Tunnel.

Assuming average runoff conditions, releases from Crystal Reservoir will be maintained at powerplant capacity of about 1,600 cfs. Under lower quartile runoff conditions, releases will range from the minimum of 1,000 cfs to a maximum of 1,700 cfs. If the inflow is above average, it will be necessary to bypass the powerplant.

Blue Mesa Active Storage* — **Chart 3**

Reservoir	(Acre-Feet)	El.(Ft.)
Maximum Storage	829,523	7519
Rated Head	249,395	7438
Minimum Power	81,070	7393
Surface Area (Full)	9,180 Acres	
Reservoir Length (Full)	24 Miles	
Power Plant		
Number of Units	2	
Total Capacity	60,000 Kilowatts	

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

Morrow Point Active Storage*

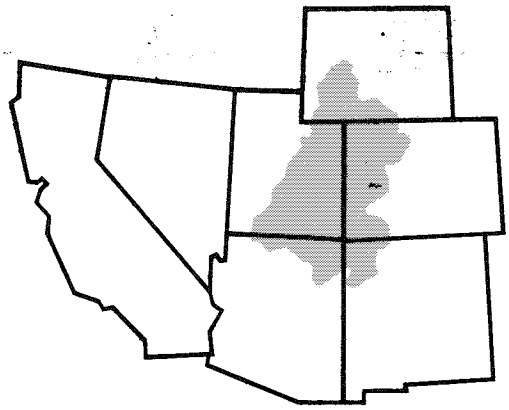
Maximum Storage	117,025	7160
Rated Head	79,805	7108
Minimum Power	74,905	7100
Surface Area (Full)	817 Acres	
Reservoir Length (Full)	11 Miles	
Power Plant		
Number of Units	2	
Total Capacity	120,000 Kilowatts	

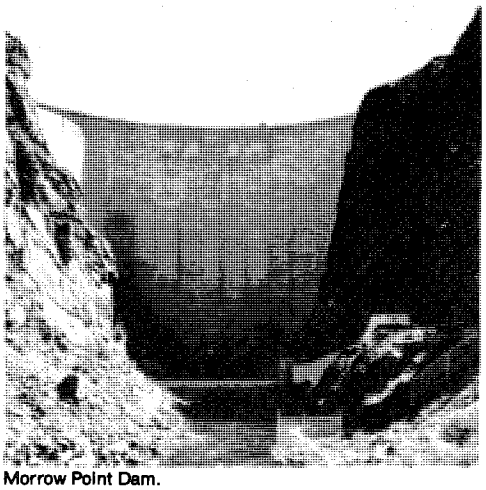
*does not include 165 acre-feet of dead storage below 6808 feet

Crystal Active Storage*

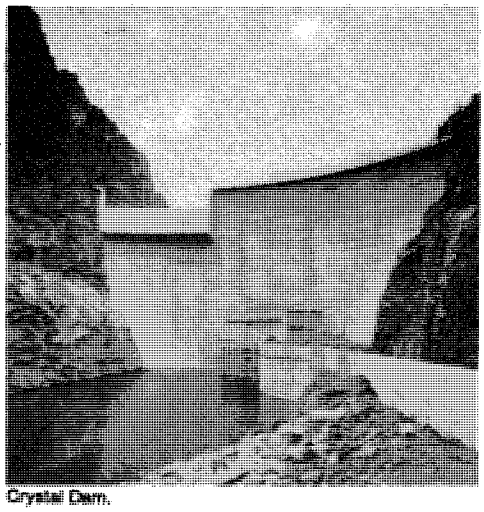
Maximum Storage	17,573	6755
Rated Head	13,886	6742
Minimum Power	10,619	6729
Surface Area (Full)	301 Acres	
Reservoir Length (Full)	7 Miles	
Power Plant		
Number of Units	1	
Total Capacity	28,000 Kilowatts	

*does not include 8,200 acre-feet of dead storage below 6670 feet

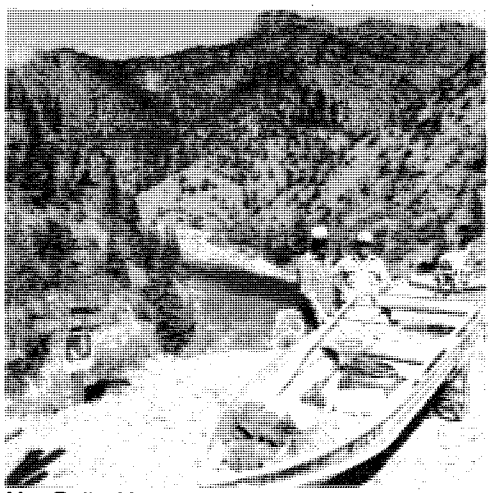




Morrow Point Dam.



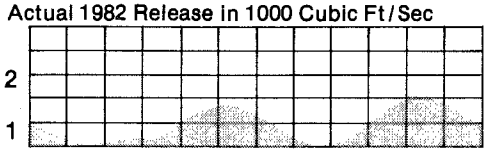
Crystal Dam.



Mesa Trail at Morrow Point.

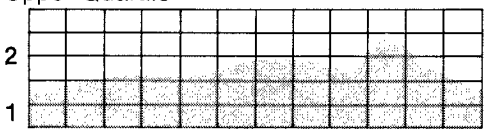
Outflow Blue Mesa Reservoir

Actual 1982 Release in 1000 Cubic Ft/Sec

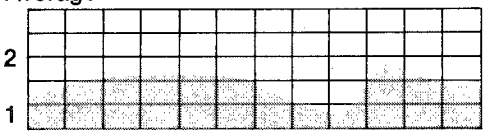


Projected Operation 1983

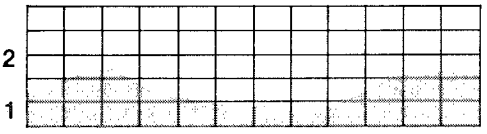
Upper Quartile



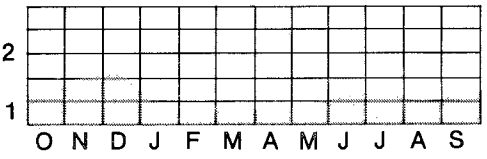
Average



Lower Quartile



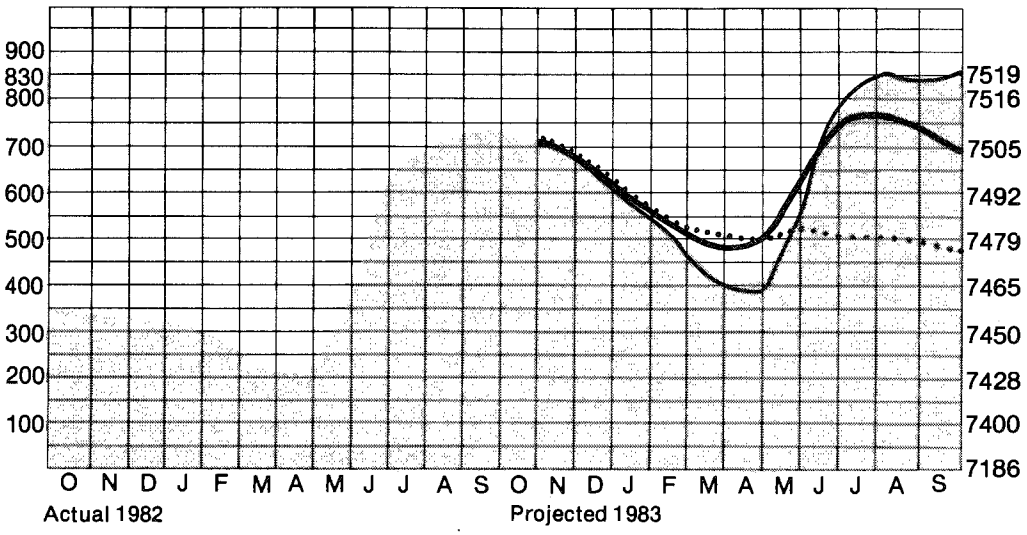
Most Adverse



Storage Blue Mesa Reservoir

Usable Content in 1000 Acre-Feet

Elevation in Feet (Non-Linear Scale)



Actual 1982 Projected 1983

Legend

Most Probable

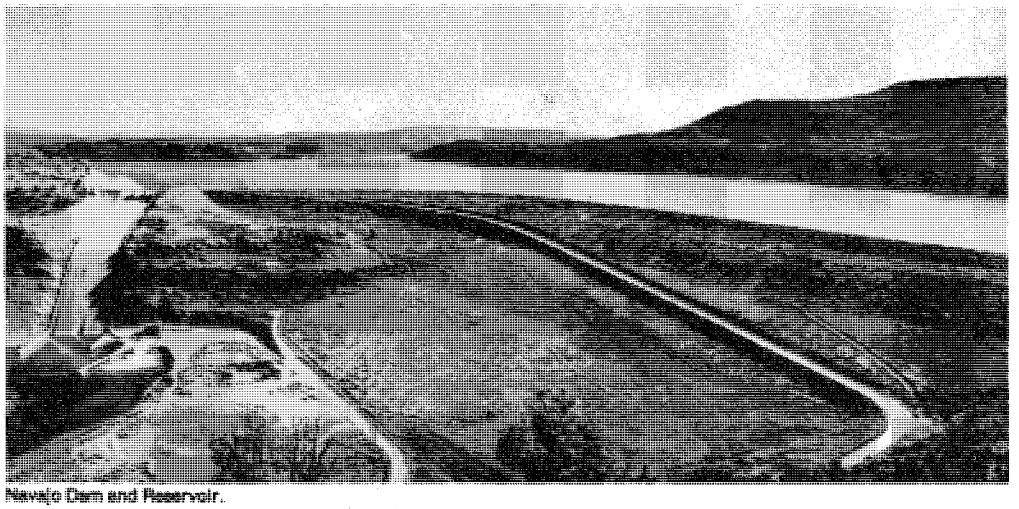
Upper Quartile

Lower Quartile

Most Adverse

Navajo Reservoir
[San Juan River]

"Dragon's teeth" slow spillway water.



Navajo Dam and Reservoir.

Water Year 1982
At the beginning of the water year, the reservoir elevation was 6052 feet with a content of 1,246,000 acre-feet. It was gradually drawn down to 6048 feet prior to the spring runoff. The water surface reached its highest elevation of 6072 feet by the end of September 1982 with a content of 1,506,000 acre-feet.

During the first part of water year 1982, 530 cfs was released for consumptive use and maintenance of fish and wildlife. The April-July 1982 inflow was 685,000 acre-feet, which is 97 percent of the long-term average. Total inflow for the water year was 1,159,000 acre-feet, 115 percent of normal. During the water year, a maximum inflow of 6,650 cfs occurred on May 4.

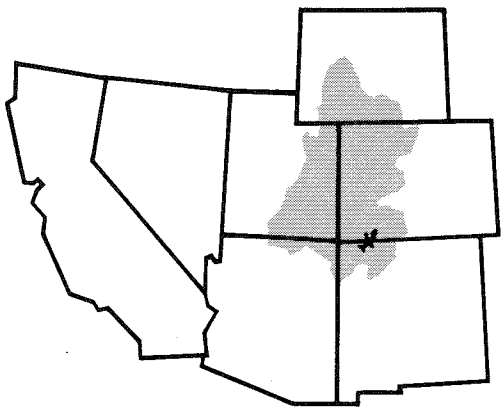
Water Year 1983
On September 30, 1982, Navajo Reservoir stored 1,506,000 acre-feet of water at an elevation of 6072 feet. Assuming average inflow for water year 1983, the projected elevation before snowmelt runoff begins is 6059 feet with a content of 1,329,000. By the end of June 1983, the reservoir is expected to reach an elevation of 6081 feet with a content of 1,641,000 acre-feet. This approximate elevation will be maintained throughout the summer to enhance recreational use.

Releases from Navajo Reservoir for an upper quartile inflow are projected to average 1,200 cfs through the fall and winter and increase to a maximum of 2,000 cfs during the summer. For an average inflow, releases are expected to average about 1,250 cfs throughout the year. The projected lower quartile and most adverse releases are projected to average about 900 cfs and 700 cfs, respectively, throughout the water year.

Navajo Active Storage* **Chart 4**

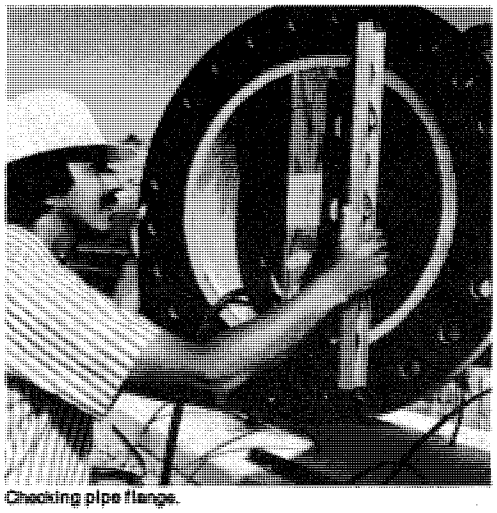
Reservoir	(Acre-Feet)	El. (Ft.)
Maximum Storage	1,696,400	6085
Inactive Storage	660,500	5990
Surface Area (Full)	15,610 Acres	
Reservoir Length (Full)	33 Miles	

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



Pipeline emplacement equipment.

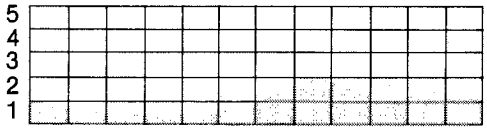
Environmental studies, Lake Havasu.



Checking pipe flange.

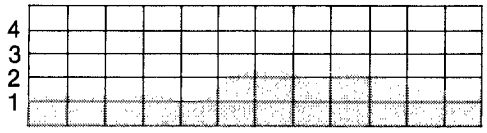
Outflow Release in 1000 Cubic Feet/Second

Actual Operation 1982

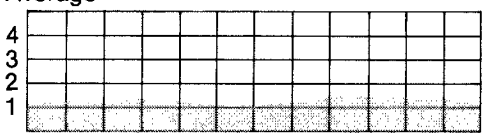


Projected Operation 1983

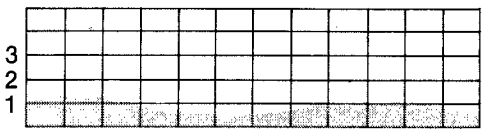
Upper Quartile



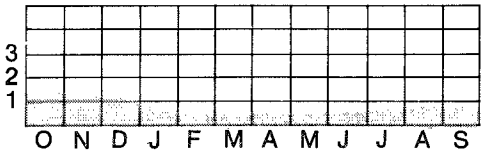
Average



Lower Quartile



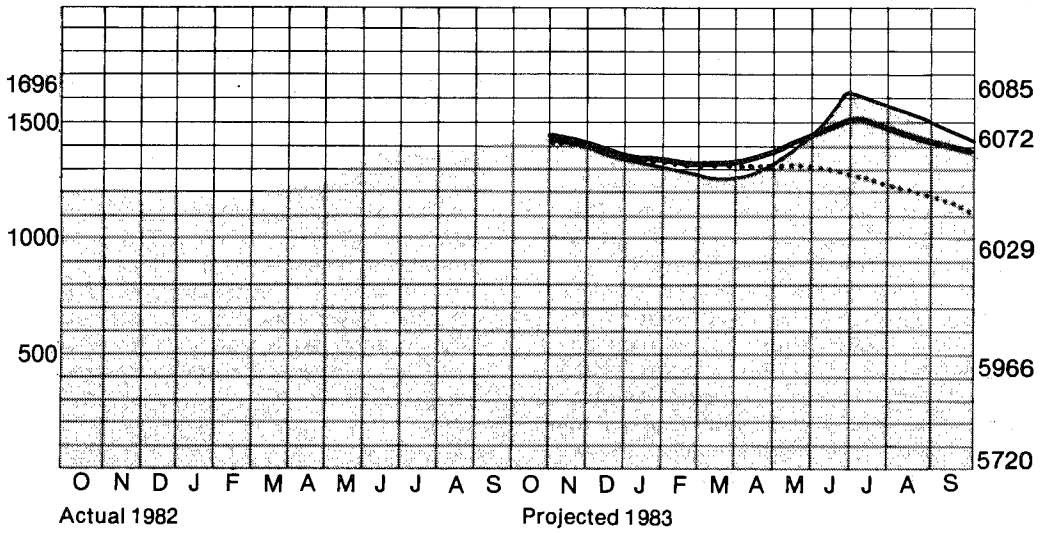
Most Adverse



Storage

Usable Content in 1000 Acre-Feet

Elevation in Feet (Non-Linear Scale)



Actual 1982 Projected 1983

Legend

Most Probable

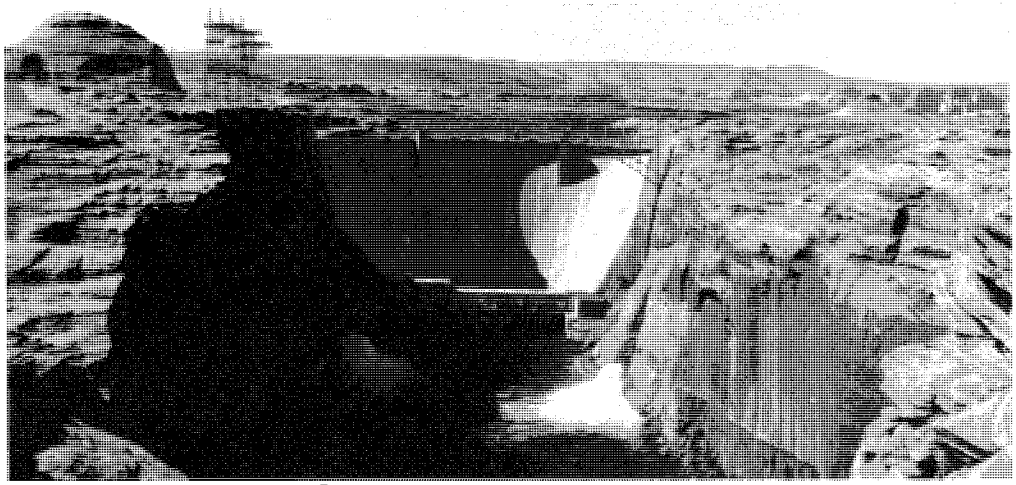
Upper Quartile

Lower Quartile

Most Adverse

Lake Powell [Colorado River]

Boating on Lake Powell.



Spillways in operation at Glen Canyon Dam.

Water Year 1982
During water year 1982, Lake Powell, which is impounded by Glen Canyon Dam, was operated as part of the Colorado River Storage Project (CRSP) in accordance with governing contracts and laws to provide river regulation, optimum power production, recreation, and fish and wildlife enhancement.

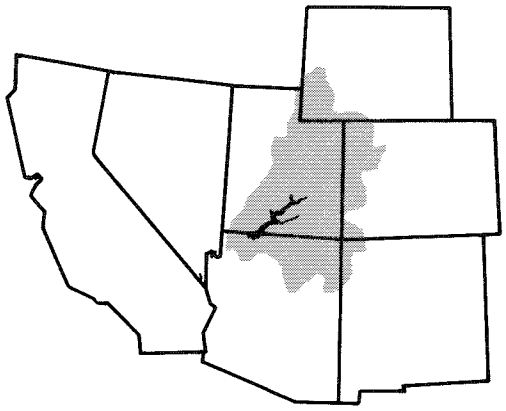
On September 30, 1981, the Lake Powell water surface elevation was 3672 feet with an active storage of 20,751,000 acre-feet. The April-July 1982 runoff above Lake Powell was 8,392,000 acre-feet, approximately 110 percent of the long-term average. The water surface elevation was drawn down to a minimum of 3662 feet by mid-February, and a maximum level of 3687 feet was reached by August 1982. This approximate level was maintained throughout the remainder of the water year. Total releases from Lake Powell amounted to 8,295,000 acre-feet.

Water Year 1983
By the end of September 1982, the elevation of Lake powell was 3687 feet with a content of 23,005,000 acre-feet. Under average runoff conditions, the reservoir is expected to be drawn down to about 3681 feet by the spring of 1983, and reach a maximum elevation of 3699 feet by the end of July. At this elevation, the content is 24.9 million acre-feet, 100 percent of active capacity, and the surface area is approximately 160,650 acres. Under most probable through upper quartile inflow conditions, releases from Lake Powell are projected to range from 9.6 to 12.0 million acre-feet in order to equalize storage with Lake Mead by the end of September 1983. Under lower quartile conditions, or less, the scheduled releases are 8.23 million acre-feet.

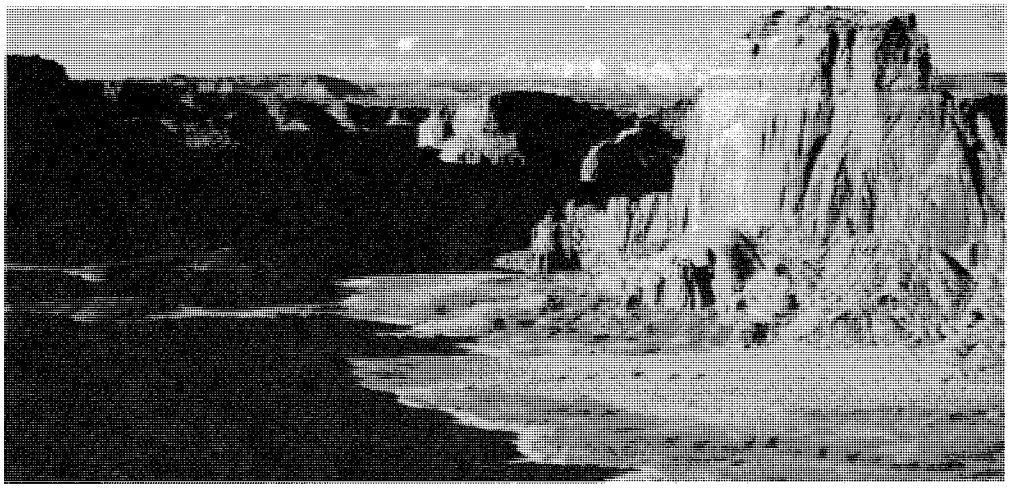
Lake Powell Active Storage* **Chart 5**

Reservoir	(Acre-Feet)	El. (Ft.)
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	1,021,000 Kilowatts	

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



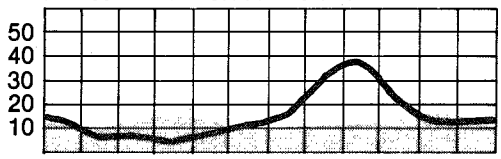
The fishing is good.



Lake Powell.

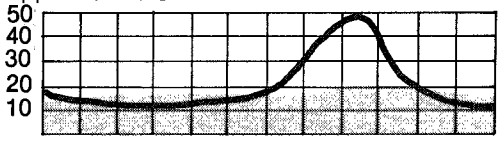
Inflow **Outflow**

Actual 1982 in 1000 Cubic Feet/Second

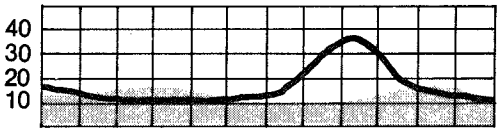


Projected 1983

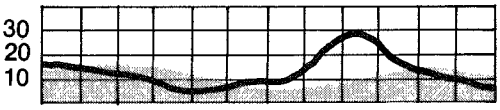
Upper Quartile



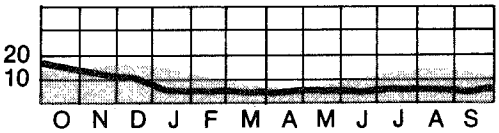
Average



Lower Quartile



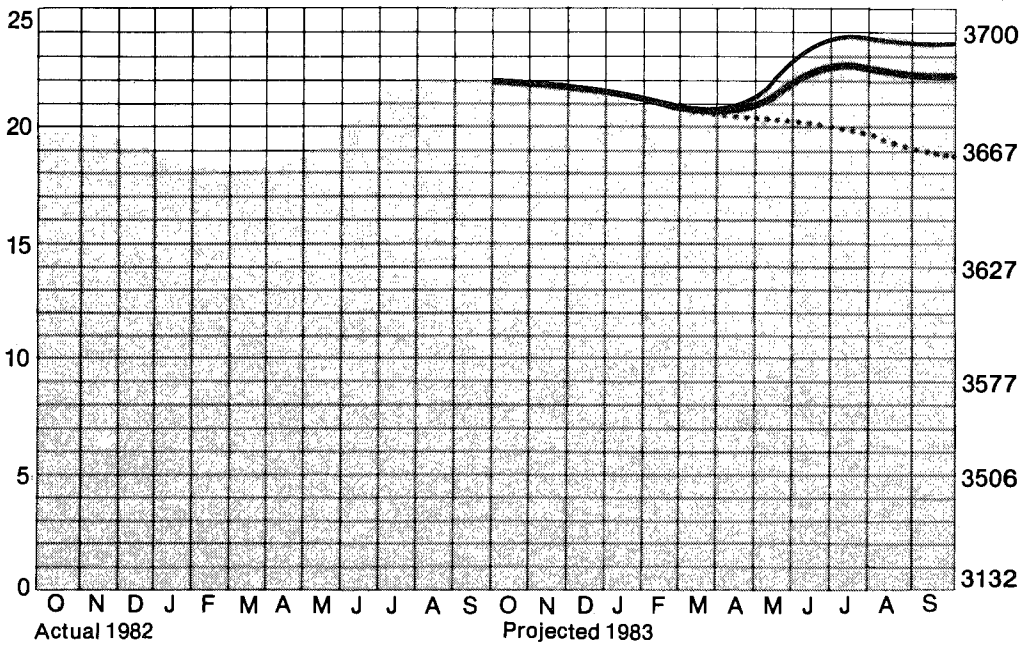
Most Adverse



Storage

Usable content in Million Acre-Feet

Elevation in Feet (Non-Linear Scale)



Legend

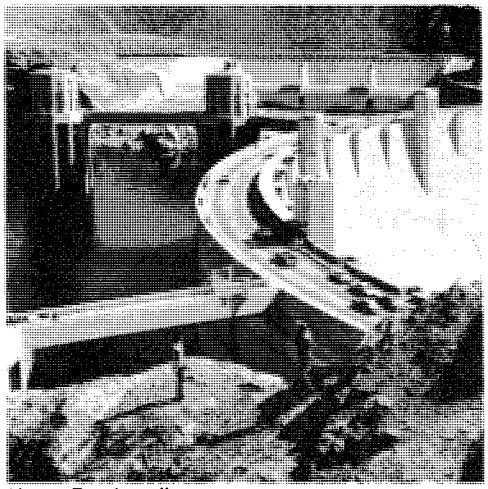
Most Probable

Upper Quartile

Lower Quartile

Most Adverse

Lower Basin Reservoirs
Lake Mead [Colorado River]



Hoover Dam in earlier years.

Irrigation duties.

Water Year 1982
At the beginning of water year 1982, Lake Mead, impounded by Hoover Dam, had a water surface elevation of 1193 feet and an active storage of 21,870,000 acre-feet. During the water year, releases were made to meet downstream water use requirements in the United States and Mexico, programmed 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.

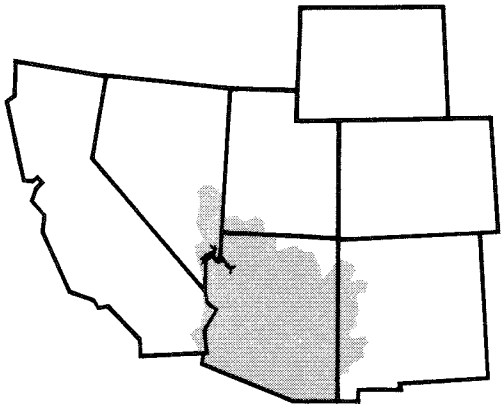
The total release from Lake Mead through Hoover Dam during water year 1982 was an estimated 7,377,000 acre-feet. At the end of the water year, Lake Mead had a water surface elevation of 1199 feet and an active storage of 22,770,000 acre-feet which reflect an increase in storage during the water year of 900,000 acre-feet. On September 30, 1982, the active storage of Lake Mead was 240,000 acre-feet less than the active storage in Lake Powell.

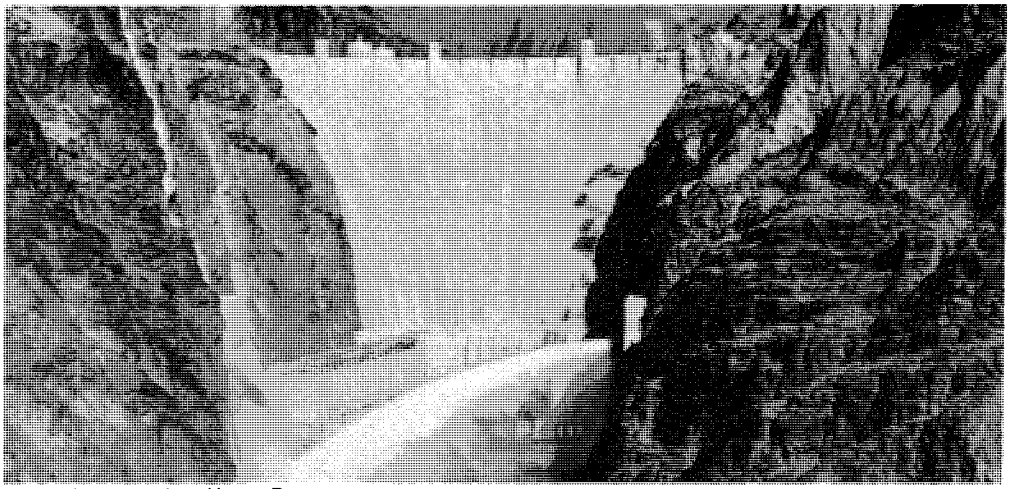
Water Year 1983
During the 1983 water year, the Lake Mead water level is scheduled to rise to 1213 feet at the end of February 1983, then be drawn down to a low elevation of 1207 feet at the end of June 1983. At that level, the lake will have an average active storage of about 23.9 million acre-feet. During water year 1983, a total of about 7.5 million acre-feet is scheduled to be released from Lake Mead.

Lake Mead Active Storage* **Chart 6**

Reservoir	(Acre-Feet)	El. (Ft.)
Maximum Storage	27,377,000	1229
Rated Head	13,653,000	1123
Minimum Power	10,024,000	1083
Surface Area (Full)	162,700 Acres	
Reservoir Length (Full)	115 Miles	
Power Plant		
Number of Units	17	
Total Capacity	1,344,800 Kilowatts	

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



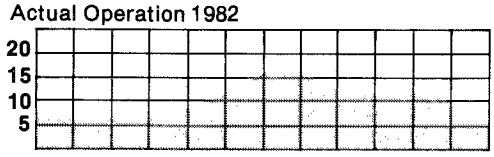


Unwatering penstocks at Hoover Dam.

Palo Verde Diversion Dam.

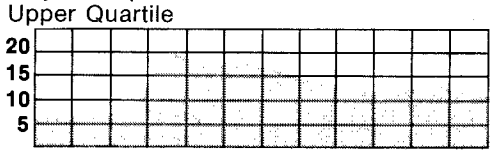
Outflow Release in 1000 Cubic Feet/Second

Actual Operation 1982

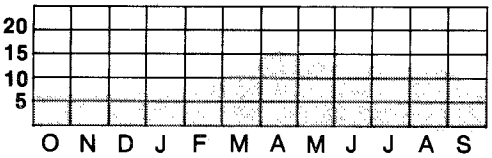


Projected Operation 1983

Upper Quartile



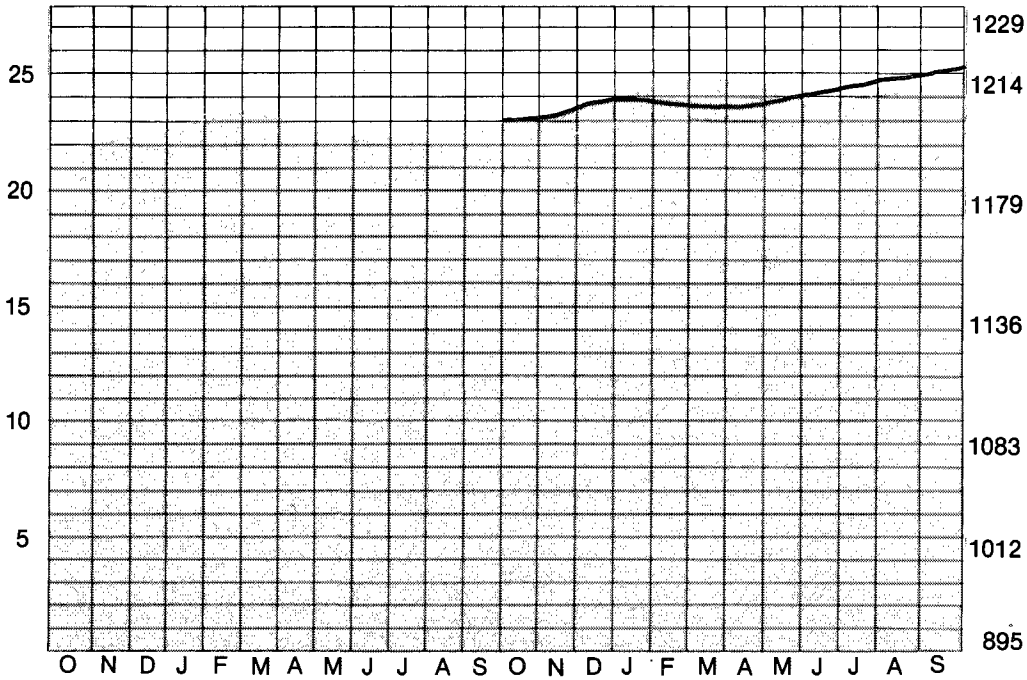
Average, Lower Quartile, Most Adverse



Storage

Active Content in Million Acre-Feet

Elevation in Feet (Non-Linear Scale)



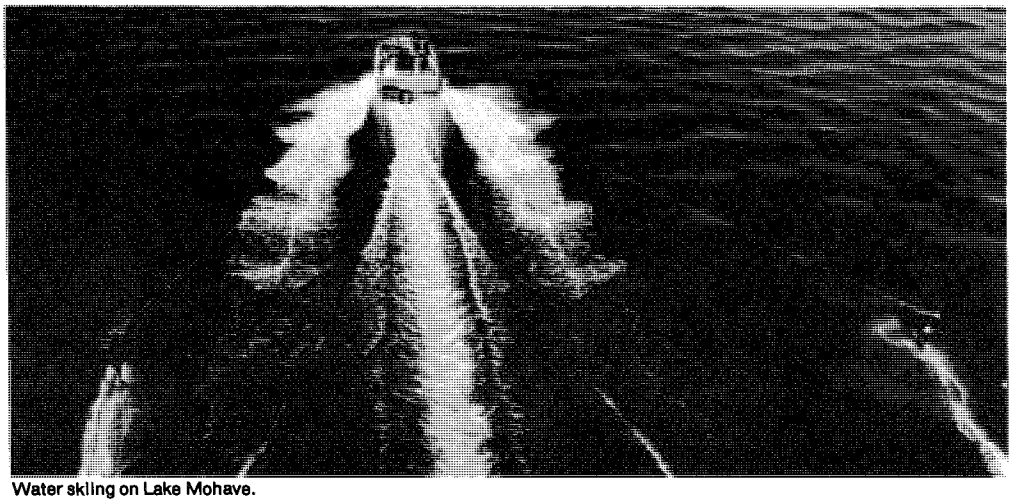
Actual 1982 Projected 1983

Legend

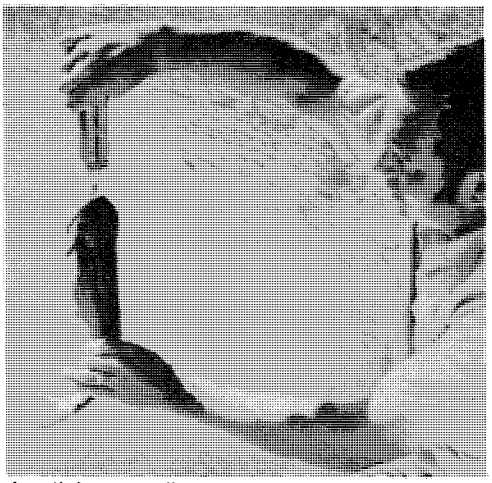
Most Probable

Upper Quartile

Lake Mohave [Colorado River]



Water skiing on Lake Mohave.



Aquatic impact studies.

Water Year 1982

At the beginning of water year 1982, the water surface elevation of Lake Mohave, which is impounded by Davis Dam, was 635 feet, with an active storage of 1,475,000 acre-feet.

During the winter and spring months, the water level was gradually raised to 647 feet, with an active storage of 1,806,000 acre-feet near the end of May 1982. The water level was drawn down during the summer and the reservoir ended the water year at elevation 633 feet with 1,426,000 acre-feet in active storage.

Lake Mohave releases were made to satisfy downstream requirements, with a small amount of reregulation at Lake Havasu. During the water year, approximately 7,515,000 acre-feet were released at Davis Dam, all of which passed through the turbines for power production.

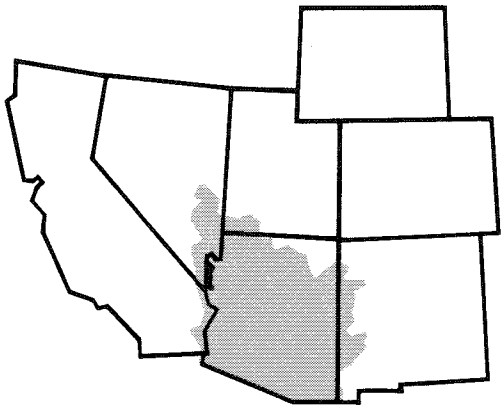
Water Year 1983

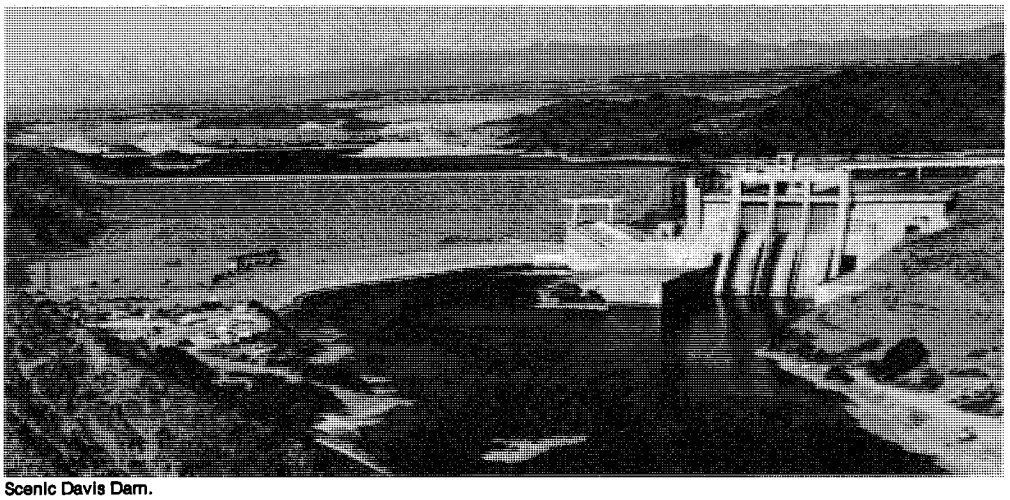
The water level of Lake Mohave is scheduled to rise through the fall and winter months and reach an elevation of 644 feet by the end of May 1983. Because of heavy irrigation use during the summer months, the water level in Lake Mohave is expected to be drawn down to an elevation of 630.5 feet by the end of water year 1983. During that time a total of 7.8 million acre-feet is scheduled to be released from Lake Mohave to meet all downstream requirements.

Lake Mohave Active Storage* **Chart 7**

Reservoir	(Acre-Feet)	El. (Ft.)
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)	67 Miles	
Power Plant		
Number of Units	5	
Total Capacity	240,000 Kilowatts	

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





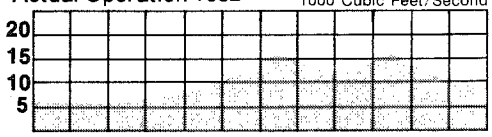
Scenic Davis Dam.

Infrared thermometer determines water needs.

Lake Mohave Outflow

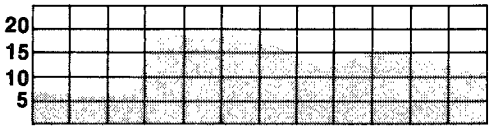
Actual Operation 1982

Release in 1000 Cubic Feet/Second

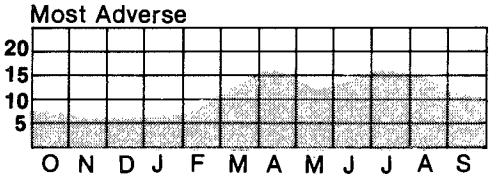


Projected Operation 1983

Upper Quartile



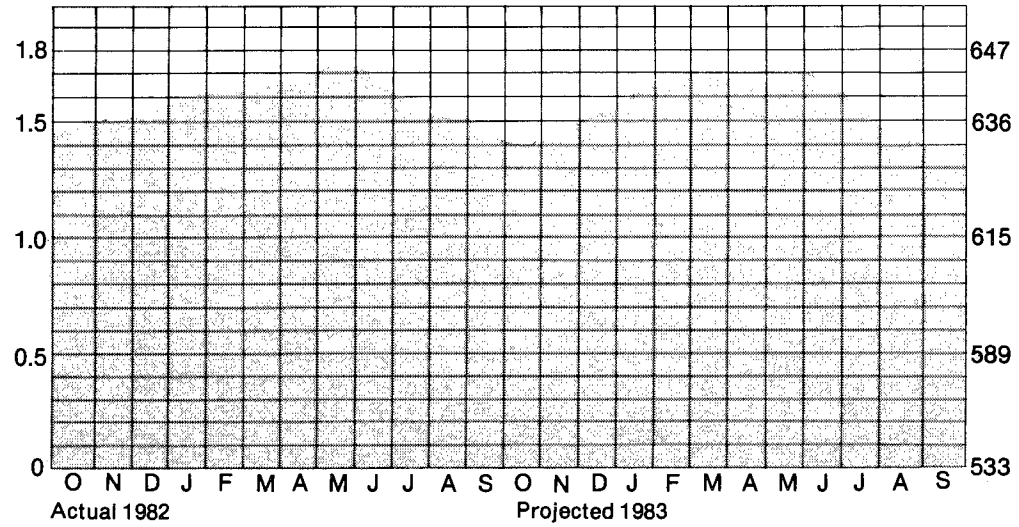
Average, Lower Quartile, Most Adverse



Lake Mohave Storage

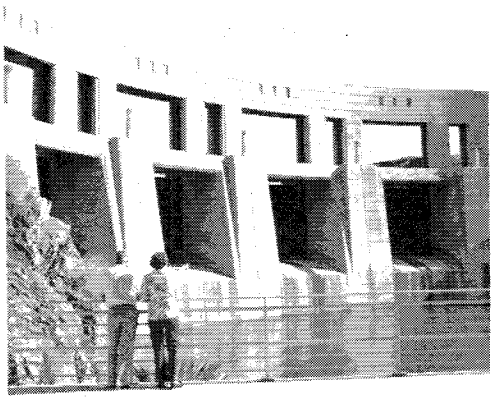
Usable Content in Million Acre-Feet

Elevation in Feet (Non-Linear Scale)



Lake Havasu [Colorado River]

Urbanization contrasts with desert and agricultural land.



Parker Dam.

Water Year 1982
At the beginning of water year 1982, the water level of Lake Havasu, impounded by Parker Dam, was at elevation 447 feet with an active storage of approximately 569,000 acre-feet. The reservoir was drawn down to approximately elevation 445 feet, with an active storage of about 530,000 acre-feet in March to provide vacant space for runoff from the drainage area between Davis and Parker Dams. The water level was then raised to an approximate elevation of 450 feet by the end of May, with an active storage of about 622,000 acre-feet. By the end of the water year, Lake Havasu was drawn down to about 447 feet with an active storage of 560,000 acre-feet.

During the water year, approximately 6,371,000 acre-feet were released at Parker Dam, all of which passed through the turbines for power production. That amount included flood control releases from Alamo Dam on the Bill Williams River.

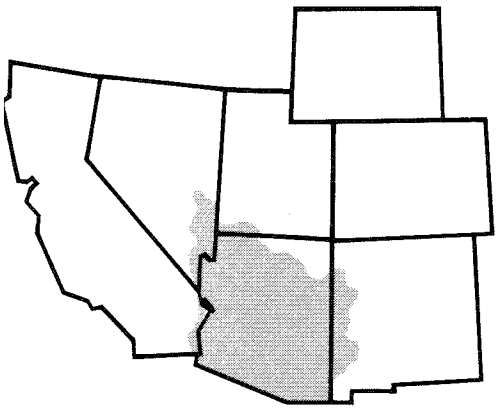
Space in the top 10 feet of Lake Havasu (about 180,000 acre-feet) is reserved by the United States for control of floods and other uses, including river regulation. Normally, only about the top 4 feet, or 77,000 acre-feet of space, have been used for this purpose since Alamo Reservoir on the Bill Williams River has been in operation.

Water Year 1983
Lake Havasu is scheduled at the highest levels consistent with the requirements for maintaining reservoir regulation space. The yearly low elevation of approximately 446 feet is scheduled for the November through February high flood hazard period. The yearly high of about 450 feet is scheduled for the low flood hazard months of May and June. During water year 1983, a total of approximately 6.8 million acre-feet is scheduled to be released from Lake Havasu to meet all downstream requirements.

Lake Havasu Active Storage* **Chart 8**

Reservoir	(Acre-Feet)	El.(Ft.
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	120,000 Kilowatts	

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

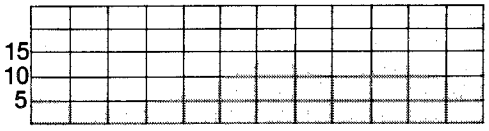


Lettuce harvest near Yuma.

Innertube race.

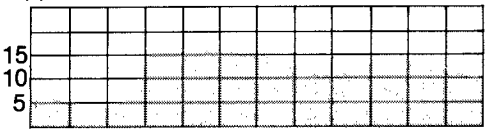
Outflow Release in 1000 Cubic Feet/Second

Actual Operation 1982

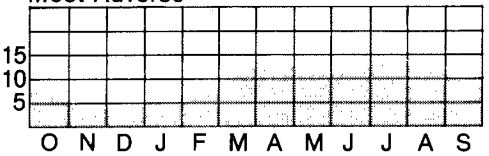


Projected Operation 1983

Upper Quartile



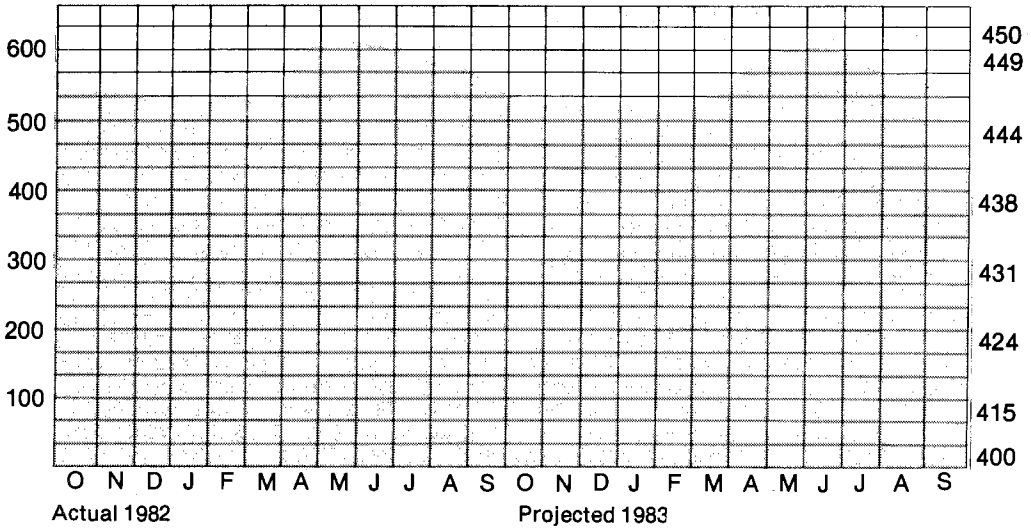
Average, Lower Quartile, Most Adverse



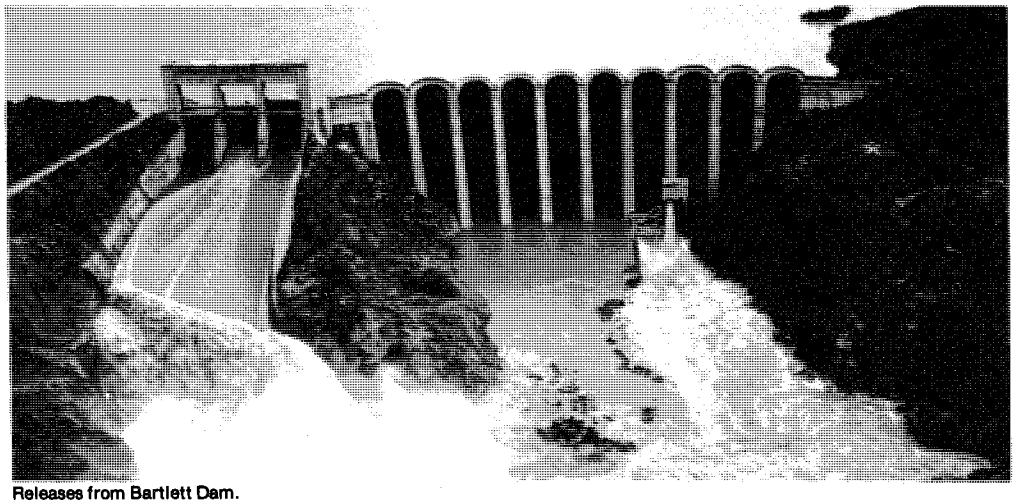
Storage

Usable Content in 1000 Acre-Feet

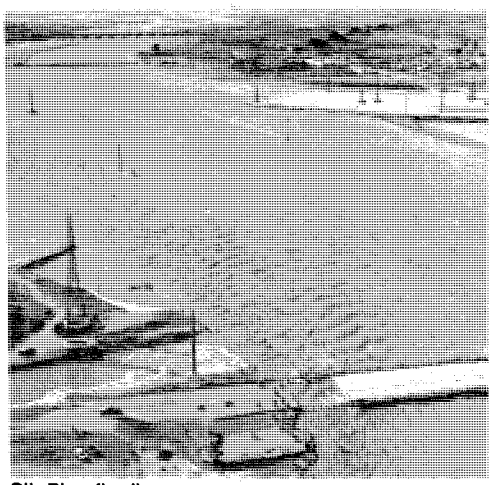
Elevation in Feet (Non-Linear Scale)



River Regulation



Releases from Bartlett Dam.



Gila River flooding.

The natural virgin runoff reaching the streams of the Colorado River drainage system above Glen Canyon Dam during water year 1982 was estimated at about 16.3 million acre-feet. Of this amount, about 3.9 million acre-feet were consumptively used within the Upper Colorado River Basin States.

Adjustments in storage in mainstem reservoirs resulted in an inflow to Lake Powell of 11.1 million acre-feet. The release from Glen Canyon Dam, based on measurements at the gaging station at Lees Ferry, Arizona, was 8,295,000 acre-feet. For the 1-year and 10-year periods ending September 30, 1982, 8,312,000 acre-feet and 89,679,000 acre-feet, respectively, passed the Compact point at Lee Ferry.

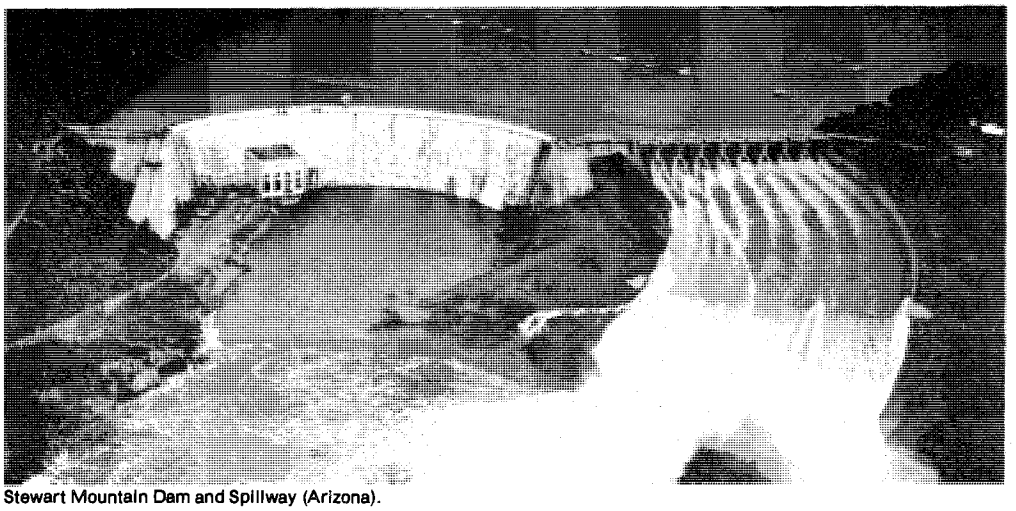
The projected release from Lake Powell, based on lower quartile runoff conditions or less, is 8,230,000 acre-feet. The projected release for an upper quartile runoff condition is 12,000,000 acre-feet. When added to the flow of the Paria River, this would result in an Upper Basin delivery ranging from 86.8 to 90.5 million acre-feet for the 10-year period ending September 30, 1983.

Daily releases are made from the storage reservoirs in the Lower Basin to meet the incoming orders of the water agencies. Normally, all water passes through the powerplant units. 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 flow objectives are provided in the river to maintain fishery habitat.

Adjustments to the normal releases are made when conditions permit to provide more satisfactory conditions for water-oriented recreation activities, to provide transport for riverborne sediment to desilting facilities, and to assist in controlling water quality. Releases from Lake Powell were at least 1,000 cfs during the winter months and were increased to at least 3,000 cfs during the summer months. Minimum daytime releases during the summer months averaged 8,000 cfs.

River regulation below Hoover Dam resulted in a total delivery to Mexico of approximately 330,000 acre-feet in excess of the treaty quantity (1,500,000 acre-feet) during water year 1982. Of that amount, 145,000 acre-feet of drainage waters were bypassed for salinity control pursuant to provisions of Minute No. 242 of the Commission.

Flood Control



Stewart Mountain Dam and Spillway (Arizona).

Aqueduct paving.

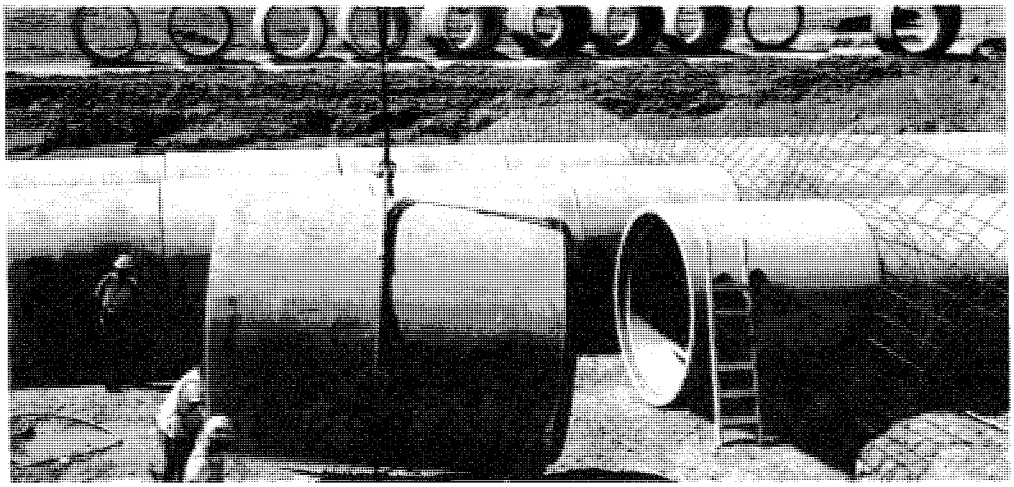
Lake Mead is the only reservoir on the Colorado River in which a specific space is exclusively allocated for mainstem flood control. Flood control regulations for Hoover Dam are being updated and revised based on findings of a joint study by the Bureau of Reclamation (Reclamation) and the Army Corps of Engineers (Corps) with consultation and advice of State and local interests.

A final report which summarizes the study findings and recommends a new flood control operation plan for Hoover Dam is scheduled for release in 1983. Subsequent to approval of the report, the new flood control regulations for Hoover Dam will be formally promulgated. Flood control storage space will be maintained in Lake Mead as stipulated in the Field Working Agreement between Reclamation and the Corps for flood control operation of Hoover Dam and Lake Mead. These stipulated regulations establish releases in a manner that maximizes public benefits in the United States with reasonable consideration for conditions in Mexico.

Local flood control protection was provided by the reservoirs within the basin during water year 1982, which received greater total precipitation than during normal years. Total Colorado River reservoir system storage at the start of water year 1982 was approximately 49.6 million acre-feet and about 54.0 million acre-feet at the end of the water year, representing a 4.4 million acre-feet decrease in total remaining available reservoir space.

In addition to the mainstem structures, Alamo Dam on the Bill Williams River, and Painted Rock Dam on the Gila River (both in the Lower Basin) received flood inflow during winter months. Painted Rock and Alamo Reservoirs are scheduled to be operated at minimum flood control levels during 1983.

Beneficial Consumptive Uses



Concrete cross-drainage pipe.

Water quality analysis.

Upper Basin Uses and Losses

The three largest sources of consumptive use in the Upper Colorado Basin are agricultural use within the drainage basin, diversion to adjacent drainage systems, and evaporation losses. During water year 1982, the estimated use for agricultural and municipal and industrial supply in the Upper Basin was 2,460,000 acre-feet. Estimated evaporation losses were 681,000 acre-feet from mainstem reservoirs. Approximately 783,000 acre-feet were diverted for use in adjacent drainage basins. Thus, total estimated consumptive use amounted to 3,924,000 acre-feet. Storage in the Upper Basin mainstem reservoirs increased by approximately 3.6 million acre-feet during water year 1982.

Lower Basin Uses and Losses

During water year 1982, an estimated 6,371,000 acre-feet of water were released from Lake Havasu to meet the requirements for water deliveries at Imperial Dam, as well as those of the Colorado River Indian Reservation near Parker, Arizona, the Palo Verde Irrigation District near Blythe, California, other miscellaneous users along the river, and transit losses between Parker Dam and Imperial Dam.

The major water diversion above Parker Dam was by The Metropolitan Water District (MWD) of Southern California. MWD pumped approximately 770,000 acre-feet from Lake Havasu during water year 1982. None of this water was utilized for delivery to the city of Tijuana, although the contract for temporary emergency delivery of a portion of Mexico's treaty entitlement is still in existence. During water year 1982, releases of approximately 7,515,000 acre-feet were made from Lake Mohave to provide for releases at Parker Dam; to supply diversion requirements of 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 1982, releases of approximately 7,377,000 acre-feet were made from Lake Mead at Hoover Dam to regulate the levels of Lake Mohave and to provide for the small users and the losses from this reservoir. In addition, 138,000 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, in Nevada. During water year 1982, the total releases and diversions from Lake Mead were an estimated 7,515,000 acre-feet.

For water year 1983, a release of 7.5 million 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 1983, MWD is expected to divert 733,000 acre-feet by pumping from Lake Havasu. Consumptive uses by small users, river losses or gains, and reservoir losses between Davis Dam and Parker Dam are projected to be a net loss of 219,000 acre-feet.

There are no major users between Hoover Dam and Davis Dam. During water year 1983, consumptive uses by small users, river losses or gains, and reservoir losses between Hoover Dam and Davis Dam are projected to be a net gain of 202,000 acre-feet. The net diversions from Lake Mead are projected at 143,000 acre-feet. Evaporation from Lake Mead is expected to be about 993,000 acre-feet and net gain between Glen Canyon Dam and Lake Mead is expected to be about 881,000 acre-feet.

Water Quality Operations

Holiday at Lake Havasu City.

Cutting silage.

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.11 of the biennial series was issued in December 1982.

During water year 1982, the United States bypassed a total of 145,000 acre-feet through the Bypass Drain. This water was replaced with a like amount of other water, pursuant to Minute No. 242 of the International Boundary and Water Commission.

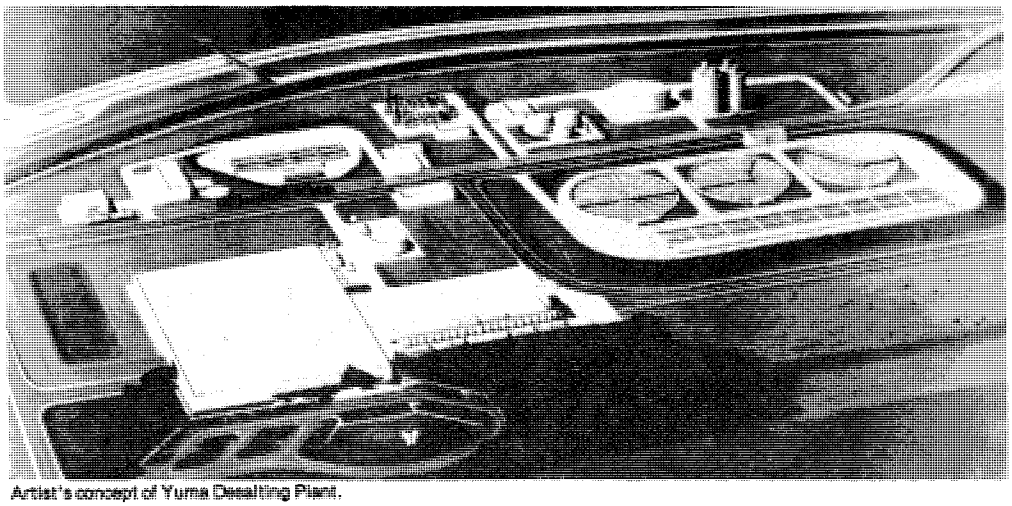
Under the provisions of Minute No. 242, the Republic of Mexico is entitled to receive at Morelos Dam water of a quality no worse than 115 parts per million (p/m) ($\pm$ 30 p/m) greater than that arriving at Imperial Dam. During water year 1982, the average salinity of the Colorado River at Imperial Dam was 823 p/m. During that period the average salinity of the waters at Morelos Dam was 938 p/m, resulting in a salinity differential of 115 p/m, within the provision of Minute No. 242.

No large amount of Gila River infiltration to the Wellton-Mohawk Irrigation and Drainage District is expected during water year 1983 because no flood control releases from Painted Rock Reservoir are anticipated to reach the Colorado River. The total flows in the Bypass Drain during water year 1983 are estimated to be about 150,000 acre-feet. No bypass waters are expected to be returned to the Colorado River below Morelos Dam during water year 1983.

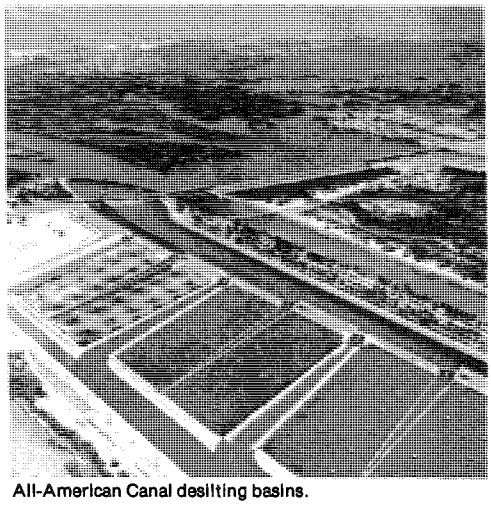
In recognizing the need to manage water quality of the Colorado River, it has been recommended that long-term salinity increases in the river be controlled through a water quality improvement program generally described in the report, Colorado River Water Quality Improvement Program, dated February 1972, and a status report of the same title, dated January 1974.

The program calls for a basin-wide approach to salinity control while the Upper Basin continues to develop its compact-apportioned waters. The initial step towards improvement of the quality of the river's water was authorization by the Congress of the Colorado River Basin Salinity Control Project (Public Law 93-320), on June 24, 1974.

Environmental Programs



Artist's concept of Yuma Desalting Plant.



All-American Canal desilting basins.

Upper Basin

Although excellent trout tailwater fisheries were created through the construction and operation of the Upper Basin dams and reservoirs, the cold, clear water also changed habitat for several rare native fish in the Green, Colorado, and San Juan Rivers. In order to evaluate the impacts of reservoir operation on the native fish, a Colorado River Fishery Project was initiated. Over the last 3 years, many State and Federal wildlife resource agencies, along with Reclamation, participated in the joint study effort.

In April 1982, a three-volume final report was cooperatively prepared and released by Reclamation and the Fish and Wildlife Service (FWS). Findings of the study included the abundance and distribution of endangered Colorado squawfish, humpback chub, and bonytail chub in the Upper Basin. Monitoring of fish movements, reproduction, and population stability was also conducted. Recommendations on appropriate flows to help preserve the fish in their natural habitat were also made.

Additional monitoring will continue on the rare fish to insure continued compatibility between the exotic and native fish in the Upper Colorado River system and future development and use of the water resources of the Upper Basin States.

In water year 1983, Reclamation, in cooperation with the National Park Service (NPS) and other non-Federal agencies, will initiate studies in the Grand Canyon. The purpose of these studies is to better quantify the impacts of the current operation of Glen Canyon Powerplant. They will concentrate on sedimentation and the biology of the Colorado River and its shoreline in the Grand Canyon; analyze the effects of the current operation of Glen Canyon Powerplant; and address various alternatives to the present operations.

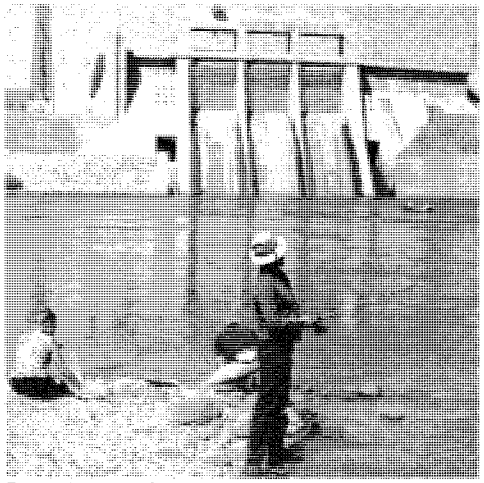
Lower Basin

Hoover Dam is internationally recognized for its engineering and architectural design as well as its far reaching social and economic impacts. Therefore, it is listed on the National Register of Historic Places. Regulations of the Advisory Council on Historic Preservation (Council) require that Federal agencies consult with both the appropriate State Historic Preservation Officer (SHPO) and the Council itself when a National Register property may be affected by an agency action.

Because of this, under normal circumstances the Arizona and Nevada SHPO's would be consulted for even routine maintenance and operation of Hoover Dam. In order to eliminate the repetitive and time consuming process of consulting with the SHPO's, a Programatic Memorandum of Agreement for maintenance and operation of the Dam is being negotiated with the Arizona and Nevada SHPO's and the Council. As provided for in Council regulations, the agreement will allow for a one time consultation to cover ongoing operation and maintenance at the Dam. The agreement will make it possible for Reclamation to fulfill both the "spirit and the letter of the law" in preserving the significant historic qualities of Hoover Dam.

The Central Arizona Project (CAP) will be one of the largest and most complex projects that Reclamation has ever constructed. The cultural resources, both historical and archeological, affected by the project are correspondingly rich and complex. The nearly 400 miles of aqueduct that will transport Colorado River water to users in central Arizona, and the associated storage and regulatory features, will affect hundreds of archeological and historical sites. Reclamation already has an extensive survey and mitigation program in progress to fulfill its responsibilities for the preservation and management of these cultural resources.

In order to unify the cultural resource program for the entire CAP, Reclamation's Preservation Officer is preparing a Cultural Resource overview. The overview will summarize the results of the work already accomplished. Because the location for many



Recreation below Davis Dam.

Humpback Chub.

of the CAP facilities corresponds closely with the territory of the HoHoKam culture, the results of CAP-related archeological research is adding much to the knowledge of these ancient farming people. The HoHoKam area centered in the drainages of the Lower Gila, and the Salt and Verde Rivers in the Phoenix-Tucson region. The overview will not only summarize much of our present knowledge of the area, but will also develop an overall research strategy for the project. This will insure a better integrated approach to fulfilling Reclamation's responsibilities, will help eliminate duplication of effort between project features, and will produce a more effective program in terms of research and preservation.

The overview is also making it possible to develop a Programatic Memorandum of Agreement with the Council and the Arizona and New Mexico Historic Preservation Officers. The agreement will satisfy cultural resource consultation requirements with the Council for the entire CAP.

Under a Memorandum of Agreement with the FWS, desert wildlife populations along CAP canal alinements are being studied. These studies, concentrating on the impacts of canals on desert ungulates, are being conducted by the University of Arizona's Cooperative Wildlife Research Unit.

Information gathered on deer use of a canal with a record of mortalities and success of various escape devices will be useful in planning mitigation for the CAP and other canal systems.

The Lower Colorado Region is also cooperating in a multiagency effort to study the nesting population of bald eagles in central Arizona. The population of this endangered species may be affected by certain regulatory storage features of the CAP. Objectives of this study include the summarization of existing data and construction of a model to evaluate reproductive success, the determination of annual productivity and population trends, the determination of abundance and distribution of fish serving as prey for the eagles, the evaluation of the effects of human disturbance, the identification of prey, and the determination of movements of nesting adults via radio telemetry.

A cooperative study with the California Department of Fish and Game is currently underway to evaluate the effectiveness of windmill watering devices recently placed along the Coachella Canal. Providing water to desert mule deer at a site away from the canal may reduce a significant mortality problem. Preliminary indications are that the windmill drinkers are used by deer and other wildlife. Deer mortality in the Coachella Canal was lower during the 1982 dry season (late summer).

Work is nearing completion on an "Environmental Data System (EDS)" for the Lower Colorado River. EDS is a means of cataloging environmental data using a river mile location procedure on Reclamation's Cyber computer. Modules currently in use are vegetation community types and structures, wildlife (bird) species densities, and recreation. After a 1- to 2-year test period, a decision will be made whether or not to implement several other aquatic modules designed to be a part of an EDS.

Reclamation has recently initiated a 2-year aquatic study in the Yuma Division (Laguna Dam to Morelos Dam) of the Colorado River. The purpose of this study is to gather baseline data on selected physical and biological parameters which can be used to describe existing conditions in this reach of river. The information will be used in project planning, impact assessment, and as a base for post-project comparisons associated with the Yuma Division Flood Control Project. The control study is being completed by Arizona State University fishery biologists.

Power Operations

Lake Powell and Glen Canyon Dam.

Blue Mesa Powerplant.

Upper Basin-Colorado River Storage Project

During water year 1982, a significant effort was made to complete National Environmental Policy Act compliance for the proposed uprating of generators at Glen Canyon Powerplant. The proposed uprating of each of the eight generators from a maximum capacity of 143.75 megawatts (MW) to a maximum capacity of approximately 167.00 MW involves replacing or reinsulating field windings, strengthening rotor arms, and making minor mechanical modifications such as changing the fan assembly to increase airflow cooling.

In January 1982, a Draft Environmental Assessment for Glen Canyon Powerplant Uprating was circulated for public comment. Due to adverse response to this document, primarily from environmental groups and the river recreation community, Reclamation sponsored a river trip in the Grand Canyon during the period of May 24-27, 1982, to allow those people involved in, or those people who could be affected by, an uprating decision to observe firsthand some of the potential problems which were identified by those commenting on the Draft Environmental Assessment. It was concluded that Reclamation should initiate a cooperative study with the NPS to determine the impact of the present operation of Glen Canyon Powerplant on the Grand Canyon and to further assess various alternatives to the present operation. The results of this study will allow Reclamation to determine how best to use the additional capacity.

The final Environmental Assessment on the Glen Canyon Powerplant uprating is scheduled to be issued by December 1982; a decision as to whether to proceed with the uprating is expected to follow shortly thereafter.

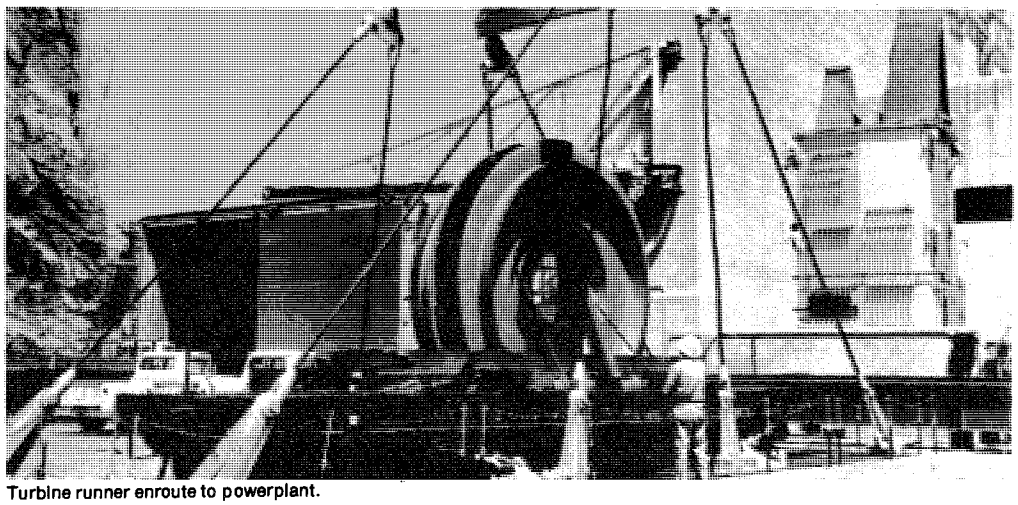
The following table summarizes the CRSP generation, purchases, disposition, and revenues from power operations for fiscal year 1982 and presents projections for fiscal year 1983.

The total revenue from power operations in fiscal year 1982 was $81,263,038. For fiscal year 1983, estimated revenues are $85,000,000.

Water Year 1982

Sources of Energy	
Net Generation	**Kilowatt-hours**
Flaming Gorge	433,017,000
Blue Mesa	184,471,000
Morrow Point	261,986,000
Fontenelle	62,550,500
Glen Canyon	3,881,478,000
Crystal	161,929,600
Subtotal-Net Generation	4,985,432,100
Purchases [for]	**Kilowatt-hours**
Parker Davis Firming	0
Rio Grande Firming	0
CRSP Firming	1,054,899,302
Fuel Replacement	871,992,698
Subtotal Purchases	1,926,892,000
Miscellaneous	
Transmission for others	243,451,000
Exchange	27,692,000
Power Deliveries from Others (Interchange)	792,000,000
Total Energy Receipts	7,975,467,100
Disposition of Energy	
Firm Energy Sales	5,597,152,591
Nonfirm Energy Sales	871,992,698
Power Delivered to Others (Interchange)	549,000,000
System Losses	957,321,811
Total Energy Distributed	7,975,467,100
Revenue	
Firm Energy Sales	$49,416,326.82
Nonfirm Energy Sales (Oil Conservation)	28,550,098.77
Parker Davis Firming	0
Wheeling for Others	2,621,401.49
Miscellaneous Income	675,211.35
Total Revenue	$81,263,038.43

Shelter from the blast, Granite Reef Aqueduct.

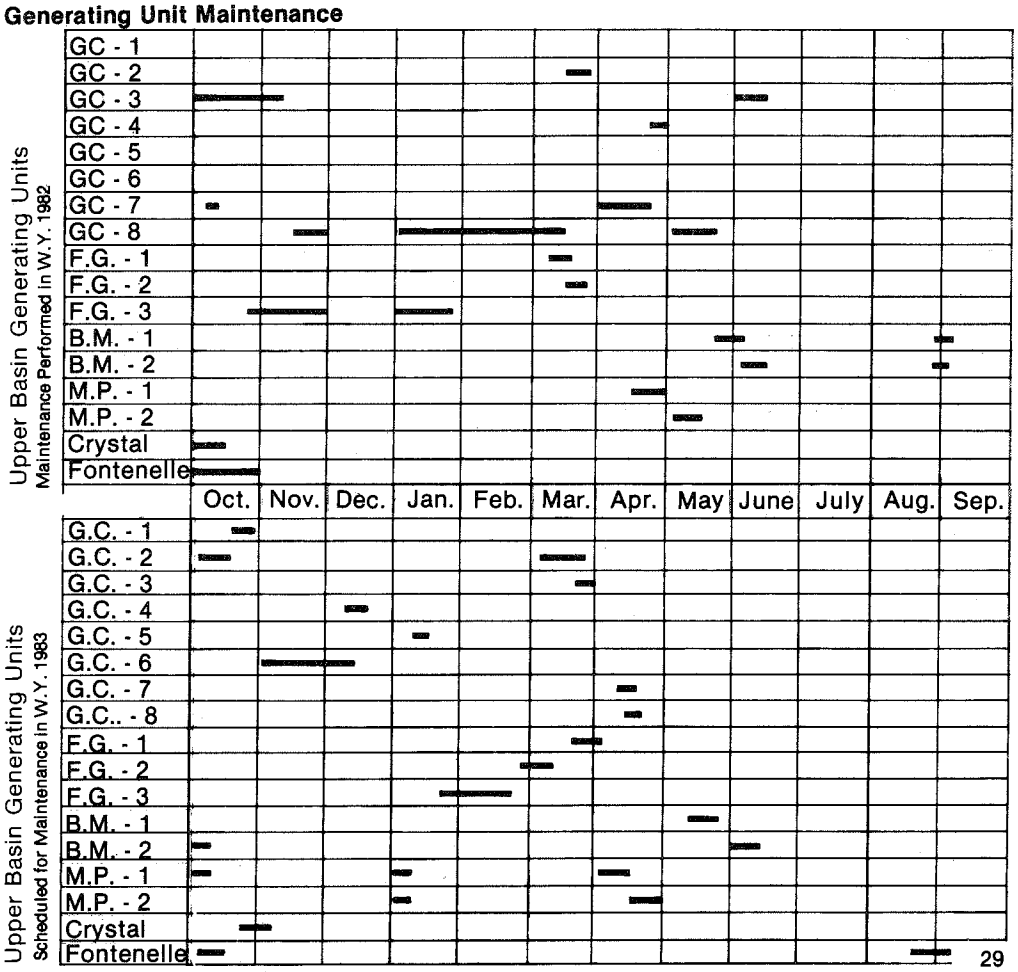


Turbine runner enroute to powerplant.

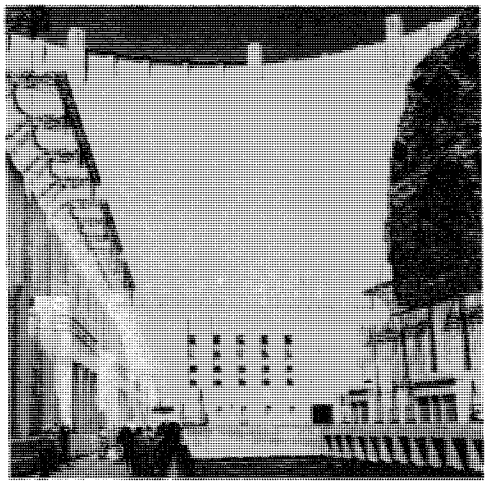
Water Year 1983 [Projected]

	Kilowatt-hours
Estimated Energy Sales	6,505,543,000
Estimated Purchases	2,000,000,000
Estimated Peaking Capacity Sales	
Winter 1982-83	40,000
Summer 1983	81,500
Estimated Revenue	$85,000,000

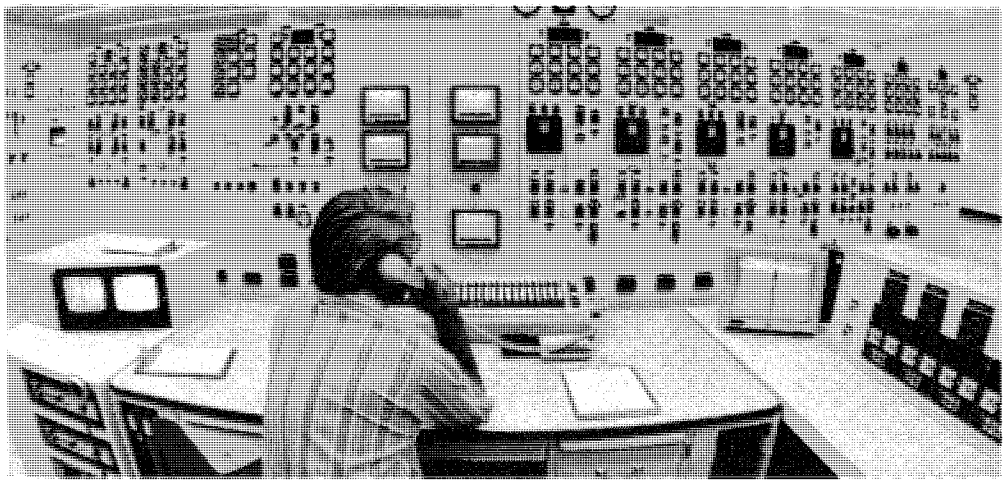
Generating Unit Maintenance



Power Operations [Cont.]



Hoover Dam and Powerplant.



Davis Dam control room.

Lower Basin - Water Year 1982
The total energy delivery to the Hoover allottees during the 1982 operating year (June 1, 1981 - May 31, 1982) was 3,562,610,052 kWh. There was no secondary or disputed energy delivered to the Hoover allottees during the operating year.

The remote control operation of Davis and Parker Powerplants began during water year 1982. These generator units are now computer operated from the Department of Energy's Phoenix Dispatch Office, using hourly gate opening and megawatt schedules input and modified by Reclamation's Water Scheduling Branch in Boulder City, Nevada.

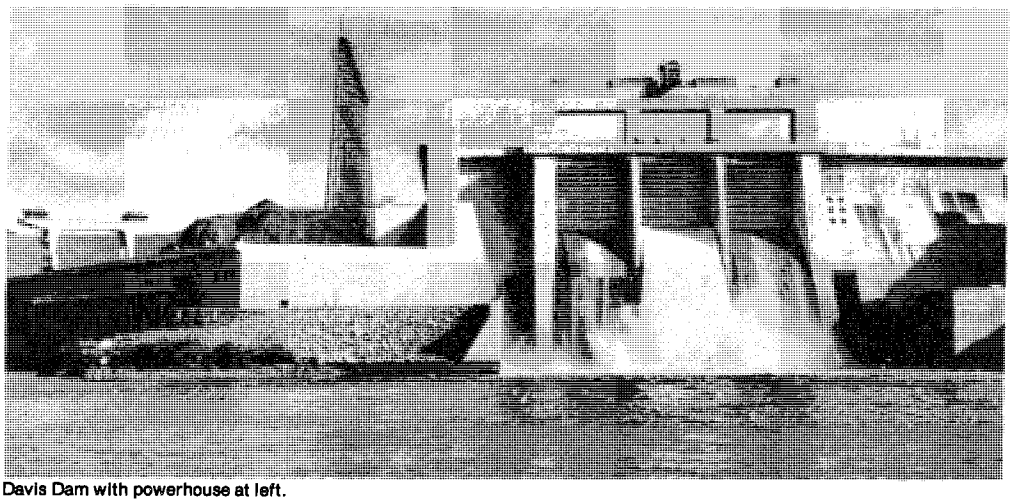
All scheduled periodic maintenance at Hoover, Parker, and Davis Powerplants was performed in water year 1982. Hoover's four water intake towers were inspected with an underwater television camera borrowed from Grand Coulee. The inspection showed that the structural integrity of the intake towers is sound. The uprating of Generating Unit A-5 was completed and Unit N-8 was rewound.

Water Year 1983
In operation studies of Lake Mead and Lake Powell for the Hoover operating year, which ends May 31, 1983, the amounts released at Hoover Dam have been projected to satisfy only minimum downstream water requirements, including diversions by MWD, while complying with the overall requirements to meet compact and operating criteria release provisions. The water scheduled to be released will generate about 83.2 percent of defined firm energy. The estimated monthly Hoover releases during the operating year total 7.5 million acre-feet. It is estimated that generation from these Hoover releases, along with the Hoover to Parker-Davis interchange, will result in delivery to the allottees of about 3.3 billion kWh of electrical energy.

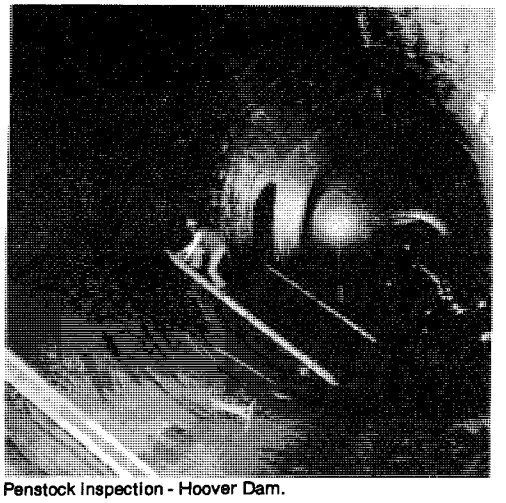
The lower Nevada penstock is scheduled for reconditioning during water year 1983. Also scheduled this year is the uprating of Generating Unit N-7 and the replacement of turbine runners in Units A-6 and N-5.

Unit 2 at Davis Dam damaged its lower guide bearing twice last year. A major overhaul of the thrust bearing support was conducted along with realinement of the unit. This unit was scheduled to go back on line the first part of this water year.

The following charts illustrate Lower Basin generator unit outage schedules for water year 1982 and water year 1983.



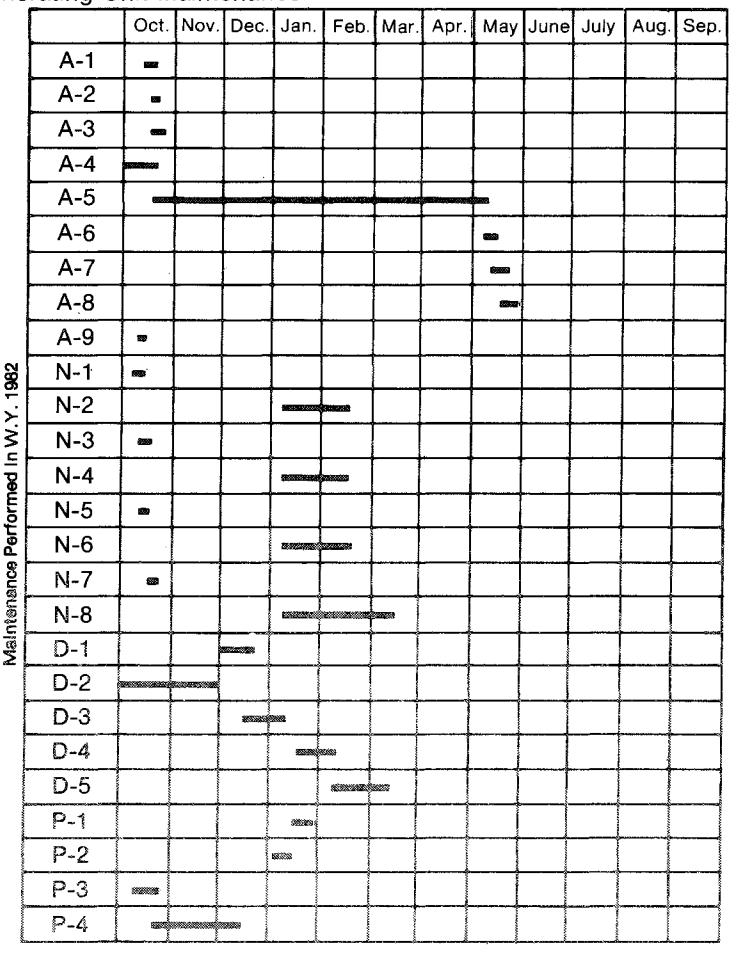
Davis Dam with powerhouse at left.



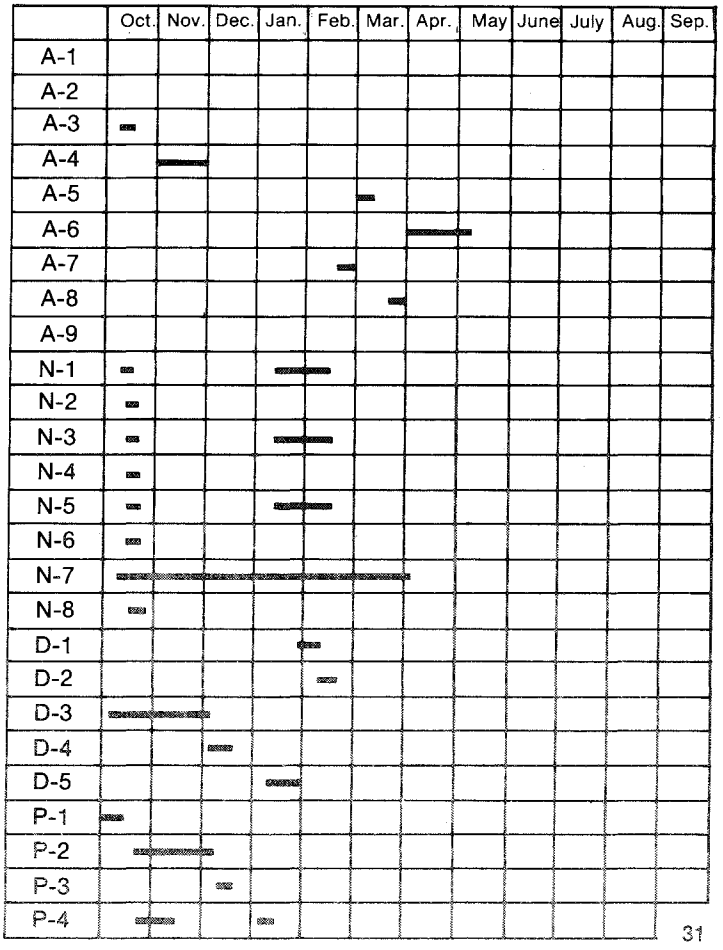
Penstock Inspection - Hoover Dam.

Generating Unit Maintenance

Lower Basin Generating Units
Maintenance Performed in W.Y. 1982



Lower Basin Generating Units
Scheduled for Maintenance in W.Y. 1983



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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.